ACMS American College of Mohs Surgery

Phoenix
ARIZONA

46th Mohs College Annual Meeting

MAY 1–4, 2014 · JW MARRIOTT DESERT RIDGE

This activity is jointly sponsored by ACMS & IAHB

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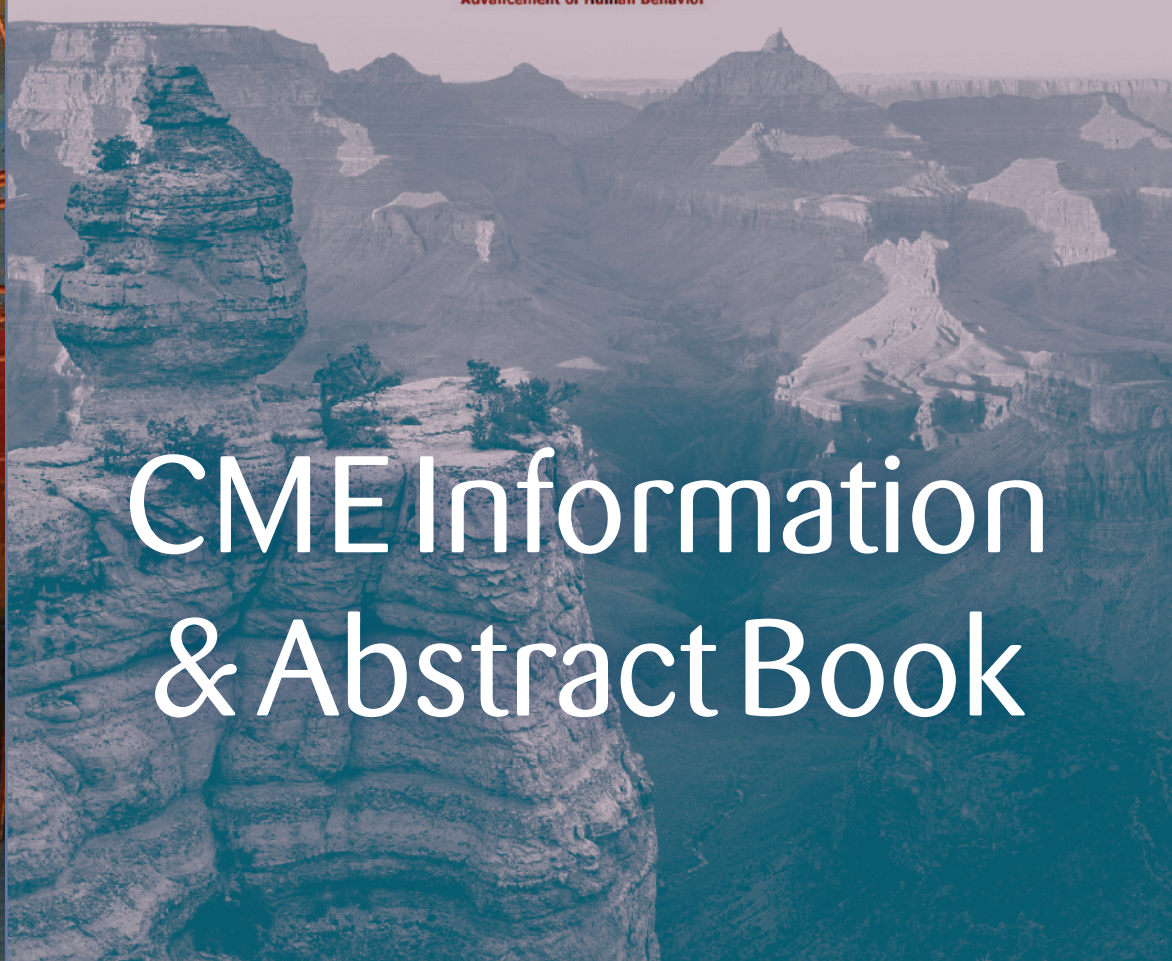

CME Information & Abstract Book

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ACMS American College of Mohs Surgery

Photos courtesy of the Phoenix Convention & Visitors Bureau and JW Marriott Desert Ridge

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Locate the (ACMS) American College of Mohs Surgery listing and select "2014 Mohs College Annual Meeting" event. On the site, **you will be asked to enter the password MC14** and evaluate various aspects of the program (participants must complete an attendance/evaluation form in order to receive a certificate of completion/attendance. Your chosen sessions must be attended in their entirety. Partial credit of individual sessions is not available). Your hours will be automatically calculated.

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IMPORTANT!

The online certificate site will be available the end of the day May 4, 2014 through June 14, 2014. After that date, the site will be removed and certificates will no longer be available. If you need a CME / CE certificate, you must complete the evaluation and certificate process prior to that date; otherwise you will forfeit your credit for the course.

Please direct any questions regarding the process to: Sheryl Morgan at sheryl@amedcoemail.com; (651) 789-3730.

CME Information

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Please complete the MOC Credit Form, available in 'MOC Self-Assessment: Skin Cancer' (25 question credits) or 'MOC Self-Assessment: Office Safety' (25 question credits) on Sunday, May 4, 2014, 11:00 AM-12:30 PM, and return to the ACMS Registration Desk or a drop-box. You must update your American Board of Dermatology MOC tables to reflect the 25 question credits available for the session you attend.

The completion of the self-assessment exercise satisfies a portion of the self-Assessment module of Component 2 in MOC. CME credits cannot be claimed for MOC sessions.

Note: If you claimed MOC credits for 'Get your MOC Here! Maintenance of Certification for Skin Cancer' at the 2013 Regional Meeting, you cannot claim MOC credits for 'MOC: Skin Cancer' at the 2014 Annual Meeting.

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Faculty Disclosure Information

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Tromovitch Award Abstract Session – Thursday, May 1: 10:00 – 11:00 am

10:00 – 10:07 AM

PRESENTER: Bichchau Michelle Thi Nguyen, MD

TITLE: Impact of 2010 NCCN Guidelines on Utilization and Effectiveness of Sentinel Lymph Node Biopsy in Thin Melanoma

AUTHORS: Bichchau Michelle Thi Nguyen, MD[1]; Pritesh Karia, MPH[1]; Victoria Hills , BS[2]; Chrysalyne D. Schmults, MD, MSCE[1]

INSTITUTIONS: 1. Brigham & Women's Hospital, Department of Dermatology, Jamaica Plain, MA, United States 2. Brigham & Women's Faulkner Hospital, Jamaica Plain, MA, United States

PURPOSE: In 2010, NCCN started recommending SLNB for T1b melanoma i.e. Breslow depth < 1mm with mitotic index ≥1 or ulceration. Few studies examined the impact of these guidelines on the utilization of SLNB in thin melanoma. Moreover, it is unclear whether the guidelines effectively risk-stratify thin melanomas for SLNB. To answer these questions, we compared the rates of SLNB and positive sentinel node in thin melanomas in the 10 years before (2000-2009, n=859) and 2 years after (2011-2012, n=188) implementation of NCCN v.2010. We also retroactively staged the 2000-2009 cohort based on the NCCN v.2010 guidelines and compared risks of nodal metastasis, distant metastasis and melanoma death across tumor groups.

SUMMARY: After implementation of NCCN v.2010, rate of SLNB in thin melanoma increased from 17% (142/859) to 35% (66/188), and from 45% (75/167) to 83% (57/69) in T1b tumors. Proportion of positive sentinel node increased from 5% (7/142) to 8% (5/66). Proportions of positive sentinel node for T1b tumors, T1b ≥ 0.75mm, and T1b < 0.75mm were 8.7%, 14% and 3% for the 2011-2012 cohort. No positive sentinel node was detected in T1a tumors. Outcomes were analyzed for the 2000-2009 cohort with median follow-up of 79 months. Risks of nodal metastasis for T1b ≥ 0.75mm, T1b < 0.75mm, T1a ≥ 0.75mm, T1a < 0.75mm with lymphovascular invasion or Clark IV or higher, and T1a without any adverse features were 18%, 3%, 5%, 1% and 0.5%. T1b ≥ 0.75mm had significantly higher risks of distant metastasis (6% vs. 2%), melanoma death (7% vs. 4%) and adverse outcome (24% vs. 6%) compared to T1b < 0.75mm. SLNB was associated with decreased risk of nodal metastasis only in T1b ≥ 0.75mm (HR 0.1, 0.03-0.42), and not in any other tumor subgroup or entire cohort.

DESIGN: The study is a retrospective single institution analysis of thin melanomas diagnosed from 2000-2009, and 2011-2012. Rates of SLNB and proportion of positive sentinel node across tumor risk groups and between the two cohorts were compared using t-test. Outcomes across tumor groups were compared using Fisher's exact and chi-square statistics. Impact of SLNB on risk of nodal metastasis was assessed using i) multivariate analysis of factors contributing to nodal metastasis in each tumor group, and ii) log rank test of Kaplan Meier curves for nodal metastasis in patients with and without SLNB in each tumor group.

CONCLUSION: Implementation of NCCNv.2010 led to increased utilization of SLNB in thin melanoma, especially in T1b tumors. T1b ≥ 0.75mm had the highest risks of positive sentinel node, nodal metastasis, distant metastasis, melanoma death and any adverse outcomes. SLNB was associated with decreased risk of future nodal metastasis only in T1b ≥ 0.75mm. Overall, SLNB is most beneficial for T1b ≥ 0.75mm.

10:07 – 10:14 AM

PRESENTER: Mac Machan, MD

TITLE: Effectiveness and Advantages of On-site Pathology Services in the Care of Skin Cancer Patients

AUTHORS: Mac Machan, MD[1]; David G. Brodland, MD[1]

INSTITUTION: 1. Zitelli & Brodland, PC, Pittsburgh, PA, United States

PURPOSE: The United States Government Accountability Office (GAO) issued a report in June 2013 entitled "Action Needed to Address Higher Use of Anatomic Pathology Services by Providers Who Self-Refer," which suggests that practitioners with in-house/on-site pathology labs do "unnecessary" biopsies simply for the financial benefit. Because of this report a bill (H.R. 2914) has been drafted by congress that would repeal some of the liberties granted under the Stark Rule for ancillary in-office services (such as pathology). We anticipate important practice management questions arising in conjunction with this issue and foresee data deficiencies that will be needed to clarify these questions. We aim to assess the effectiveness and advantages of on-site (in-office) pathology services in the care of skin cancer patients by addressing the following gaps in clinical evidence: 1) clinical accuracy of lesional biopsies in identifying malignancies at multiple sites with in-house pathology services, 2) comparing surgical site infections for "same day" versus "later-date" excision of malignancies, and 3) patient satisfaction regarding incurred costs (i.e. lost time at work, travel time/cost, etc.) or inconvenience in the "later-date" group.

SUMMARY: At 8 sites with on-site pathology services, 1052/1379 of biopsies performed demonstrated a malignancy, resulting in a 76.3% rate of critically relevant diagnoses. Twenty-four surgical site infections were documented in 2012 in 2693 cases at the main site. 3 infections (0.4%) occurred in the 719 patients who had biopsy and definitive excision on the same day, while 21 infections (1.1%) occurred in 1974 patients who had biopsy at a date prior to surgery (p = .162). In the "later-date" group, 24/156 respondents incurred additional costs and 24/148 had a relative/friend who was inconvenienced.

DESIGN: After WIRB approval (study #: 1143694), clinical accuracy and, by proxy, appropriateness of biopsies at 8 sites with on-site pathology services was reviewed. Each site contributed 10 working days of biopsy data from July 2013. Biopsies of inflammatory dermatoses were excluded. Second, the surgical site infection log at the main site (Zitelli & Brodland) was reviewed for the calendar year 2012 to compare two biopsy and treatment scenarios ("same day" vs. "later-date"). Third, a patient satisfaction questionnaire was administered as patients waited between Mohs layers and closure at the main site.

CONCLUSION: On-site pathology services are efficient and effective in the care of skin cancer patients. The clinical accuracy rate for critical, clinically relevant diagnoses of 76.3% is in accordance with previous studies by Sellheyer et al (76.2%) and Ek et al (70.3%), and dispels the notion that "unnecessary" biopsies are performed when on-site pathology services are available in the setting of Mohs surgery. The patient also appears to benefit from same day biopsy and excision as evidenced by significantly fewer surgical site infections in that patient group as shown in our study. There is a significant group of patients (16%) who were inconvenienced or felt that it would be significantly more convenient to have biopsy and treatment on the same day. Reasons provided include cost of transportation/lodging, and lost days at work for the patient, friend and/or relative. Most Mohs surgeons recognize the advantages of seeing the lesion clinically and histologically in making a diagnosis. Additionally, we surmise that other inherent advantages of same day biopsy and treatment are fewer wrong-site surgeries, and possibly smaller surgical defects which may result in less complex and more cosmetically appealing repair options.

10:14 – 10:21 AM

PRESENTER: Cameron Chesnut, MD

TITLE: Quantitative Molecular Profiling of Squamous Cell Carcinomas from Organ Transplant Patients and Immunocompetent Patients

AUTHORS: Cameron Chesnut, MD[1]; Philip O. Scumpia, MD, PhD[2]; Nima M. Gharavi, MD, PhD[2]; Gary P. Lask, MD[1]; Rajan P. Kulkarni, MD, PhD[2]; Teresa T. Soriano, MD[2]

INSTITUTIONS: 1. University of California, Los Angeles, Dermatologic Surgery, Los Angeles, CA, United States 2. University of California, Los Angeles, Medicine/ Dermatology, Los Angeles, CA, United States

PURPOSE: Cutaneous squamous cell carcinomas (SCCs) represent a large burden on organ transplant recipients. Many SCCs in organ transplant recipients have features giving them a higher likelihood of metastasis. Our understanding of the molecular pathogenesis of high-risk cutaneous squamous cell carcinomas (SCCs) is not completely understood. We hypothesize that by using RNA sequencing - a high throughput technique to obtain quantitative gene expression analysis - we will be able to identify whether SCCs from organ transplant recipients behave differently than those from healthy controls, and whether novel pathways can be identified which can be exploited for future targeted therapies.

SUMMARY: We found that over 690 highly expressed genes were induced 5-fold or more in SCCs from organ transplant recipients over otherwise healthy patients. Ingenuity Pathway Analysis showed the pathways induced in organ transplant recipients include fibrosis pathways, extracellular remodeling pathways, cell cycle, and tumor signaling pathways. 1290 highly expressed genes were inhibited 5-fold or more in SCCs from organ transplant recipients. Of the genes that were inhibited in SCCs from transplant patients, sterol biosynthesis pathways and epithelial differentiation pathways were the most strongly inhibited, followed by nucleotide excision repair pathways, Interleukin (IL)-6 and IL-17 pathways, and finally apoptosis signaling. Of note, tp53 the gene encoding p53, was decreased in SCCs from organ transplant patients.

DESIGN: The central portion of SCCs that were undergoing Mohs surgery was removed and snap frozen in liquid nitrogen. These were then stored at -80 degrees Celsius until ready for processing. Samples were processed by the university's Microarray Core, and RNA Sequencing libraries were generated. Highly induced genes were included in analysis if the Reads per kilobase transcript per million reads (RPKM) were greater than 5. Ingenuity Pathway Analysis was performed on the gene lists to identify pathways regulated within the tumors.

CONCLUSION: In conclusion, we find that tumors from organ transplant recipients display a more aggressive molecular phenotype with activation of pathways resulting in cancer signaling, fibrosis, and extracellular matrix. Importantly, the tp53 gene was expressed at decreased levels in transplant patients' SCCs when compared to SCCs from non-immunosuppressed patients. Gene pathways that were decreased in SCCs in transplant patients include epithelial differentiation pathways, tumor repair pathways and, expectedly, immune activation pathways. These findings suggest that RNA Sequencing can be used to identify pathways regulated in higher risk SCC, and identify novel therapeutics that can be used to target specific pathways in more aggressive SCCs from organ transplant recipients.

10:21 – 10:28 AM

PRESENTER: Vanessa C. Lichon, MD

TITLE: Rotation Flap Design and Tension Vectors: An In Vivo Experiment in a Pig Model

AUTHORS: Vanessa C. Lichon, MD[1]; Glenn D. Goldman, MD[1]

INSTITUTION: 1. Fletcher Allen Health Care, Burlington, VT, United States

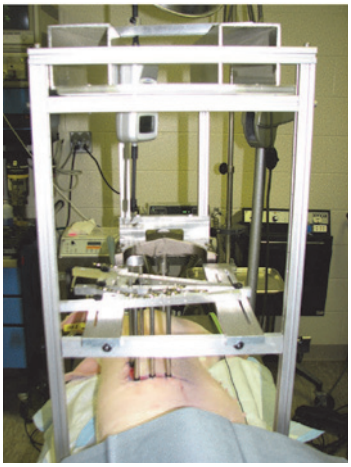
PURPOSE: The leading edge of a rotation flap may fall short of its target. Lengthening the leading edge of a rotation flap has been felt to decrease closure tension of the primary motion. A recent neoprene model study in the Plastic Surgery literature called this into question. We felt that the study was flawed, and we designed an in vivo pig model to study closure tensions based on design variations of the standard rotation flap. Prior studies of flap tension vectors have only measured closure forces by pulling on the flap itself, rather than by measuring tension across the wound (components of tension come from both sides). We felt that designing an accurate tension measuring apparatus and employing this in an in vivo model would confirm our hypothesis that leading edge elongation does aid in rotation flap closure.

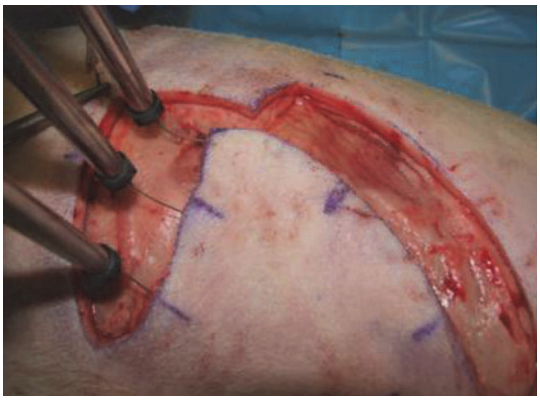
SUMMARY: Twenty five operations were undertaken successfully. Thirteen standard rotation flaps and twelve modified rotation flaps were elevated and undermined. In each case the closure tensions were measured and

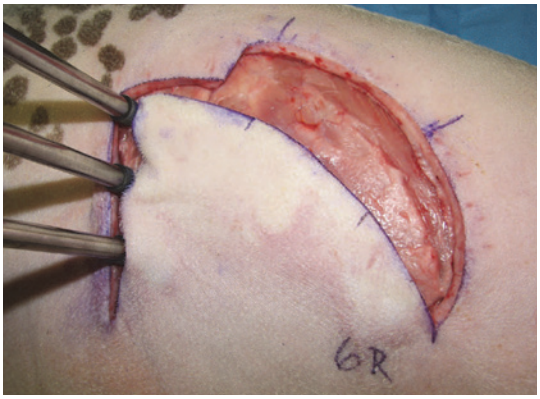
collated. Closure tensions at various points along the flap measured up to 3 lbs, and in our model, secondary defect closure tensions were slightly higher than closure tensions in the primary motion of the flap. The key finding was that closure of the tip of the flap required 2.02 + 0.62 lbs of force in the standard flap, and 1.24 + 0.52 lbs of force in the flap with the elongated leading edge. This was a highly significant difference with a p value of 0.0025. Secondary closure tension was unaffected.

DESIGN: Animal IRB approval was obtained for 16 pigs using a statistical power analysis. A special tension measuring apparatus was designed and constructed with the assistance of our engineering and mechanical division. This allowed for the measurement of tension across the advancing margin of the flap using accurate digital tension meters. Instead of just pulling on the flap, the apparatus allowed for accurate tension measurement across the wound. Each pig was place under general anesthesia, and in a formal animal operating facility the experiments were carried out under the auspices of our animal research facility. Flaps were designed either using a standard rotation flap or with a leading edge which was elongated 20%. The flaps were incised, elevated, and undermined, and then tensions were measured at multiple standard points along the flap closure of the primary and secondary defects. Following completion of our surgery, the pigs were used in other experiments in cooperation with other departments at our institution, and then they were euthanized.

CONCLUSION: Elongating the leading edge of a rotation flap reliably decreases closure tension in the direction of primary motion. Closure tension of the secondary defect is not affected in a statistically significant manner.







10:28 – 10:35 AM

PRESENTER: Erik S. Cabral, MD

TITLE: A Novel Three-dimensional Imaging Method for Skin Cancer Invasion

AUTHORS: Erik S. Cabral, MD[1]; Rajan P. Kulkarni, MD, PhD[2]; Richard G. Bennett, MD[1,3]

INSTITUTIONS: 1.Bennett Surgical Center, Santa Monica, CA, United States 2. University of California, Los Angeles, Los Angeles, CA, United States 3. David Geffen School of Medicine at UCLA, Los Angeles, CA, United States

PURPOSE: We have developed a new approach for generating 3-D images to map pathways of skin cancer progression using a significant modification of the CLARITY (Clear Lipid-exchanged Acrylamide-hybridized Rigid Imaging/Immunostaining/In situ hybridization-compatible Tissue-hydrogel) method. Novel tissue processing methods for preserving skin cancers in 3-D can be utilized for heightened understanding of tumor invasion and for identifying cells with increased malignant potential to isolate them for further immunohistochemical (IHC) analysis. This approach utilizes fresh tissue blocks obtained at time of Mohs surgery. CLARITY-prepared tissue is optically clear (Figure 1) for better visualization and can be directly imaged or used for IHC (Figures 2&3) to reveal the complex heterogeneity of skin neoplasia.

SUMMARY: We have successfully adapted the CLARITY method for visualization of basal cell carcinoma (BCC) invasion of tissue. Acridine orange staining highlights the

nuclear structure of each cell to generate 3-D image stacks of BCC. We can image to a depth of at least 2 mm and generate depth-coded reconstructions of tumor islands and clusters, as well as tumor margins (Figure 2). We have also utilized cytokeratin antibodies (AE1/AE3) for IHC within the BCC (Figure 3). Additional studies are underway to further employ IHC to identify cells of interest (BerEp4) as well as important structures such as perineual invasion (CK5/6+S100), lymphatics (D2-40) and angioinvasion (CD31) with CLARITY.

DESIGN: The CLARITY approach is a novel method for generating optically clear tissue hydrogels of cancer tissues. Fresh tissues are fixed in paraformaldehyde 1% to enable cross-linking of proteins, nucleic acids, and subcellular structures and then acrylamide monomer is infused. The monomer is then polymerized to create a hydrogel surrounding the cancer cells. The lipids are not cross-linked and can be cleared using sodium dodecyl sulfate detergent. Clearing the lipids enables optical clarity; lipids scatter light and prevent transparency. Indeed, one major reason that sectioning is traditionally required is due to light scattering by lipids in the tissue. By removing those lipids, our approach with CLARITY obviates the requirement for sectioning.

CONCLUSION: The CLARITY method enables analysis of entire skin cancers in 3-D. This method will be critical for improving understanding of the 3-D architecture of skin neoplasia and improves identification of tumor initiating cells in the tumor microenvironment. We can identify tumor progression, margins and relationship to important cellular structures such as perineural invasion. Additional advances will allow for efficient tissue processing and may enable such methodologies to be utilized in limited resource settings, thus expanding the reach of Mohs surgery and allowing for improved margin control and resection of cutaneous tumors for better clinical outcomes.

Figure 1. Photo of transparent BCC tissue (right) compared to the same non-cleared tissue (left).

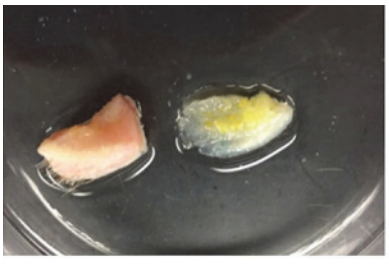


Figure 2. Depth-coded fluorescent microscopic image of optically transparent BCC tissue cleared using CLARITY and stained with acridine orange. The colors indicate depth of tumor cells in the tissue, with blue being deepest.

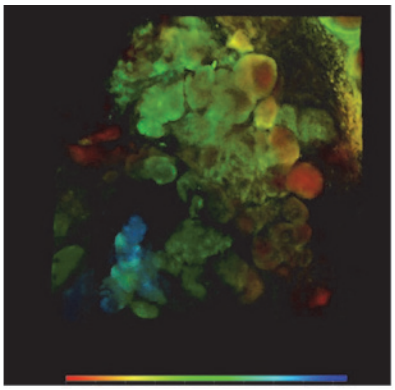
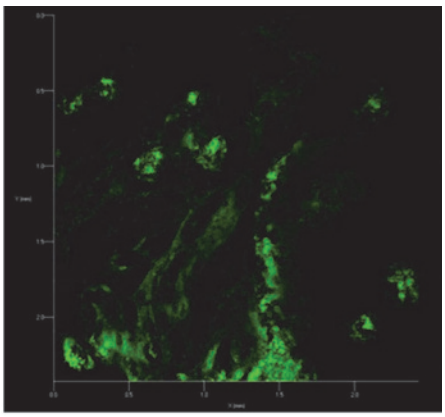


Figure 3. Fluorescence micrograph of optically transparent BCC tissue stained with anti-cytokeratin antibodies (AE1/AE3). Individual cancer cells can be identified with the immunostain.



10:35 – 10:42 AM

PRESENTER: Laurel A. Leithauser, MD

TITLE: **Histologic Risk Factors for Recurrence of Non-melanoma Skin Cancer Following Mohs Micrographic Surgery**

AUTHORS: Laurel A. Leithauser, MD[1]; Tonja Godsey, BS[2]; Hugh M. Gloster, Jr., MD[2]

INSTITUTIONS: 1. University of Cincinnati, Cincinnati, OH, United States 2. University of Cincinnati, College of Medicine, Cincinnati, OH, United States

PURPOSE: Compared with standard surgical excision, intra-operative evaluation of frozen sections during Mohs micrographic surgery (MMS) provides superior cure rates for non-melanoma skin cancer (NMSC). While cure rates of NMSC approach 99% with MMS, local recurrences occasionally occur. We sought to identify histologic features associated with local recurrence of NMSC following MMS.

SUMMARY: Of 2,799 NMSCs treated during the study period, 20 were locally recurrent. Possible causes of local

recurrence were identified in 85% of cases. Histologic abnormalities suggestive of missed residual tumor included dense inflammation in the final margin at sites affected by tumor in prior slides (30%), visible remaining tumor cells (25%), missing epidermal or dermal tissue (18%) and hypertrophic actinic keratosis (5%). One recurrence was possibly explained by incorrect mapping. No abnormality could be detected in 15% of cases. As expected, squamous cell carcinomas (SCCs) were more likely to recur than other types of NMSC, with SCCs representing 15/20 (75%) of recurrent tumors.

DESIGN: We performed a retrospective chart review of patients undergoing a second MMS procedure to treat locally recurrent NMSC at the university over a 17 month period (October 2012- February 2014). Inclusion criteria included the following: initial and recurrent NMSC lesion treated with MMS by the same surgeon and technician, local recurrence occurring within 5 years of original MMS, and photographic confirmation of tumor site. Histologic slides from each tumor were reviewed to assess for possible causes of local recurrence.

CONCLUSION: Local recurrences following MMS are extremely rare. When recurrences do occur, they can sometimes be attributed to errors in histologic interpretation or tumor mapping. To avoid recurrences, every effort should be made to produce accurate maps and high quality frozen sections without missing epidermis or dermis. In addition, the surgeon should carefully examine frozen sections for residual tumor and consider taking additional layers in areas of dense inflammation. Residual actinic keratosis should be taken seriously and treated with appropriate measures such as liquid nitrogen or topical chemotherapy.

10:42 – 10:49 AM

PRESENTER: Kimberly L. Brady, MD

TITLE: Sebaceous Carcinoma: A Retrospective Chart Review of Cases

AUTHORS: Kimberly L. Brady, MD[1]; Eva A Hurst, MD[1]

INSTITUTION: 1. Washington University, Center for Dermatologic and Cosmetic Surgery, St. Louis, MO, United States

PURPOSE: Sebaceous carcinoma is a rare and potentially aggressive adnexal neoplasm, and areas with a higher density of sebaceous glands (eyelids, face, scalp, and neck) have a higher incidence. Sebaceous carcinoma has the potential to metastasize; the most common sites are regional lymph nodes, and distant metastasis occurs less frequently. Reported rates of local recurrence and metastasis vary with local recurrence being reported in up to 37%, and metastasis in up to 28%. Cancer-specific mortality has been reported as high as 30%. In our experience, we have not observed rates this high. Also, because sebaceous carcinoma is a rare tumor, there are no standard guidelines regarding workup or imaging. We performed a retrospective chart review to assess the incidence of local recurrence, metastasis, disease-specific mortality, and all-cause mortality, in addition to the treatment modality and the diagnostic work-up.

SUMMARY: Between 2001 and 2013, a total of 37 patients with 45 sebaceous carcinomas were treated. Patient and tumor characteristics are shown in Tables 1 and 2. Work-up for patients with sebaceous carcinoma without a history of MTS is presented in Figure 1. Twelve tumors had mismatch gene repair (MLH1, MSH2, MSH6, and PMS2) immunohistochemical staining performed, of which 12 tumors showed loss of expression of ≥1 gene. One patient with two tumors showing loss of both MLH1 and MSH6 subsequently had genetic testing consistent with Muir Torre Syndrome (MTS). Forty-four tumors were treated with Mohs micrographic surgery (MMS), and one was treated with staged excision. In 8 cases, a final stage was sent for permanent histologic sections after MMS for confirmation of tumor clearance. No patients had local recurrences or metastases over an average follow-up of 1.6 years. Per medical records, 3 patients were deceased, and no death was attributed to sebaceous carcinoma.

DESIGN: A retrospective chart review of all patients with sebaceous carcinoma at one institution between 2001 to 2013 was performed to determine patient management and rates of metastasis, local recurrence, disease-specific death, and all-cause death. Patient and tumor characteristics were also collected. This study was approved by the Institutional Review Board and the Protocol Review and Monitoring Committee.

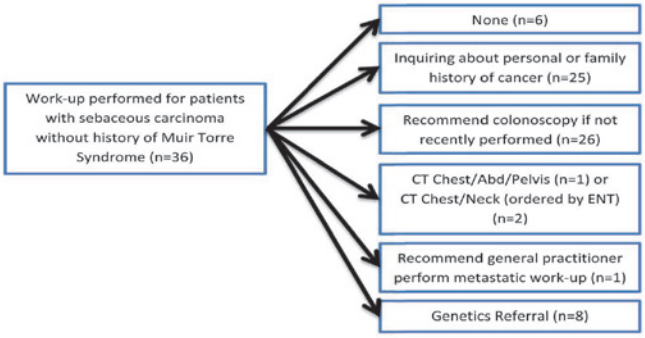
CONCLUSION: We present 45 cases of sebaceous carcinoma. The age distribution is comparable to that in the literature. However, our patients were predominantly male and the majority was white, which is contradictory to previous reports that suggest a female predominance and a predilection for Asians to develop sebaceous carcinomas. None of our patients had local recurrence or metastasis, which supports MMS as an effective treatment. Patients should be questioned regarding personal and family cancer histories, as well as routine cancer screening. Immunohistochemical staining with MLH1, MSH2, MSH6, or PMS2 is also helpful in identifying which patients should be referred to a geneticist for workup of MTS.

Table 1. Patient Characteristics

Patients – no.	37	
Tumors – no.	45	
Age – years	Average	67.1
	Median	67
	Range	36-95
Sex – no. (%)	Male	24 (65%)
	Female	13 (35%)
Race – no. (%)	White	35 (95%)
	African American	1 (3%)
	Indian	1 (3%)
Diagnosis of Muir Torre Syndrome – no. (%)	Confirmed with genetic testing	3 (8%)
	Patient reported history	2 (5%)

Table 2. Tumor Characteristics		
Tumor Status – no. (%)	Primary	45 (100%)
	Incompletely excised	1 (2%)
Locations – no. (%)	Periocular	6 (13%)
	Face, excluding periocular	21 (47%)
	Scalp	3 (7%)
	Neck	2 (4%)
	Trunk	4 (9%)
	Extremities	9 (20%)
Duration prior to treatment	Average	18 months
	Median	5 months
	Range	1 month – 20 years
Pre-operative Size	Average	0.7 cm^2

Figure 1.



10:49 – 10:56 AM

PRESENTER: Eugene Tan, MBChB, FRACP, FNZDS

TITLE: **Growth of Peri-ocular Basal Cell Carcinoma – The Impact of Waiting Time for Elective Surgery**

AUTHORS: Eugene Tan, MBChB, FRACP, FNZDS[1]; Stephen Ng, MBChB, FRACO[2]; Paul Salmon, MBChB, FRACP, FACMS[1]; Neil Mortimer, MBChB, MRCP, FACMS[1]; Frank Lin, MBChB, PhD[2]; Leo Sheck, MBChB[2]

INSTITUTIONS: 1. Skin Cancer Institute, Tauranga, Bay of Plenty, New Zealand 2. Waikato Hospital, Hamilton, Waikato, New Zealand

PURPOSE: To measure the growth rate and assess the impact of waiting time on the growth of peri-ocular BCC. The main aim was to determine if the change in size affects the type of reconstructive surgery and its complexity.

SUMMARY: A total of 112 patients and 116 peri-ocular BCCs were seen. The primary ethnicity was European with predominantly Fitzpatrick Type I and II skin type (Type I = 41, Type II = 74). The mean size of the BCC was 0.8 x 0.6 mm (range: 6-12 x 4-8 mm) with a mean area of 69.3 mm2. The average waiting time for tumour excision was 157 ± 87 days for the tertiary hospital and 116 ± 107 days for the private clinic. Peri-ocular BCCs grew at a rate of 11.2mm2 per 30-days. From the time of FSA to the time of surgery, a mean increase of 41.9mm2 was observed. The difference in operating times in the tertiary hospital compared to the private clinic resulted in a mean change of 15.3mm2 (95% C.I. -53.9—76.0 mm2) in growth of BCC and more complex reconstructive surgery required. Recurrent tumours, aggressive histologic subtypes, larger tumours at presentation and male sex were associated with a faster growth.

DESIGN: A prospective longitudinal study over 2 years. Patients referred to an oculoplastic service at two locations (tertiary hospital and a private clinic) for excision of peri-ocular BCC were recruited. Location and dimensions of the BCC were recorded at first specialist appointment (FSA). Macroscopic and dermoscopic images were also obtained to better delineate the margins. A proposed surgical excision and reconstruction was recorded. Patients were then referred for Mohs Micrographic Surgery where measurements were repeated and Mohs defect size recorded. Reconstruction was then performed at the oculoplastic service. The size of the BCC and complexity of reconstructive surgery were compared to data obtained at FSA. For rapidly-growing BCCs, correlation analyses were performed to determine if any histological subtype or patient related factors predicted faster growth. (Ethics Approval no: HREC - NTY/10/EXP/024, Clinical Trial no. ACTRN12610000542099)

CONCLUSION: Basal cell carcinomas in the peri-ocular region can grow at a fast rate and this growth affects complexity of reconstruction and morbidity. These individuals often have features that are identifiable at FSA allowing them to be prioritized for surgery on an urgent basis.

2:15 – 2:22 PM

PRESENTER: Carl Vinciullo, MB, BS, FACD

TITLE: Antimicrobial Stewardship in Mohs Surgery: An Evidence Based Approach Utilising Targeted Topical Decolonization

AUTHOR: Carl Vinciullo, MB, BS, FACD[1,2]

INSTITUTIONS: 1. Oxford Day Surgery and Dermatology, Mount Hawthorn, West Australia, Australia 2. University of Western Australia, Crawley, West Australia, Australia

PURPOSE: Stratify patient risk for surgical site infection (SSI) according to preoperative nasal carriage of staphylococcus aureus. Determine whether topical decolonization reduces SSI Determine whether oral antibiotic prophylaxis is effective when compared to topical decolonization Reduce antibiotic overuse in Mohs surgery

SUMMARY: The relative risk (RR) of surgical site infection in nasal carriers of staphylococcus aureus versus non-carriers is 3.4 (p=0.001) irrespective of surgical site, surgical defect size, type of reconstruction or associated medical co-morbidity. Carriers were randomized to either 5 days of pre-operative topical decolonization with intranasal mupirocin ointment and full face and body 4% chlorhexidine gluconate wash or no treatment. The RR of SSI in decolonized carriers versus non-decolonized carriers is 0.3 (p=0.05). The RR of infection in a decolonized carrier versus a non carrier is 1.2 (Figure 1). The use of oral antibiotic prophylaxis with 2g cephalexin pre-operatively and 1g 6 hours post operatively in nasal carriers of staphylococcus aureus is ineffective at reducing SSI following Mohs surgery (9% infection rate) when compared to 5 days of topical decolonization (0% infection rate) (p=0.003) (Figure 2).

DESIGN: Prospective randomized controlled trial All Mohs patients have preoperative nasal swabs for staphylococcus aureus Swab positive prospectively randomized to topical decolonization or no intervention Swab positive in second study randomized to topical decolonization or oral antibiotic prophylaxis Swab negative in third study randomized to topical decolonization or no intervention

CONCLUSION: In these studies, patient risk of SSI is stratified according to nasal carriage of staphylococcus aureus (25-30% of all patients). In previously published reports endogenous carriage of staphylococcus aureus has been shown to be the source of SSI in up to 85% of cases. Patients with negative nasal swabs were not immune to infection as endogenous staphylococcus aureus is carried in other sites such as the oropharynx, flexures, web spaces, groin and perineum which has the potential to lead to colonization of wounds and SSI. The background SSI rate in non- carriers of staphylococcus aureus reported in these studies varies between 3-6%. This is within the accepted range for SSI (<10%) for clean-contaminated surgery. Further research currently underway will establish whether topical decolonization reduces SSI rates in nasal non-carriers of staphylococcus aureus. The results of this research will result in evidence based recommendations on whether targeted or universal decolonization of all patients undergoing Mohs surgery should be adopted. Implementation of this evidence–based topical prophylactic intervention limits the use of oral antibiotics to those with clinically suspected and microbiologically proven SSI. No routine or prophylactic oral antibiotics need to be administered. The intervention is cost effective and fulfils the imperative for responsible antimicrobial stewardship. It prevents the over-use of antibiotics and decreases the potential for ever-increasing bacterial resistance to systemic antibiotics thereby preserving these valuable drugs for the use of future generations.

Figure 1

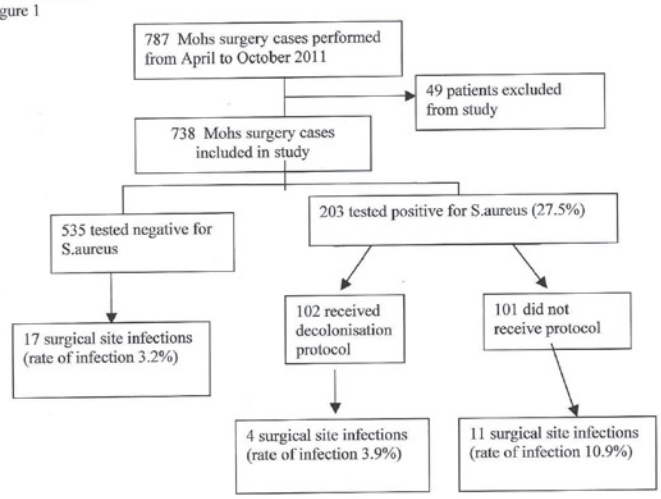
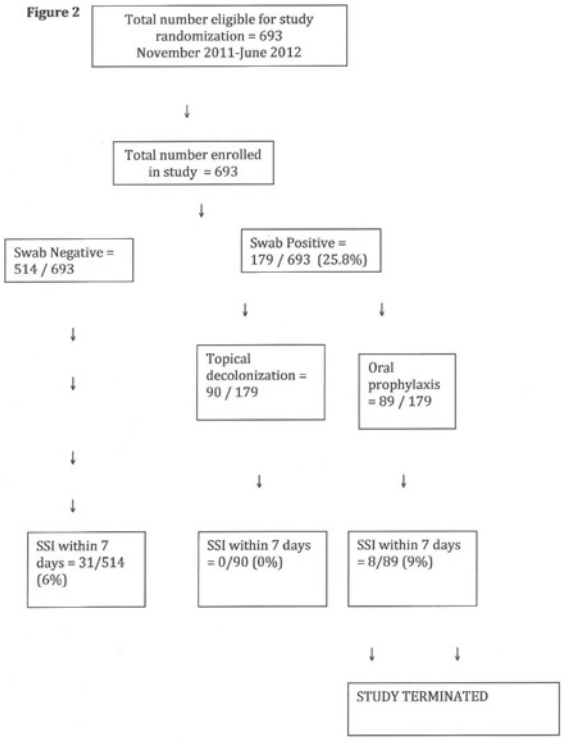


Figure 2



2:22 – 2:29 PM

PRESENTER: Satori Iwamoto, MD, PhD

TITLE: Matrilin-2 Antibody Stains the Stroma Surrounding Basal Cell Carcinomas: Application to Mohs Surgery

AUTHORS: Satori Iwamoto, MD, PhD[1,2]; Zhengke Want, PhD[1]; Fang Xiong, BA[1]; Catherine Breen, MD[1]

INSTITUTIONS: 1. Roger Williams Medical Center, Providence, RI, United States 2. Boston University School of Medicine, Boston, MA, United States

PURPOSE: The tumor microenvironment, including the surrounding stroma, has been increasingly implicated in tumor growth, invasion, and metastasis. Matrilin-2 is an extracellular matrix protein known to inhibit keratinocyte migration and is weakly present in normal skin. We had two objectives. First, we tested the hypothesis that matrilin-2 could play a role in inhibiting tumor invasion by altering the tumor microenvironment. We therefore investigated the expression of matrilin-2 in the stroma surrounding basal cell carcinomas. Second, we wanted to determine whether matrilin-2 would be a useful stain for BCC to be used during Mohs surgery to distinguish malignant from benign structures.

SUMMARY: In all cases of basal cell carcinoma, the stroma surrounding the tumor (including peritumoral fibroblasts and peritumoral extracellular matrix) expressed dramatically high levels of matrilin-2. In contrast, the stroma surrounding adnexal structures showed little or no matrilin-2 labeling. We did not find upregulation of matrilin-2 in the peritumoral stroma of squamous cell carcinomas or of melanomas. Matrilin-4 exhibited the same labeling pattern as matrilin-2, but the intensity of expression was lower. Western blots comparing matrilin-2 protein expression around basal cell carcinomas and around tumor-free tissue confirmed higher levels of matrilin-2 in the tissues associated with basal cell carcinomas. In order to take advantage of matrilin-2's unique pattern of staining the stroma around tumor, we performed double labeling studies with two markers: a keratin marker for the tumor cells and matrilin-2 for the area around the tumor. This created a unique two color pattern that thus far appears specific for identifying BCCs and distinguishing it from any benign structure in Mohs slides.

DESIGN: Tissues of basal cell carcinomas from fourteen patients were immunolabeled with matrilin-2 and matrilin-4 antibody. Keratin markers, including basal cell carcinomas, were used as established markers for immunolabeling basal cell carcinomas. Furthermore, specimens of squamous cell carcinomas and melanomas were also immunolabeled with matrilin-2 to show the contrasting pattern of immunolabeling.

CONCLUSION: Basal cell carcinoma is strongly stroma-dependent; that is, the stroma can influence tumor growth and invasion. Our results show a dramatic increase of matrilin-2 in the stroma surrounding all basal cell carcinomas. Such a stromal response is absent in the more invasive tumors including squamous cell carcinomas and melanomas. We have two conclusions. First, because matrilin-2 is known to inhibit epidermal migration, our findings may explain the relative lower invasiveness of basal cell carcinomas compared to squamous cell carcinomas and melanomas. We are currently testing our hypothesis by performing in vitro invasion assays. Second, and more importantly for Mohs surgery, our results indicate that matrilin-2 is an excellent, and unique, immunostain for BCC during Mohs surgery. Unlike other immunostains for BCC, matrilin-2 exhibits a unique pattern: it stains the stroma around all basal cell carcinomas and not around benign structures.

2:29 – 2:36 PM

PRESENTER: Daniel Winchester, MD

TITLE: Primary Leiomyosarcoma of the Skin: Clinical, Prognostic, and Treatment Factors that Influence Outcomes

AUTHORS: Daniel Winchester, MD[1]; Randall K. Roenigk, MD[1]; Thomas L. Hocker, MD[1]; Christian L. Baum, MD[1]; Clark C. Otley, MD[1]; Phillip C. Hochwalt, MD[1]; Jerry D. Brewer, MD[1]; Christopher J. Arpey, MD[1]

INSTITUTION: 1. Mayo Clinic, Rochester, MN, United States

PURPOSE: We report clinical, prognostic, and treatment factors for cutaneous leiomyosarcoma that both support previous studies and provide new information.

SUMMARY: For all tumors, overall 5-year mortality was 39% (95% CI 21-53%) and 5-year disease-specific mortality was 21% (95% CI 6-32%). Tumor size correlated with a higher rate of metastases ($p<0.02$) and disease-specific mortality ($p<0.03$). Subcutaneous tumors had higher rates of metastasis ($p<0.002$) and disease-specific mortality ($p<0.001$) although 5/48 cases of dermal leiomyosarcoma metastasized. For all tumors, the mean time to recurrence was 5.6 years (SD=7.4) and the mean time to metastasis was 5.8 years (SD=7.8). The most common anatomic site for primary leiomyosarcoma was the extremities followed by the trunk. Males outnumbered females 3:1 in the dermal leiomyosarcoma classification; however, in subcutaneous tumors males and females were represented equally. The mean age for development of dermal tumors was 54.8 years and for subcutaneous tumors was 59.7 years (Figure 1). With similar mean tumor size and tumor depth, rates of recurrence and metastasis were significantly lower when treated by wide local excision with at least 1 cm margins compared to excision with narrow margins although there was no significant difference in disease-specific mortality. 14 cases treated by Mohs micrographic surgery with a mean follow-up of 5.6 years showed no recurrences, metastases, or disease-specific deaths (Figure 2). These cases had similar mean tumor size and depth as the narrow excision and wide local excision groups. Twenty one cases of metastases from primary leiomyosarcoma of the skin were evaluated. The most common sites of metastasis were other sites on the skin (76%) followed by the lungs (43%) and the small bowel/liver (29%). 57% of cases of metastases resulted in tumors in the scalp and 78% of these patients expired from leiomyosarcoma within 2 years (Figure 3).

DESIGN: We performed a retrospective study of 71 patients evaluated from January 1, 1965, to September 1, 2013, who

had a histologic diagnosis of cutaneous leiomyosarcoma. Using Kaplan-Meier statistical analysis, we compared clinical characteristics and treatment modalities with outcomes of recurrence, metastasis, and disease-specific mortality. We also evaluated clinical characteristics of 21 cases that metastasized.

CONCLUSION: Leiomyosarcoma of the skin is a rare tumor often not biopsied until it grows rapidly, becomes painful, and/or ulcerates. Delayed diagnosis and inadequate treatment can lead to poor outcomes such as recurrence, metastasis, or death. Our results on worse outcomes with larger tumors and subcutaneous tumors support previous studies. We provide new information on improved outcomes with wide local excision with 1 cm margins or Mohs micrographic surgery. Literature has shown that primary dermal leiomyosarcoma frequently metastasizes to the lungs and liver leading to a poor prognosis; however, we now report skin metastases being the most common organ site that similarly appears to be associated with a poor prognosis.

Figure 1.

Patient and primary tumor characteristics at time of diagnosis

	Dermal (N=48)	Subcutaneous (N=23)	
Age (yrs)	54.8	59.7	
Gender (M:F)	3:1	1:1	
Tumor size (cm)	1.5	3.9	p=0.003
	No (%)	No (%)	
Location			
Head/Neck	11 (23)	4 (18)	
Face	4	1	
Scalp	6	1	
Neck	1	2	
Trunk	12 (25)	7 (30)	
Chest/abdomen	5	1	
Back	5	3	
Buttock	1	2	
Groin	1	1	
Extremity	25 (52)	14 (52)	
Proximal Arm	9	2	
Distal Arm	4	2	
Proximal Leg	8	8	
Distal Leg	4	2	
Recurrence at 5 yrs	18%	28%	p=0.167
Metastasis at 5 yrs	12%	51%	p=0.001
Disease-specific mortality	6%	40%	p=0.002

Figure 2.

Treatment of LMS

Treatment	Recurrence	Metastasis	Disease-specific mortality
Excision	68%	67%	38%
WLE	9%	10%	10%
WLE + radiation	10%	31%	26%
MMS	0%	0%	0%
	P < 0.001	P = 0.002	P = 0.210

Figure 3.

Metastases from primary superficial leiomyosarcoma

	Dermal	Subcutaneous
Number of cases	5	16
Location of 1° tumor		
Scalp	3	2
Face/Neck	0	2
Trunk	0	5
Extremities	2	7
# of metastatic tumors	9	48
Location of metastasis		
Skin		
Scalp	7	16
Face neck	0	6
Trunk	0	5
Extremities	1	4
Lungs	1	9
Bowel	0	3
Liver	0	4
Brain	0	1

2:36 – 2:43 PM

PRESENTER: Tracie Chong, MD

TITLE: Mohs Appropriate Use Criteria: Retrospectively Applied to NMSCs at a Single Academic Center

AUTHORS: Glen M. Bowen, MD[1]; Keith L. Duffy, MD[1]; Bradley K. Summers, MD[1]; Tracie Chong, MD[1]; Payam Tristani-Firouzi, MD[1]; Michael L. Hadley, MD[1]

INSTITUTION: 1. University of Utah, Salt Lake City, UT, United States

PURPOSE: In September 2012, appropriate use criteria (AUC) for Mohs micrographic surgery (MMS) were released by a collaboration of dermatology organizations including the American College of Mohs Surgery. Our group sought to determine adherence to the Mohs AUC at our academic institution.

SUMMARY: We performed a retrospective chart review of all non-melanoma skin cancers [NMSC defined as all basal cell (BCC) and squamous cell carcinomas (SCC); rarer subtypes were excluded] treated within the university's Department of Dermatology from January thru March of 2012. We applied the Mohs AUC to analyze these cases. The treating staff included 29 full-time academic dermatologists (5 of which are ACMS fellowship trained Mohs surgeons), 4 physician assistants, and 9 dermatology residents. In total, we identified 727 patients and 1038 cases of NMSC. We identified 557 (53.7%) BCC and 469 (45.2%) SCC. These were distributed as follows: 627 (60.4%) of NMSC were located on the head/neck and 410 (39.5%) on the trunk and extremities. In the BCC group, subtypes included 136 (24.4%) superficial, 75 (13.5%) nodular, 191 (34.3%) micronodular, and 155 (27.8%) infiltrative. In the SCC group, there were 255 (54.4%) in-situ/Bowen's, 59 (12.6%) superficially invasive, 58 (12.4%) invasive, 24 (5.1%) keratoacanthoma, and 61 (13.0%) unspecified. Out of 1038 NMSC, 342 (32.9%) were treated with MMS; of this subset 247 (72.2%) were BCC and 89 (26.0%) SCC. In the MMS group we treated 178 NMSC (52.0% of MMS cases, 137 BCC, 38 SCC) in the H region, 121 NMSC (35.4% of MMS cases, 78 BCC, 40 SCC) in the M region, 43 NMSC (12.6% of MMS cases, 32 BCC, 11 SCC) in the L region. Overall, in all cases of NMSC treated with MMS, there were

326 cases (95.3%) deemed appropriate, 4 (1.2%) uncertain, and 6 (1.8%) inappropriate per AUC. The inappropriate cases were located in the L region, consisting of 4 superficial BCC, one actinic keratosis with focal SCC in-situ, and one primary non-aggressive SCC. Also examined were 620 cases not treated with MMS (e.g. excision, electrodessication and curettage, topical therapy, etc…). Mohs AUC criteria were applied to this group and 58.6% of BCC (n= 156) treated with another modality would have met AUC for MMS and 61.9% of SCC (n=219) treated with another modality would have met AUC for MMS. In a three month review of all NMSC cases at our academic center, 1.8% (6/342) were deemed to be inappropriately treated with MMS. Conversely, 60.5% of NMSC treated with another modality would have met criteria for MMS.

CONCLUSION: At our institution, there are a low percentage of cases performed that is inappropriate for MMS by AUC. Our data shows that within our academic center there is potential underutilization of MMS given the current consensus AUC.

Figure 1. Non-melanoma skin cancer treated with Mohs (n=342)

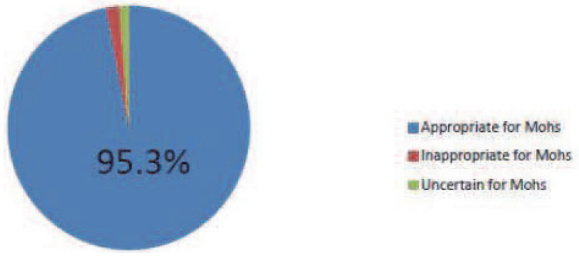
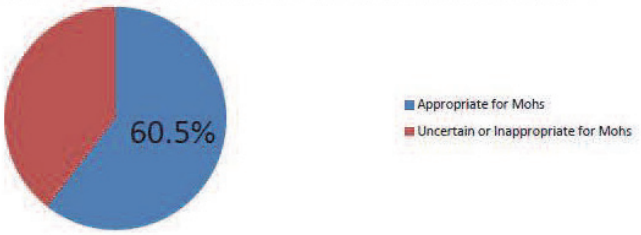


Figure 2. Non-melanoma skin cancer not treated with Mohs (n=620)



2:43 – 2:50 PM

PRESENTER: Thuzar M. Shin, MD, PhD

TITLE: **Predicting Subclinical Spread of Melanoma In-situ Treated with Mohs Micrographic Surgery**

AUTHORS: Thuzar M. Shin, MD, PhD[1]; Joseph F. Sobanko, MD[1]; Jeremy Etzkorn, MD[1]; Christopher J. Miller, MD[1]

INSTITUTION: 1. University of Pennsylvania, Philadelphia, PA, United States

PURPOSE: Conventional excision for melanoma in situ (MIS) with subclinical spread may leave residual disease, increase rates of local recurrence, and require additional surgery. Mohs micrographic surgery (MMS) allows real time detection and excision of subclinical microscopic spread, decreasing the rates of local recurrence and additional surgical procedures. Current appropriate use criteria for MMS for MIS are based on consensus guidelines. Rigorous study of clinical and pathologic factors could help predict which MIS are more likely to have subclinical spread and determine more specific indications for MMS. The purpose of this study is to create a prediction model for subclinical spread of MIS by examining the association of numerous clinical and pathologic factors with the requirement for more than one stage for microscopic clearance by MMS.

SUMMARY: A total of 679 cases of MIS were identified. 462 tumors (68%) cleared after one stage of MMS, while 217 (32%) required more than one stage. More than one stage of MMS was statistically significantly more likely for MIS with the following characteristics: increased patient age (age ≥60 [n=475] vs. age < 60 [n=205] [p = 0.025]); recurrent status (recurrent [n=83] vs. primary [n=596]) [p < 0.0001]; preoperative size (≥ 1 cm [n=469] vs. < 1 cm [n=210]) [p = 0.0042]; and anatomic location on the head and neck (head/neck [n=542] vs. all other locations [n=137]) [p = 0.0009]. Clearance rates in more specific anatomic locations were evaluated. Among regions on the trunk/extremities, the lowest clearance rates were on the extensor forearm (50%, n=8) and infraclavicular chest (57.1%, n=7). On the hands and feet (n=37), the lowest clearance rates were on the plantar foot (42.9%, n=7) and nail unit (69.2%, n=13). On the head and neck (n=542), subunits with the lowest clearance rates after one stage included the eyelid (36.4%, n=33), nose (55.6%, n=90), forehead/brow (60%, n=55), scalp/mastoid (64.4%, n=45), and ear (68.5%, n=48). The requirement for more than one stage of MMS was not more likely based on gender and immunusuppression.

DESIGN: Retrospective analysis of a prospectively entered cohort of patients undergoing MMS with MART-1 staining for MIS at an academic medical center from March 2006 through September 2013.

CONCLUSION: Our results suggest that potential risk factors for subclinical spread of MIS include age >60, recurrent status, preoperative size >1 cm, and anatomic location on the head and neck. Statistical analysis of additional factors (e.g., specific anatomic subunits, histologic subtypes of MIS) is being completed. These data can help devise a prediction model for subclinical spread of MIS and could be useful to develop evidence-based appropriate use criteria for MMS.

2:50 – 2:57 PM

PRESENTER: Thomas J. Knackstedt, MD

TITLE: **Shared Medical Appointments for the Preoperative Mohs Surgery Consultation: A Win-Win Proposal**

AUTHORS: Thomas J. Knackstedt, MD[1]; Faramarz H. Samie, MD, PhD[1]

INSTITUTION: 1. Dartmouth Hitchcock Medical Center, Department of Dermatology, Lebanon, NH, United States

PURPOSE: Mohs micrographic surgery is often used to treat nonmelanoma skin cancers. In a 2007 survey, 67% of the American College of Mohs Surgery members reported performing preoperative consultations prior to the day

of surgery. Shared medical appointments (SMA) are becoming increasingly popular for chronic medical and elective surgical conditions. SMAs are ideal for Mohs surgery because all patients receive similar information about skin cancer pathophysiology, prevention, treatment and subsequent reconstructive options. We sought to implement an SMA for the preoperative visit of Mohs surgery. With an increased emphasis on patient centered outcomes such as satisfaction, the acceptance of SMAs is important.

SUMMARY: 91 patients, average age 71 (32-94, SD 12.3) were seen in 12 SMAs between July 30th and November 1st 2013. SMAs averaged 7 to 8 patients per session. Sessions were attended by 49 (54%) men and 42 (46%) women with 98 skin cancers; specifically 71 (72.45%) BCC, 21 (24.49%) SCC or SCC IS, and 3 (3.06%) low risk adnexal tumors. 61 (67%) patients completed and returned the post-visit survey. The survey revealed that most patients (88.52%) found the SMA to be useful, felt prepared for the upcoming procedure (95.10%) and even preferred the SMA over a conventional visit (70.49%); opting to repeat this model in the future (81.97%). 56 (91.8%) respondents strongly agreed or agreed that they had adequate time with the provider, received thorough care (88.52%), were informed about their diagnosis (85.25%) and treatment options (86.89%) and were ultimately involved in decision making (75.41%). Patients felt comfortable (37.70%) or very comfortable (47.54%) in the SMA setting.

DESIGN: The preoperative consultation visit for Mohs surgery was designed as an SMA which consisted of group education followed by individual physical examination and physician assessment. SMA visits were only offered to patients with a biopsy proven diagnosis of SCC or BCC. All patients had the option of a conventional medical appointment. Rare and highly aggressive cutaneous neoplasms continued to be managed in a one-on-one setting. Outcome measures were obtained via a 13 question patient satisfaction survey given to all patients attending SMA visits and returned by mail. Five questions were in a yes/no format, seven on a 5-point Likert scale, and one for any comments.

CONCLUSION: Our data show that patient satisfaction for SMAs can be high, likely equal to individual appointments. SMAs have added benefits including the exchange of information and coping strategies among patients. Patients can still be seen in a private exam room for individualized care as needed. Likewise, physicians benefit from easy implementation, increased productivity, shorter appointment waitlists, and a better educated patient population.

2:57 – 3:04 PM

PRESENTER: Erica H. Lee, MD

TITLE: Hearing the Patient's Voice: Quality of Life Outcomes in Dermatologic Surgery

AUTHORS: Erica H. Lee, MD[1]; Ann Klassen, DPhil[2]; Jessica Lawson, MSc[3]; Amie Scott, BA[4]; Kishwer S. Nehal, MD[1]; Stefan Cano, PhD[5]; Andrea Pusic, MD, MHS[6]

INSTITUTIONS: 1. Memorial Sloan Kettering Cancer Center, Dermatology, New York, NY, United States 2. McMaster University, Hamilton, ON, Canada 3. Yeshiva University, New York, NY, United States 4. Memorial Sloan Kettering Skin Cancer Center, New York, NY, United States 5. Peninsula College of Medicine & Dentistry, Plymouth, United Kingdom 6. Memorial Sloan Kettering Skin Cancer Center, Plastic Surgery, New York, NY, United States

PURPOSE: Health-related quality of life (HRQOL) is a multidimensional concept, which in the skin cancer population includes scarring and disfigurement, anxiety and fears of future skin cancers. HRQOL is increasingly being recognized as an integral component of dermatologic surgery outcomes and best measured by patient-reported outcome (PRO) instruments. Although there are PRO instruments in dermatology, their use are limited in the skin cancer population due to contextual and methodological shortcomings suggesting a more comprehensive instrument is needed. When developing a PRO instrument, qualitative research provides the foundation for the item generation phase by identifying important concerns from the patient's perspective. A qualitative study was performed to identify important health, aesthetic and procedure-related concerns of the facial skin cancer patient population.

SUMMARY: Patients who undergo surgical management for skin cancer described important concerns in the following five main areas: psychological health (e.g. fear of new cancers, recurrence), social health (e.g. impact on leisure activities and social interaction), appearance-related concerns (e.g. facial scars), adverse effects (e.g. short term pain, swelling and long term effects) and process of care (e.g. satisfaction with surgeon). These five themes form the basis of a new conceptual framework of quality of life issues in patients undergoing facial surgery for skin cancer.

DESIGN: Approval was obtained from the Institutional Review Board. We conducted 15 in-depth qualitative interviews by experienced qualitative researchers (10 non-melanoma and 5 early stage melanoma). Interviews were semi-structured, audio-taped, transcribed verbatim and coded using a line-by-line approach with NVivo10 software. Data collection and analysis took place concurrently to develop conceptual categories using the constant comparison method. The categories were grouped to identify key themes.

CONCLUSION: Patient concerns following a skin cancer diagnosis and surgical treatment have repercussions in multiple spheres of a patient's life beyond the impact of a facial scar. The identified themes form a framework that will guide further measurement of HRQOL and the development of a new PRO instrument. Although the instrument is in development, clinicians providing skin cancer care should be cognizant of such patient concerns. Furthermore, a better understanding of the pre-, peri- and post-procedure periods may provide opportunities for quality improvement, guide clinical management decisions and contribute to greater post-procedure satisfaction. As health care moves towards

a patient-centered approach with an emphasis on evidence-based, cost-effective care, accurately measuring the impact of the surgical treatments we offer our patients will be critical.

3:04 – 3:11 PM

PRESENTER: Susan D. Mathias, MPH

TITLE: The aBCCdex: a Patient-Reported Outcome (PRO) Questionnaire for Patients with Advanced Basal Cell Carcinoma or Basal Cell Carcinoma Nevus Syndrome

AUTHORS: Susan D. Mathias, MPH[1]; Mary-Margaret Chren, MD[2]; Ross Crosby, PhD[3]; Hilary H. Colwell, MPH[1]; Yeun Mi Yim, MPH[4]; Carolina Reyes, PhD[4]; Diana Chen, MD[4]; Scott W. Fosko, MD[5]

INSTITUTIONS: 1. Health Outcomes Solutions, Winter Park, FL, United States 2. University of California, San Francisco, CA, United States 3. Neuropsychiatric Research Institute, Fargo, ND, United States 4. Genentech, Inc., South San Francisco, CA, United States 5. Saint Louis University, St. Louis, MO, United States

PURPOSE: Basal cell carcinoma (BCC) is the most common cancer with ~2.8 million annual cases diagnosed in the US. BCC patients may develop locally advanced disease or metastatic BCC, together defined as aBCC. Basal cell carcinoma nevus syndrome (BCCNS), a rare genetic condition, increases the risk of developing BCCs. Little is known about the health-related quality of life (HRQoL) and disease burden of patients with aBCC and BCCNS. Based on patient and clinician interviews, 2 new PRO questionnaires were recently developed. This study evaluated the scale structure and measurement properties of these new questionnaires.

SUMMARY: 66 aBCC (60 locally advanced, 6 metastatic; mean age, 65.4 years; 26% female) and 63 BCCNS (45.1 years; 51% female) subjects were enrolled. EFA resulted in 5 scales (Figure 1): worry about future lesions (5 items), mental health (6 items), social/relationships (5 items), lesion symptoms (3 items), and life impact (7 items). EFA identified several BCCNS-specific items to omit. Remaining items were relevant for patients with either aBCC or BCCNS and therefore allowed the development of a single questionnaire (aBCCdex). Cronbach a coefficients (internal consistency reliability) exceeded 0.86 (≥0.70 acceptable) for all 5 scales; intraclass correlations (test-retest reliability) ranged from 0.64-0.90 (≥0.70 acceptable). Scale scores correlated significantly and strongly with several collateral measures (construct validity). For known-groups validity, more impaired/severe patients (by Skindex-16 or PDSI) showed significantly more impaired aBCCdex scores (Figure 2). Using PGIC categorizations, responsiveness was demonstrated by improvement in aBCCdex scale scores (for those rating themselves as improved) or deterioration (for those rating themselves as worse) during the 3 months.

DESIGN: aBCC and BCCNS patients were recruited by the BCCNS Life Support Network and 10 clinical sites in the US. At baseline and month 3, patients completed the new questionnaires as well as the Skindex-16, SF-12, Work Productivity and Activity Impairment Questionnaire, the Patient Disease Severity Item (PDSI; baseline only), and the Patient Global Impression of Change (PGIC; month 3 only). A subset of patients completed questionnaires at day 10 for test-retest reliability. Participating dermatologists (including 4 Mohs surgeons) and oncologists completed a brief clinical form. Internal consistency reliability, test-retest reliability, construct validity, known-groups validity, and responsiveness were assessed. Exploratory Factor Analysis (EFA) identified the number of scales. Data were analyzed by disease group (aBCC, BCCNS) and overall (combined sample).

CONCLUSION: Patients with aBCC and BCCNS are significantly impacted across many areas. The aBCCdex is the first PRO questionnaire developed for aBCC and BCCNS patients. It has been found to be reliable, valid, and responsive. Intended for use in clinical practice or research, the aBCCdex provides a comprehensive assessment of HRQoL and associated changes over time.

Figure 1.

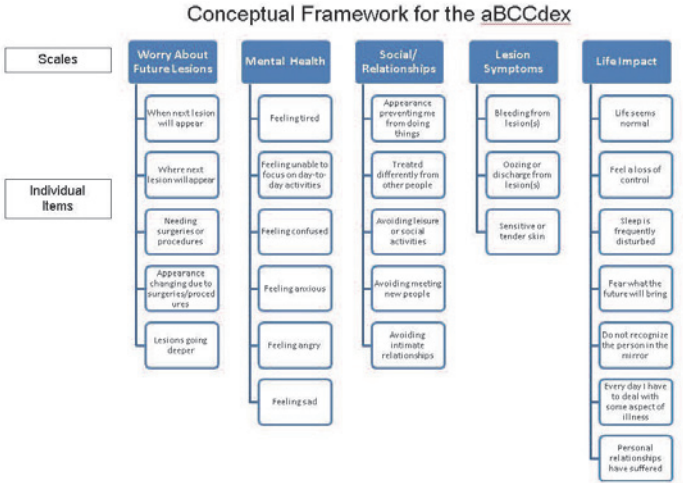
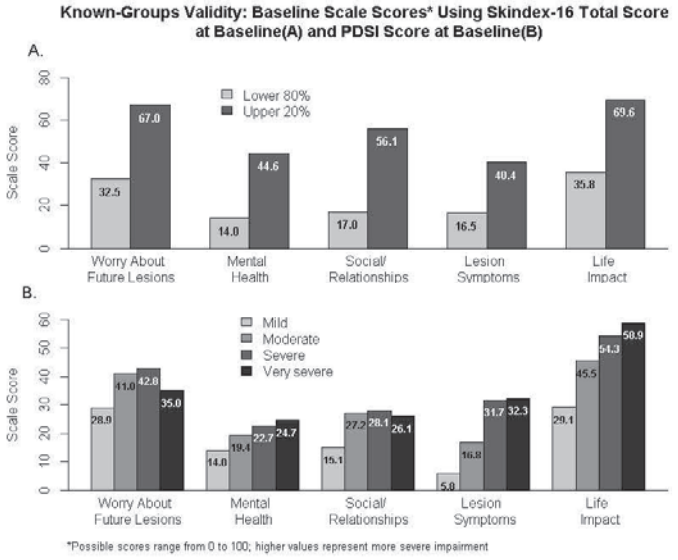


Figure 2.



3:30 – 3:36 PM

PRESENTER: Timothy W. Chang, MD

TITLE: Complications with New Oral Anticoagulants Dabigatran and Rivaroxaban in Cutaneous Surgery

AUTHORS: Timothy W. Chang, MD[1]; Christopher J. Arpey, MD[1]; Christian L. Baum, MD[1]; Jerry D. Brewer, MD[1]; Randall K. Roenigk, MD[1]; Thomas L. Hocker, MD[1]; Phillip C. Hochwalt, MD[1]; Clark C. Otley, MD[1]

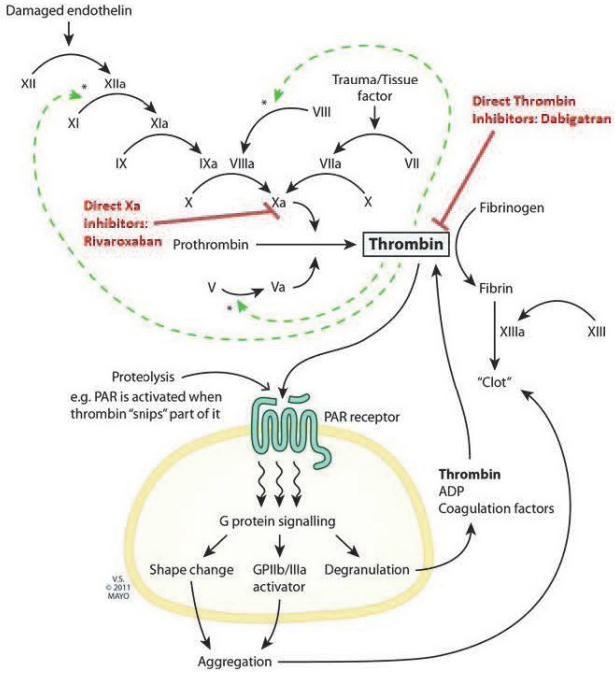
INSTITUTION: 1. Mayo Clinic, Rochester, MN, United States

PURPOSE: Dabigatran and rivaroxaban are new orally administered anticoagulants that have been approved by the Food and Drug Administration in 2010 and 2011, respectively. Dabigatran, an oral direct thrombin inhibitor, and rivaroxaban, an oral factor Xa inhibitor, are approved for the treatment of atrial fibrillation and stroke prophylaxis. Initial studies of non-operative bleeding risks suggest that dabigatran is not associated with a greater overall rate of hemorrhage than other anticoagulants. While dabigatran and rivaroxaban are becoming more attractive alternatives to other anticoagulants due to simple once or twice daily oral dosing and little to no laboratory monitoring, neither have specific antidotes for reversal. To our knowledge, there is no published data on the use of dabigatran or rivaroxaban in patients undergoing cutaneous surgery. Patient safety during cutaneous surgery is of the utmost importance. With the advent of these new blood-thinning medications, optimal perioperative management of patients taking dabigatran or rivaroxaban is unclear. Here we report the first study of perioperative complications associated with patients taking dabigatran or rivaroxaban during cutaneous surgery.

SUMMARY: 27 patients taking dabigatran underwent 41 cutaneous surgeries. Mild bleeding complications occurred in 1 of 27 patients (41 surgical sites). There were no severe complications observed. The case involved a 73 year old male taking dabigatran 150mg twice a day for atrial fibrillation/stroke prophylaxis who underwent Mohs micrographic surgery for a nodular basal cell carcinoma on the right cheek. The lesion was cleared in two stages and repaired with an intermediate layered closure. For two days after surgery, intermittent bleeding from the wound was not alleviated with pressure. Hemostasis was achieved with a pressure dressing placed in clinic that was maintained for three days and then changed daily. There were no further complications. Four patients on rivaroxaban underwent five cutaneous surgeries. No associated bleeding complications were observed.

DESIGN: This study was approved by the Mayo Clinic IRB. The Mayo Clinic diagnostic index and medication database was queried to identify all patients who underwent Mohs micrographic surgery or basic excision at Mayo Cllinic Dermatologic Surgery while taking dabigatran or rivaroxaban between 2010 and 2013. Retrospective analysis was performed to identify related bleeding complications in the perioperative period. Case controls were planned but not used due to the low rate of complications.

CONCLUSION: In this cohort of patients, none experienced severe or life-threatening hemorrhagic complications from cutaneous surgery while taking dabigatran or rivaroxaban. Given the potential for severe thrombotic complications associated with discontinuation of these anticoagulants and the apparent low risks of continuing these medications, a strategy of continuation of these medically necessary anticoagulants during cutaneous surgery is most reasonable.



3:36 – 3:42 PM

PRESENTER: H. William Higgins, II, MD, MBE

TITLE: Recurrent Tumors Treated with MMS: How do they differ from Primary Tumors?

AUTHORS: H. William Higgins, II, MD, MBE[1]; Kachiu C. Lee, MD, MPH[1]; Antonio Cruz, MD[1]; Raymond G. Dufresne, Jr., MD[1]

INSTITUTION: 1. Brown University, Department of Dermatology, Providence, RI, United States

PURPOSE: Recurrent non-melanoma skin cancers (NMSC) fulfill appropriate use criteria for Mohs micrographic surgery (MMS), and are frequently treated with this modality. We compared a cohort of recurrent and primary tumors to assess patient and tumor characteristics of recurrent tumors.

SUMMARY: Data on 10,948 tumors was collected, of which 1397 (11%) were referred for MMS due to recurrence after prior treatment. There was no difference in the proportion of men vs. women presenting with primary or recurrent tumors (Table 1). Patients with recurrent tumors

were significantly older than the cohort presenting with primary tumors (p<.01, Table 1). Among recurrent tumors, both men and women presented at similar ages. When evaluating location, there were significantly more recurrent tumors on the scalp (10% of all recurrent tumors were on the scalp, 6% of all primary tumors were on the scalp, p=.02), upper extremities not including the hands (7% recurrent, 2% primary, p<.01), and trunk (8% recurrent, 3% primary, p<.01). There were more primary tumors on the nose (17% recurrent, 23% primary, p=.03). Recurrent tumors were associated with larger initial presenting area (p<.01), more layers (p<.01), and larger final defect size (p<.01, Table 2). After controlling for confounding variables, recurrent tumors required significantly more layers (p<.01) for tumor clearance and were associated with larger final areas (p<.01). There were no differences in repair types (secondary intention, primary closure, grafts, plastic surgery referral) between the recurrent and primary tumors.

DESIGN: A retrospective chart review was performed at an academic Mohs surgery center based in the Northeast to evaluate all patients treated with MMS over a 7-year period (2005-2011). This center serves as the major tertiary referral center for the entire state. Data on patient demographic factors and tumor characteristics were collected. Analysis was performed using χ2, t-tests, and univariate and multivariate regressions.

CONCLUSION: In this study, tumors recurrent after prior treatment presented in older individuals, and were more common on the scalp, trunk, and upper extremities. The trunk and upper extremities represent areas that may not initially fit the Mohs appropriate use criteria. Any high-risk tumors on these areas should be considered for MMS. In addition, this study also found that tumors recurrent after prior treatment that were subsequently treated with MMS required significantly more layers for clearance and a larger final defect size, even after controlling for layers. Limitations to this study included lack of data on previous treatment modality. Data was only collected from a single institution.

Table 1: Demographics of patients with primary vs. recurrent tumors treated from 2005-2011 at a university-based practice.

	All	Men	Women
Number of primary tumors	10,948	6911, 63%	4037, 37%
Number of recurrent tumors	1397	930, 69%	465, 33%
Primary Tumors (age)	70.7±12.1	71.4±12.6	69.6±14
Recurrent Tumors (age)	73.8±13.2	73.9±11.9	73.6±13.1
p-value (age comparison)	<.01	<.01	<.01

Table 2: Characteristics of recurrent and primary tumors treated from 2005-2011 at a university-based practice.

	Initial mean area (95% confidence interval)	Layers (95% confidence interval)	Final mean area (95% confidence interval)
Primary tumors, all	1.07 (1.02-1.12)	1.55 (1.54-1.57)	3.4 (3.31-3.49)
Men	1.16 (1.09-1.23)	1.54 (1.53-1.56)	3.65 (3.5-3.8)
Women	0.92 (0.85-0.98)	1.57 (1.55-1.60)	2.96 (2.84-3.1)
Recurrent tumors, all	2.08 (1.89-2.26)	1.77 (1.72-1.82)	6.9 (6.4-7.4)
Men	2.28 (2.03-2.53)	1.75 (1.68-1.81)	7.65 (6.99-8.31)
Women	1.65 (1.40-1.90)	1.82 (1.73-1.91)	5.51 (4.86-6.17)

3:42 – 3:48 PM

PRESENTER: Anne R. Zhuang, MD

TITLE: A Single Center Series Characterizing the Subclinical Aggressiveness of Non-melanoma Skin Cancers in HIV/AIDS Patients Treated with Mohs Micrographic Surgery

AUTHORS: Anne R. Zhuang, MD[1]; Soohyun Kim, BS[2]; Arisa Ortiz, MD[1]; S. Brian Jiang, MD[1]

INSTITUTIONS: 1. University of California San Diego, Department of Dermatology, San Diego, CA, United States 2. University of California San Diego Medical School, San Diego, CA, United States

PURPOSE: The relationship between immunosuppression in HIV/AIDS and the development of non-melanoma skin cancers (NMSCs) has previously been described in the literature. However, only a few studies have focused on characterizing these NMSCs since antiretrovirals (ARVs) have become the standard of care. The purpose of this study was to investigate the impact of HIV/AIDS immunosuppression in the ARV era on the aggressive subclinical extension (ASE) of NMSCs treated with Mohs micrographic surgery (MMS).

SUMMARY: A total of eighty-four patients and two hundred NMSCs were included in the study, with forty-four lesions satisfying the ASE criteria. All but three patients were on antiretrovirals at the time of their MMS or at sometime in their past. The study population was predominantly male (97.4%), and 71.5% of the NMSCs presented between the ages of forty and sixty. Of the major subtypes of NMSC, basal cell carcinomas (BCCs) comprised a slight majority over squamous cell carcinomas (SCCs) and SCC in situ (58.5% versus 41.5%). "Nodular" and "multicentric" or "superficial" were the two most common subtypes of BCC in both the ASE and non-ASE subgroups. Of the BCCs treated in our study population, only the metatypical subtype was more likely to satisfy ASE criteria, with an odds ratio (OR) of 1.79. SCCIS tumors were also more likely to demonstrate ASE (OR 2.70); however, SCCs were found to have the opposite behavior (OR 0.247). The most common locations of tumors with ASE were on the trunk (22.7%) followed by the arm (18.2%), while tumors without ASE were more likely to be on the arm (13.5%) and lower extremity (11.5%). There was no statistically significant difference in the average CD4 T-cell count between the ASE and non-ASE populations.

DESIGN: A retrospective review of clinical records from our institution was performed and included all patients

with a diagnosis of HIV/AIDS who had NMSCs treated by MMS from 2007-2011. Patient demographics and tumor characteristics were noted. ASE was defined as those tumors that required at least three MMS stages and had a final surgical margin of at least one centimeter.

CONCLUSION: Consistent with prior studies, BCCs comprise the majority of NMSCs in the HIV/AIDS population, and the most common subtypes of BCC do not demonstrate aggressive subclinical extension. In contrast, SCCIS tumors are more subclinically aggressive in HIV/AIDS patients compared to their invasive counterparts. Interestingly, the degree of HIV/AIDS immunosuppression, as evidenced through total CD4 T-cell counts, did not appear to have any significant impact on the ASE of NMSCs. Understanding the subclinical behavior of NMSCs in HIV/AIDS patients imparts information that can help guide the preoperative treatment plan and potentially result in better outcomes.

3:48 – 3:54 PM

PRESENTER: Melissa Nantel-Battista, MD, FRCPC

TITLE: Skin Cancer Screening after Solid Organ Transplantation: Survey of Current Practices in Canada

AUTHORS: Eric Coomes, BHSc[1,2]; Kevin Lam, BSc[1,2]; Melissa Nantel-Battista, MD, FRCPC[1,2]; Jessica Kitchen, BSc[1,2]; An-Wen Chan, MD, DPhil, FRCPC[1,2]

INSTITUTIONS: 1. University Toronto, Department of Dermatology, Tornoto, ON, Canada 2. Women's College Hospital, Toronto, ON, Canada

PURPOSE: Non-melanoma skin cancer is the most common post-transplant malignancy, developing in over 50% of transplant recipients. Post-transplant screening guidelines recommend skin examinations at least annually to enable early detection and treatment of skin cancer. Previous surveys reveal suboptimal levels of screening. We aimed to determine current attitudes, practices, and barriers to skin cancer screening and education after solid organ transplantation in Canada.

SUMMARY: The response rate was 48% (230/479); we excluded 20 responders who did not provide any post-transplant care, and 26 pediatric caregivers. Responder characteristics are outlined in Table 1. Transplant personnel viewed skin cancer screening as very important, with a median rating of 10 [interquartile range 8-10] on a scale of 1-10. However, only 57% of respondents ensured at least annual screening in accordance with established guidelines [Table 2]. Adherence to annual screening was significantly ($p<0.003$) associated with having a screening policy in place (odds ratio 5.6, 95% CI 2.8-11) and having a dermatologist in the same medical center (OR 3.0, 95% CI 1.5-6.0). Post-transplant skin cancer education was similarly considered very important (median 10/10, IQR 9-10). Education frequently included sunscreen use (99%), sun avoidance (92%), and the association between immunosuppression and skin cancer (89%). However, only 78% discussed self-skin examination and 69% discussed all four topics with patients. Overall accessibility to dermatology was rated as moderate (median 7/10, IQR 4-9). However, 35% rated accessibility as less than or equal to 5 out of 10. Centers with an on-site dermatologist had significantly higher accessibility ratings than those without (median 8/10 versus 4.5/10, $p<0.0001$). The primary reported barriers to dermatology access were long wait times (48%), lack of availability of transplant dermatologists (35%), and excessive distance to the nearest dermatologist (26%) [Table 3].

DESIGN: A cross-sectional survey of transplant center personnel in Canada was performed from July to December 2013. Questionnaires were sent to all 479 post-transplant physicians and nurses identified from the Canadian Organ Replacement Registry and transplant center directories. Our primary outcome was the proportion of respondents adhering to annual skin cancer screening and factors associated with adherence. We also ascertained data on clinic characteristics, practices and perceived importance of screening and patient education, and accessibility of dermatologists. We tabulated descriptive statistics and performed multivariable logistic regression to identify factors associated with adherence to annual screening. Analyses were performed using Stata (Version 12).

CONCLUSION: While post-transplant skin cancer screening is perceived to be very important, there is often a failure to adhere to skin cancer screening guidelines. Most transplant center personnel are educating their patients, but effort must be made to cover all relevant domains. Development and implementation of formal screening policies and improved accessibility to dermatologists at transplant centers may improve overall adherence to annual screening.

Table 1: Respondent Characteristics (N=184)

Province		
Alberta	15	8%
British Columbia	25	14%
Manitoba	14	8%
Nova Scotia	7	4%
Ontario	67	36%
Quebec	50	27%
Saskatchewan	6	3%
Role		
Physician	89	48%
Nurse	95	52%
Organ Transplant Recipient		
Kidney	69	38%
Liver	27	15%
Heart	35	19%
Lung	18	10%
Bowel	1	1%
Multiple (kidney + other)	30	16%
Multiple (liver + other)	4	2%
Number of patients		
Median [25%-75%]	250 (130-600)	
1-150	53	29%
151-300	51	28%
301-450	19	10%
451-600	15	8%
>600	46	25%

Table 2: Skin Cancer Screening Practices

Screening Policy (N=180)		
Yes, unwritten policy	76	42%
Yes, written policy	24	13%
Screening Initiation (N=173)		
Pre-Transplant or Within 12 months post-transplant	109	63%
After 12 months post-transplant	5	3%
Not routinely necessary	39	23%
Not sure	20	12%
Screening Frequency (N=171)		
Frequency Interval: at least every 12 months	97	57%
Frequency Interval: greater than 12 months	15	9%
Not routinely necessary	44	26%
Not sure	15	9%
Type of Skin Exam in transplant clinic (N=116)		
Full	40	34%
Limited	76	66%
Person Responsible for Skin Exam (N=180)		
Transplant Physician	99	55%
Transplant Nurse	77	43%
Family Physician	74	41%
Dermatologist	128	71%
Patient	63	35%
Tailor Screening based on risk factors (N=172)		
Yes	107	62%

Table 3: Access to Dermatology

Most accessible dermatologist (N=176)		
In our medical centre	101	57%
In another hospital	19	11%
In the community (private clinic)	51	29%
Access to dermatologist specializing in transplant (N=178)		
Yes (Overall)	105	59%
Yes, in our medical centre	72	40%
Yes, in another hospital	13	7%
Yes, in the community (private clinic)	20	11%
No	63	35%
Barriers to Access (N=176)		
Excessive wait time	84	48%
No specialized transplant dermatologist	61	35%
Excessive distance	46	26%
Difficult to routinely refer	26	15%
Lack of priority	44	25%
No barriers	45	26%

3:54 – 4:00 PM

PRESENTER: Sweta Rai, MBBS, MRCP, MRCP Dermatology

TITLE: **The Electronic Mohs Map; the Future of Mohs Surgery Data Recording?**

AUTHORS: Sweta Rai, MBBS, MRCP, MRCP Dermatology[1]; Phillipa Shephard, BSC[1]; Stephen Keohane, MBBS, FASMS, FRCP[1]

INSTITUTION: 1. Portsmouth Hospitals NHS Trust, St. Mary's Hospital, Hampshire, United Kingdom

PURPOSE: Historically Mohs' maps have recorded relevant details of the Mohs' procedure in patient's paper records with no recording of the histological findings other than retainment of Mohs' slides done to variable standards. This practice has been found to be cumbersome, inefficient and difficult to access at multi site specialty hospitals and when patients travel to different areas. As a measure of increasing efficiency, accuracy and multisite data availability whilst maintaining patient confidentiality amidst a governmental drive favoring electronic patient records and paperless practice we have devised the electronic Mohs' map (EMM) and have been successfully using this for 5 years.

DESIGN: A photograph of the surgical site and lesion is taken prior to the procedure on the day of Mohs' surgery and subsequent photos of individual stages are taken sequentially thereafter. These images are transferred on to a Powerpoint ® (Microsoft Office 2003) slide thereafter on a standard hospital desktop and numbered sequentially. The individual stages and reference nicks are drawn to scale on the individual images and important visible structures including remnant tumour deposits are marked accurately on the EMM. This process is repeated until tumour clearance is achieved. The histopathological microscopic image of the type of tumour and remnant tumour areas including other relevant findings are recorded with corresponding stages. The type of reconstruction or external referral department for reconstruction is also recorded with the EMM sent electronically to the external team. The EMM requires a departmental camera and some time to electronically record data, this being no more usually than using pen and paper in those with basic computer proficiency.

CONCLUSION: This method of electronic Mohs' surgery data recording allows accuracy, efficiency and reproducibility in Mohs' surgical practice with easy recordabilty in patients' hospital electronic records and databases. The EMM allows ease in data retrieval for Mohs' surgical audit and research and quality assurance measures, which are increasingly becoming the mainstay of safe and effective Mohs' surgical practice. With the age of tablet computers being used in both hospitals and practices for data recording, easy transportability and applications available for free-hand drawing on pre set templates accurately defining head and neck anatomical structures in a three dimensional manner higher data recording accuracy can be achieved. The EMM also may help in improving the standards of Mohs' surgical practice and allow greater transparency in practice. We hope to share our successful EMM and discuss the advantages and disadvantages of its use in clinical practice today and in the future.

4:00 – 4:06 PM

PRESENTER: Anna Drosou, MD

TITLE: **Second Intention Healing of Post-operative Defects of the Lower Eyelids**

AUTHORS: Anna Drosou, MD[1]; Diane Trieu, MD[1]; Leonard H. Goldberg, MD[1,2]

INSTITUTIONS: 1. DermSurgery Associates, Houston, TX, United States 2. Weill Cornell Medical College, Department of Dermatology, Dermatology, Houston, TX, United States

PURPOSE: Many Mohs surgeons routinely refer defects of the eyelids to oculoplastic surgeons for repair. Patients that undergo oculoplastic repair usually require general anesthesia and operating room time, thus increasing the patient morbidity and cost. Some of these procedures

might be prevented, if second intention healing of the lower eyelid can render satisfactory results. We evaluated the functional and cosmetic results of second intention healing of post-operative defects of the lower eyelid.

SUMMARY: 10 patient charts that met the inclusion criteria were identified and evaluated (Table1). Four patients had full thickness defects of the eyelid. The sizes of the defects varied from 0.6 to 2.3 cm. All patients had satisfactory cosmetic results, with 4 having excellent post operative appearance. Five patients developed mild notching and the majority of the patients were devoid of eyelashes at the surgery site. One patient developed trichiasis. Noticeably, that was the patient with the longest full thickness defect (2.3cm). No ectropion, entropion, infection, epiphora, exposure keratopathy or other adverse event were recorded. Figure 1: Pictures immediately post operatively and at the follow up visit of patients that we found to have excellent cosmetic results. Figure 2: Pictures immediately post operatively and at the follow up visit of patients that we found to have good cosmetic results.

DESIGN: Retrospective chart review was performed on patients with previous Mohs Surgery on the lower eyelid from 2010-2013. We included patients that had post-Mohs surgery defect on their lower eyelids, with mucosal involvement, left to heal by second intention, and for whom pictures of the day of the surgery and of the follow up visit and were available. Ectropion, entropion, notching, cosmetic result, ability to completely close the eyelid, and presence of eyelashes on the scar, were evaluated by 2 independent dermatologists. Any other adverse event was also recorded.

CONCLUSION: Partial thickness and small full thickness defects of the lower eyelid heal well by second intention with excellent functional and cosmetic results, sparing the financial cost and morbidity associated with the additional reconstructive surgery.

Table 1. Second intention healing for eyelid wounds

Pt	Age /Sex	Defect thickness (Full vs. partial)	Defect size (cm)	Post-op notching (0 -3 scale)	Ability to close the eyelid (complete vs non complete)	Ectropion/ Entropion (Yes or No)	Cosmetic result (0-5 scale)	Presence of eyelashes on scar	Other adverse events
1	64 M	FT	0.8x0.7	1	C	No	3.5	No	none
2	72F	PT	0.6x0.4	0	C	No	5	No	none
3	75F	PT	0.9x0.5	1	C	No	3.5	No	none
4	70F	PT	0.6x0.4	0	C	No	5	N o	none
5	71M	FT	1.2x0.6	1.5	C	No	3.5	No	none
6	69F	PT	0.3x0.8	0	C	No	5	No	none
7	50F	FT	1.2x0.6	0	C	No	5	No	none
8	41M	PT	1.8x0.9	1	C	no	4.5	No	none
9	46M	PT	0.9x1.0	0	C	No	5	Yes	none
10	84F	FT	2.3x0.6	1	C	No	3.5	No	trichiasis

Scale for Post-op notching:
0- no notching, 1-minimal notching, 2-noticable notching, 3-marked notching

Scale for cosmetic results:
0- poor, 1-unsatisfactory, 2-satisfactory, 3-good, 4-very good, 5-excellent

Figure 1.

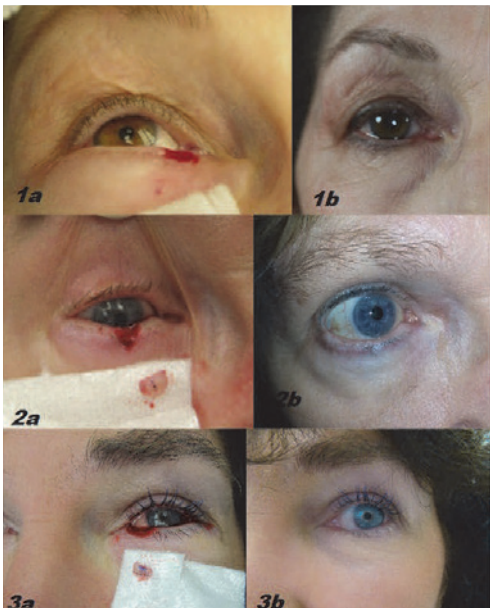
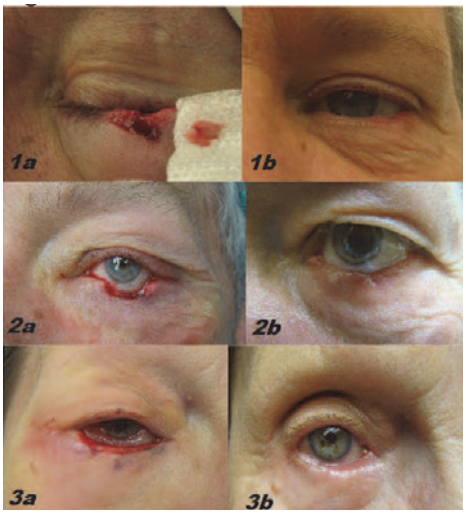


Figure 2.



4:06 – 4:12 PM

PRESENTER: Helen A. Raynham, MD

TITLE: **Expanding the Use of the Rotation Flap – A Reconstructive Series of 62 Mohs Defects of the Distal Nose**

AUTHOR: Helen A. Raynham, MD[1]

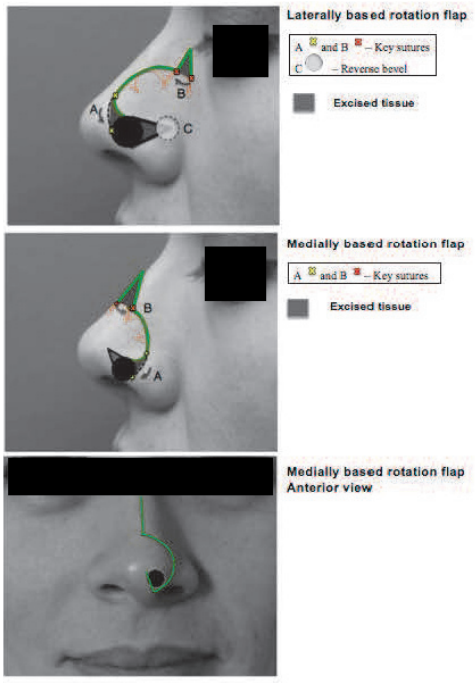
INSTITUTION: 1. Northeast Surgery Center, Chelmsford, MA, United States

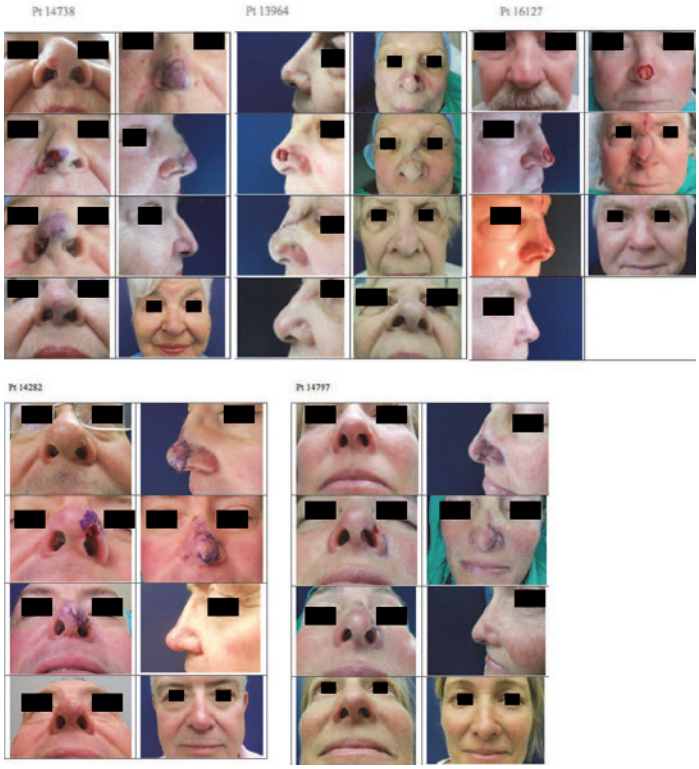
PURPOSE: Distal nasal Mohs defects are challenging to reconstruct. Bilobed and trilobed flaps are transposition flaps frequently used to repair such defects, but require meticulous execution, and can be complicated by bulldozing and pincushioning. We describe a rotation flap, which has a design based upon the bilobed and trilobed flaps. The flap is utilized for nasal soft triangle, supratip, tip, and alar defects.

SUMMARY: 62 patients in whom the rotation flap was performed were identified. The flap was used to reconstruct defects located on the soft triangle, ala, nasal tip and supratip. Sizes of defects ranged from 0.6 – 2.1 cm. 44 out of 62 flaps (71%) were templated on a trilobed design. 55 out of 62 flaps (89%) were laterally based. 42% of defects were located on the nasal tip. In 5 of 7 soft triangle defect repairs, the flap was medially based and the incision could be hidden distally along the lateral nasal tip margin, and proximally along the mid nasal bridge. The majority of rotation flaps required no revision.

DESIGN: We describe the design of a rotation flap, based on the key features of the bilobed and trilobed flaps. A retrospective analysis was performed of all such rotation flaps for distal nasal defects executed over an 18-month period. The size and specific location of the Mohs defects were documented. Flaps were designed with a medial or lateral base and in each case the rotation flap was templated upon 2, 2.5 or 3 lobes. Clinical photographs were taken before, during and after surgery. Flaps were assessed for alar distortion, and pincushioning.

CONCLUSION: The rotation flap, based on the trilobed and bilobed template, is a versatile single stage flap which can be used for distal nasal defects, including the soft triangle. It is flexible in design, robust with a broad base, and demonstrates minimal pincushioning. The execution is more straightforward and rapid than a bilobed or trilobed flap, leading to more consistent cosmetic outcomes. With tissue movement being rotational, it minimizes the "bulldozing" effect and subsequent alar depression sometimes noted when utilizing transposition flaps.





4:12 – 4:18 PM

PRESENTER: Glen M. Bowen, MD

TITLE: **Purse String Excisional Biopsies Followed by Topical Imiquimod 5% Cream then Staged Excisions for Reducing the Surgical Morbidity of Lentigo Maligna**

AUTHORS: Glen M. Bowen, MD[1]; Mark A. Hyde, PA[1]

INSTITUTION: 1. University of Utah, Department of Dermatolgoy, Salt Lake City, UT, United States

PURPOSE: Lentigo maligna (LM) requires an average 7.1 mm margin to confirm tumor extirpation which leads to substantial surgical morbidity in terms of surgical defect sizes. In order to decrease the size of the surgical morbidity, we have previously published on the off-label use of neo-adjuvant topical imiquimod 5% cream followed by conservative staged excisions with 2 mm margins. There have been two prior reports of LM referred for surgery where 16% of tumors harbored invasion and were re-classified as lentigo maligna melanoma. For this reason, it has been our practice to remove all of the visible LM to rule out invasion before embarking on topical therapy.

DESIGN: Of all the excisional biopsy techniques, an excisional biopsy followed by a 360° purse string closure has the advantage of shrinking the treatment site down to a few millimeters. When feasible, we remove all of the visible tumor with a 15-C scalpel and close the site with either a purse string or double purse string repair. If no invasion is found on histologic review, we allow the biopsy site to heal for 4 to 8 weeks and then apply topical imiquimod 5% cream to the site with a three centimeter margin for 8 to 12

weeks depending on the degree of elicited inflammation. A period of 2 months is then allowed for the inflammation to subside and then a conservative staged excision is performed beginning with 2 mm margins with radial sections and immunostaining with Mart-1, MITF, and routine staining with hematoxylin and eosin.

CONCLUSION: To date, we have treated 571 LM lesions with topical imiquimod 5% cream followed by staged excisions with 2 mm margins and recorded a local recurrence rate of 1.2%. By removing all of the visible tumor surface area with an excisional biopsy and closing with a purse string, the amount of tissue that must ultimately be removed to confirm negative histologic margins is minimized with decreased surgical morbidity.

4:18 – 4:24 PM

PRESENTER: Betty A. Hinderks Davis, MD

TITLE: **Value Based Care and Mohs/Dermatology**

AUTHOR: Betty A. Hinderks Davis, MD[1]

INSTITUTION: 1. Banner Health, Sun City West, AZ, United States

PURPOSE: "Value-based care" seems to be the buzz slogan of the day. How this will affect health care delivery of the future is still largely unknown and the future of Mohs surgery is potentially at risk. Trends are evolving now and will continue to be guided by costs, patient outcomes, government regulations, and consumerism. So how do we keep Mohs (and dermatology) valuable in the eyes of both consumers and payors?

SUMMARY: As a physician member of a Pioneer ACO, as well as a member of multiple commercial "value-based" plans, I have been able to work with these groups to enhance value-based care both at a primary care and specialty level. Observations in my clinic which is a 50% Mohs/50% general dermatology practice are as follows.

DESIGN: First, counseling on treatment options (shared decision-making) revealed patients who were more comfortable with lesser surgical procedures or no treatment and when appropriate, we were able to respect those wishes. Second, same-day appointments were made available to our general dermatology patients decreasing cost and increasing patient satisfaction. Third, decreasing variability by implementing and standardizing best practices enhance patient safety and reliability. Forth, instituting a team-based approach for skin checks with primary care to decrease cost. Fifth, opening our office to Family Practice residents to enhance our connection to and influence over education. We then looked outward to see how we could contribute more broadly to a value-based system. We began a dermatologic consultation system in the emergency departments. We worked with a team to develop and launch telemedicine and teledermatology. We worked with an Intensive Ambulatory Care program, a primary care program which enrolls patients with the top 5% spend of ACO dollars, and placed a medical team (including dermatology expertise) around these individuals 24/7 to stabilize their health and decrease readmissions and trips to the emergency departments. We were asked to participate with our at-risk contracting entity and a local hospital to create a "neighborhood" approach to patient care coordination and value-based intervention. Cost data were analyzed to determine the largest areas of cost to the system of value-based contracts. We found that the three most expensive interventions in this population are for orthopedics, cardiology, and oncology. Dermatology is the fourth most expensive intervention for the population. Currently we are creating value-based programs around reducing costs for the top three spends, but dermatology cannot be far behind.

CONCLUSION: It is my belief that the best way to influence health care's future is from the inside as an engaged, active and influential partner with systems and payors. As dermatologists and Mohs surgeons, it is obvious how we add value to the consumer and how we are able to add value to the system as a whole.

Poster Presentation List

Posters will be displayed inside the Exhibit Hall. Posters will be displayed from 11:00 am Thursday, May 1 through 2:00 pm Saturday, May 3.

Authors have been requested to stand by their poster to answer any questions during the following timeframes:

Even Number Posters (002 – 054):
Thursday, May 1 from 12:00 – 1:00 pm

Odd Number Posters (001 – 055):
Saturday, May 3 from 12:00 – 1:30 pm

001

Administration of Local Anesthesia by Surgical Assistants
Heidi M. Hermes, MD[1]; Timothy S. Wang, MD[1]
1. Johns Hopkins Hospital, Department of Dermatology, Baltimore, MD, United States

002

Increasing Incidence of Melanoma among Middle Aged Adults: A Population-based Study in Olmsted County, Minnesota
Garrett Lowe, MD[1]; Alexandra Saavedra-Garcia, MS[1]; Ana Valazquez, Medical Student[1,2]; Roxana Dronca, MD[1]; Svetomir Markovic, MD[1]; Jerry D. Brewer, MD[1]
1. Mayo Clinic, Rochester, MN, United States
2. University of Puerto Rico, School of Medicine, San Juan, PR, United States

004

Cutaneous Depth of the Supraorbital Nerve: A Cadaveric Study with Clinical Applications to Dermatology
Kevin N. Christensen, MD[1]; Nirusha Lachman, PhD[2]; Christian L. Baum, MD[1]
1. Mayo Clinic, Department of Dermatology, Rochester, MN, United States
2. Mayo Clinic, Department of Anatomy, Rochester, MN, United States

005

Mohs Micrographic Surgery versus Wide Local Excision for Malignant Melanoma of the Head and Neck: A 10 Year Retrospective Study
Karl K. Vance, MD[1]; Addison M. Demer, BS[1]; Matthew W. Beal, MD[1]; Hilary C. Reich, MD[1]; Sarah Schram, MD[1]; Samir S. Khariwala, MD[1]; Peter K. Lee, MD, PhD[1]
1. University of Minnesota, Department of Dermatology, Minneapolis, MN, United States
2. University of Minnesota, Department of Otolaryngology, Minneapolis, MN, United States

006

The Utility of Single-Stage Interpolation Flaps for Soft Tissue Reconstruction of the Head and Neck
S. Tyler Hollmig, MD[1]; Brian C. Leach, MD[1]; Joel Cook, MD[1]
1. Medical University of South Carolina, Department of Dermatology, Charleston, SC, United States

007

Modified C-V Flap for Complete Nipple Loss Following Mohs Surgery
Joseph F. Sobanko, MD[1]
1. University of Pennsylvania, Philadelphia, PA, United States

008

Work Habits and Safety Issues among Mohs Histotechnicians: A Survey of Mohs Histotechnicians in 2013
Nicole F. Velez, MD[1]; Kachiu C. Lee, MD, MPH[3]; Alyssa B. Findley, MD[1]; Susan Sweeney, MD[1,2]; Nathaniel J. Jellinek[1,3]
1. Dermatology Professionals, Inc., East Greenwich, RI, United States
2. University of Massachusetts Medical School, Division of Dermatology, Worcester, MA, United States
3. Brown University, Department of Dermatology, Providence, RI, United States

009

Risk of Primary Cutaneous Malignancies Following Diagnosis of Merkel Cell Carcinoma: A Population-Based Study
Michael B. Chang, MD[1]; Amy Weaver, Statistician[1]; Jerry D. Brewer, MD[1]
1. Mayo Clinic, Rochester, MN, United States

010

Familiarity of Mohs Micrographic Surgery among Family Physicians
Abdel Kader El Tal, MD[1]; Katherine L. Caretti, MD[1]; David A. Mehregan, MD[1]
1. Wayne State University School of Medicine, Department of Dermatology, Dearborn, MI, United States

011

A Comparison of Same-day Pre-operative Evaluation to Different-day Pre-operative evaluation for Mohs Micrographic Surgery: Outcomes and Complication Rates
Nkanyezi N. Ferguson, MD[1]; Adam Asarch, MD[1]; Marta VanBeek, MD, MPH[1]
1. University of Iowa Hospitals & Clinics, Department of Dermatology, Iowa City, IA, United States

012

Comorbidity Assessment in Skin Cancer Patients: A Pilot Study Comparing Medical Interview with a Patient Reported Questionnaire

Kishwer S. Nehal, MD[1]; Rajiv I. Nijhawan, MD[1]; Erica H. Lee, MD[1]; Stephen W. Dusza, DrPH[1]; Amanda Levine, BS[2]; Amanda Hill, RN[2]; Christopher Barker, MD[2]
1. Memorial Sloan Kettering Cancer Center, Department of Dermatology, New York, NY, United States
2. Memorial Sloan Kettering Cancer Center, Department of Radiation Oncology, New York, NY, United States

013

Histologic Findings on Mohs Frozen Sections: Granulomatous Inflammation in a Patient undergoing BRAF/MEK Inhibition Therapy

David L. Chen, MD[1]; Rene Gonzalez, MD[2]; Joshua Wisell, MD[3]; Mariah R. Brown, MD[3]
1. University of Colorado Health Center, Department of Dermatology, Aurora, CO, United States
2. University of Colorado Health Center, Department of Cutaneous Oncology, Aurora, CO, United States
3. University of Colorado Health Center, Aurora, CO, United States

014

Increased Mortality in Transplant Recipients with a History of Pretransplant Melanoma

Sarah T. Arron, MD, PhD[1], Elizabeth Yanik, PhD[2], Amanda Raymond, MD[1], Charles McCulloch, PhD[3]; Eric Engels, MD[2]
1. University of California, San Francisco, Department of Dermatology, San Francisco, CA, United States
2. NIH/NCI, Bethesda, MD, United States
3. University of California, San Francisco, Department of Epidemiology and Biostatistics, San Francisco, CA, United States

015

Hyaluronic acid filler--Not to be Confused with Mucin from Basal Cell Carcinoma: 16 Mohs surgery cases (2003-2013)

Erik S. Cabral, MD[1]; Ryan M. Spivak, MD[2]; Elizabeth K. Shim, MD[1]
1. Bennett Surgical Center, Santa Monica, CA, United States
2. University of Southern California, Division of Plastic Surgery, Los Angeles, CA, United States

016

Utility of Wood's Light in Margin Determination of Melahoma In-situ

Stephanie B. Walsh, MD[1]; Rajat Varma, MD[2]; David W. Raimer, MD[3]; James C. Keane, MD[4]; Alan Cantor, PhD[5]; Conway C. Huang, MD[1]
1. University of Alabama, Birmingham, Department of Dermatology, Birmingham, AL, United States
2. University of North Carolina, Department of Dermatology, Chapel Hill, NC, United States
3. Private Practice, Galveston, TX, United States
4. Private Practice, Shreveport, LA, United States
5. University of Alabama, Birmingham, Division of Preventive Medicine, Birmingham, AL, United States

017

Optical Coherence Tomography: Clinical Applications in Diagnosis of Non-melanoma Skin Cancers

Andrea M. Hui, MD[1]; Daniel M. Siegel, MD[1]; Orit Markowitz, MD[1]
1. SUNY Downstate, Department of Dermatology, Brooklyn, NY, United States

018

A Comparison of Super Wide Field Microscopy Systems in Mohs Surgery

Anne J. Goldsberry, MD, MBA[1]; C. William Hanke, MD, MPH[1]; Nicholas B. Countryman, MD, MBA[1]
1. Laser and Skin Surgery Center of Indiana, Carmel, IN, United States

019

Effect of Wait Times on Surgical Defect Size in Patients Undergoing Mohs Micrographic Surgery

Joseph Diel, MD[1]; Li-Jung Liang, PhD[2]; Teresa T. Soriano, MD[1]; Melvin Chiu, MD[1]
1. University of California, Los Angeles, Division of Dermatology, Los Angeles, CA, United States
2. University of California, Los Angeles, Department of Medicine-GIM, Los Angeles, CA, United States

020

Retrospective evaluation of the safety of large skin flap, large skin graft and interpolation flap surgery in the outpatient setting

Jennifer L. DePry, DO[1]; Adam R. Schmitt, BA[2]; Jeremy S. Bordeaux, MD, MPH[1]
1. University Hospitals Case Medical Center, Department of Dermatology, Cleveland Heights, OH, United States
2. Case Western Reserve University, School of Medicine, Cleveland, OH, United States

Poster Presentation List

021

The Incision for the Melolabial Transposition Flap should be made above the Melolabial Crease and Not Within It

Ryan M. Spivak, MD[1]; Steven Chow, MD[2]; Richard G. Bennett, MD[2];
1. University of Southern California, Division of Plastic Surgery, Los Angeles, CA, United States
2. University of Southern California, Dermatology, Keck School of Medicine, Los Angeles, CA, United States

023

Biopsy Site 'Selfies' - A Pilot Study for Wrong Site Surgery Prevention

Rajiv I. Nijhawan, MD[1]; Kishwer S. Nehal, MD[1]; Erica H. Lee, MD[1]
1. Memorial Sloan Kettering Cancer Center, Department of Dermatology, New York, NY, United States

024

Prevention of Wrong Site Surgery via Implementation of an Institutional Pre-biopsy Photography Protocol

Elizabeth L. Noble, MD[1]; Faith M. Whalen, MD[1]; Howard Pride, MD[1]; Mary G. Petrick, MD[1]; Michael L. Ramsey, MD[1]; Victor J. Marks, MD[1]
1. Geisinger Medical Center, Department of Dermatology, Danville, PA, United States

025

Benchmarks in an Academic Mohs Surgery Practice

Elizabeth Zeeck, MD[1]; Glenn D. Goldman, MD[1]
1. Fletcher Allen Health Care, Department of Dermatology, Burlington, VT, United States

026

Cutaneous Tensile Strength Augmentation

Bailey Tayebi, MB, MBA[1]; Dana Mondo, MD[1]; Rebecca C. Tung, MD[2]
1. Loyola University, Maywood, IL, United States
2. Loyola University, Division of Dermatology, Maywood, IL, United States

027

Changing Characteristics in Females receiving Mohs Micrographic Surgery for Non-melanoma Skin Cancer

Joanna L. Walker, MD[1]; Kachiu C. Lee, MD, MBE[1]; Olivia Linden, BA[1]; Antonio P. Cruz, MD[1]
1. Brown University, Department of Dermatology, Providence, RI, United States

028

Perioperative Antiseptic Practices in Mohs Micrographic Surgery: An ACMS Member Survey

Lindsey K. Collins, MD[1]; Thomas J. Knackstedt, MD[2]; Faramarz H. Samie, MD, PhD[2]
1. Dartmouth-Hitchcock Manchester, Lebanon, NH, United States
2. Dartmouth-Hitchcock Medical Center, Department of Dermatology, Lebanon, NH, United States

029

Assessment of the National Comprehensive Cancer Network (NCCN) Treatment Recommendations for Cutaneous Squamous Cell Carcinoma (cSCC): Single-institution Experience

Melinda B. Chu, MD[1]; Eric S. Armbrecht, PhD[2]; Brandon T. Beal, BS[3]; Mark A. Varvares, MD, FACS[4]; Scott W. Fosko, MD[1]
1. Saint Louis University, Department of Dermatology, St. Louis, MO, United States
2. Saint Louis University, Center for Outcomes Research, St. Louis, MO, United States
3. Saint Louis University, School of Medicine, St. Louis, MO, United States
4. Saint Louis University, Otolaryngology-Head and Neck Surgery, St. Louis, MO, United States

030

Detecting Spindle Cell Squamous Cell Carcinomas with Toluidine Blue

Diane N. Trieu, MD[1]; Anna Drosou, MD [1]; Arash Kimyai-Asadi, MD[1]; Leonard H. Goldberg, MD[1,2]
1. DermSurgery Associates, Houston, TX, United States
2. Weill Cornell Medical College, Department of Dermatology, Houston, TX, United States

031

Nail Surgery among Mohs Surgeons: Prevalence, Safety and Practice Patterns

Alyssa Findley, MD[1]; Nathaniel Jellinek, MD[1,2]; Nicole F. Velez, MD[1]; H. William Higgins, MD, MBE[3]
1. Dermatology Professionals, Inc., East Greenwich, RI, United States
2. University of Massachusetts Medical School, Division of Dermatology, Worcester, MA, United States
3. Brown University, Department of Dermatology, Providence, RI, United States

032

The Purse-string Bipedicle Combination Flap for the Repair of Scalp Defects Following Mohs Surgery

Kenny J. Omlin, MD[1]; Faranak Kamangar, MD[1]
1. University of California, Davis, Department of Dermatology, Davis, CA, United States

Poster Presentation List

033

Assessing the Predictive Probability of Melanoma Using Data Provided by a Multispectral Digital Skin Lesion Analysis Device

Jane Yoo, MD, MPP[1]; Natalie Tucker, BA[2]; Darrell Rigel, MD, MS[3]
1. Albert Einstein College of Medicine, Department of Dermatology, New York, NY, United States
2. Mela Sciences, Inc., Irvington, NY, United States
3. New York University, Langone Medical Center, New York, NY, United States

034

Angioinvasive Cutaneous Squamous Cell Carcinoma on the Scalp: A Case Report and Review of the Literature

Megan Morrison, DO[1]; Kent J. Krach, MD [1,2]
1. St. Joseph Mercy Hospital, Ypsilanti, MI, United States
2. Midwest Skin Cancer Surgery Center, Clinton Township, MI, United States

035

Two-Staged Bilobed Interpolated Flap (Nasal Sidewall-to-Ala Interpolation Flap or Nose-to-Nose Interpolation Flap)

Cynthia Abban, MD, PhD[1]; Hakeem Sam, MD, PhD[1]
1. University of Pittsburgh, Department of Dermatology, Pittsburgh, PA, United States

036

In-transit Metastasis of Squamous Cell Carcinoma in the Setting of Herpes Zoster

Abigail H. Baird, MD[1]; H. William Higgins, II, MD, MBE[1]; David J. Leffell, MD[1]
1. Yale University School of Medicine, Department of Dermatology, New Haven, CT, United States

037

Treatment of Dermatofibroma Sarcoma Protuberans Using Modified Mohs Micrographic Surgery

Vineet Mishra, MD[1]; Lee Miller, MD[2]; Ben Kelley, MD[2]; John G. Hancox, MD[2]; Hubert T. Greenway, Jr., MD[2]
1. University of Texas, San Antonio, TX, United States
2. Scripps Clinic, La Jolla, CA, United States

038

Role of Human Papillomavirus in Cutaneous Squamous Cell Carcinoma: A Meta-analysis

Bishr Al Dabagh, MD[1]; Justin Yu, BS[2]; Jennifer Wang, BS[3]; Sarah T. Arron, MD, PhD[1]
1. University of California, San Francisco, Department of Dermatology, San Francisco, CA, United States
2. Saint Louis University, Department of Dermatology, St. Louis, MO, United States
3. New York University Medical Center, Department of Dermatology, New York, NY, United States

039

Basaloid Folliculolymphoid Hyperplasia in the Setting of Erythrodermic Sezary Syndrome

Paul C. Jou, MD[1]; Karl K. Vance, MD[1]; Valda N. Kaye, MD[2]; Sarah E. Schram, MD[1]
1. University of Minnesota, Department of Dermatology, Minneapolis, MN, United States
2. Twin Cities Dermatopathology, Plymouth, MN, United States

040

Wound Infection Rates Associated with Mohs Micrographic Surgery for Squamous Cell Carcinoma with Aggressive Subclinical Extension in Immunocompromised Smokers

Alina Goldenberg, BA[1]; Arisa Ortiz, MD[1]; S. Brian Jiang, MD[1]
1. University of California, San Diego, Department of Dermatology, La Jolla, CA, United States

041

Same-day Erbium: YAG Laser Resurfacing to Improve Second Intention Healing after Mohs Micrographic Surgery on the Nose and Forehead

Christopher R. Urban, MD[1]; M. Laurin Council, MD[2]; Eva A. Hurst, MD[2]
1. Washington University, Department of Dermatology, St. Louis, MO, United States
2. Washington University, Center for Dermatologic and Cosmetic Surgery, St. Louis, MO, United States

042

Dermoscopy for Non-surgical Post-treatment Follow-up of Bowen's Disease

Shih-Tsung Cheng, MD[1]; Yi-huey Cheng, Senior Medical Student[2]; Stephen C-S Hu, MD[1]; Chiao-Li K. Ke, MD[3]
1. Kaohsiung Medical University and University Hospital, Department of Dermatology, Faculty of Medicine, Kaohsiung, Republic of Taiwan
2. Kaohsiung Medical University, Kaohsiung, Taiwan, Republic of Taiwan
3. Kaohsiung Medical University, Department of Psychiatry, Kaohsiung, Taiwan, Republic of Taiwan

043

Take the Sutures Out: An Essential Salvage Maneuver for Flaps with Venous Congestion

Ryan M. Spivak, MD[1]; Erik S. Cabral, MD[2]; Richard G. Bennett, MD[2,3]
1. University of Southern California, Division of Plastic Surgery, Los Angeles, CA, United States
2. Bennett Surgical Center, Santa Monica, CA, United States
3. David Geffen School of Medicine at UCLA, Los Angeles, CA, United States

Poster Presentation List

044

Primary Cutaneous Adenosquamous Carcinoma Mimicking Mucoepidermoid Carcinoma

Anthony V. Benedetto, DO[1,2]; Abhishek Aphale, MD[1]
1. Dermatologic SurgiCenter, Philadelphia, PA, United States
2. Perelman Center for Advanced Medicine, Philadelphia, PA, United States

045

Use of Nasalis Hinge Flap and Full Thickness Skin Graft for Reconstruction of Partial Thickness Nasal Supratip and Tip Wounds

Eleanor Higgins, MB, BCh, BAO, MRCPI[1]; Rupert Barry, MD, MRCPI[1]
1. St. James' Hospital, Department of Dermatology, Dublin, Ireland

046

Informed Consent, Use, and Storage of Digital Photography among Mohs Surgeons and Academic Dermatologists in the US

Michael D. Sarradet, MD[1]; Sasha Jenkins, MD, MPH[1]; Benjamin Stoff, MD[1]; Laura DeLong, MD, MPH[1]; Jane Grant-Kels, MD[2]; Virginia A. Moye, BS[3]
1. Emory University School of Medicine, Department of Dermatology, Atlanta, GA, United States
2. University of Connecticut Health Center, Farmington, CT, United States
3. UNC Chapel Hill School of Medicine, Chapel Hill, NC, United States

047

A Therapeutic Approach to Invasive and In-situ Squamous Cell Carcinomas arising in a Patient with Hydroxyurea-associated Non-melanoma Skin Cancers

Emily F. Stamell, MD[1]; Joshua Berger, MD[1]; Ryan B. Turner, MD[1]
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048

Vismodegib Resistance after Successful Treatment of Basal Carcinomas in Gorlin Syndrome

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049

Multiple Keratoacanthomas Presenting as Pruigo Nodularis in Chronic Lichenified Dermatitis

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050

Characteristics of Large Basal Cell Carcinomas Removed with Mohs Micrographic Surgery: A 10 Year Experience

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051

Comparison of Full Thickness Skin Grafts versus Second Intention Healing for Mohs Defects of the Helix

Phillip C. Hochwalt, MD[1]; Kevin N. Christensen, MD[1]; Sean Cantwell, BS[1]; Christian L. Baum, MD[1]; Jerry D. Brewer, MD[1]; Christopher J. Arpey, MD[1]; Clark C. Otley, MD[1]; Randall K. Roenigk, MD[1]
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052

Double Island Pedicle Flap Repair for Combined Lip Defects

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053

Putting the Lid on Wound Contamination

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054

Pexing Sutures Combined with Secondary Intention Healing for Nasal Defects and Internal Nasal Valve Function Loss; a Novel Reconstructive Approach

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055

5-mm Surgical Margins are Adequate for Non-lentiginous Melanoma In-situ

Keith L. Duffy, MD[1]; Amanda Truong, BS[2]; Scott R. Florell, MD[3]; Anneli R. Bowen, MD[3]; David Wada, MD[3]; Glen M. Bowen, MD[1]; Douglas Grossman, MD, PhD[3]

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001

TITLE: Administration of Local Anesthesia by Surgical Assistants

AUTHORS: *Heidi M. Hermes, MD[1]; Timothy S. Wang, MD[1]*

INSTITUTION: 1. Johns Hopkins Hospital, Department of Dermatology, Baltimore, MD, United States

PURPOSE: In an effort to increase our clinic's efficiency while preserving patient safety, we sought to formally train and certify our surgical assistants to proficiently administer local infiltrative anesthesia. For years, private and academic institutions have utilized ancillary staff to administer local anesthesia to patients prior to outpatient surgery. However, formal training and coursework in these tasks are lacking in the literature.

DESIGN: Although permitted by state and local regulation, ancillary staff in our large academic institution's outpatient center did not administer local anesthesia to patients. After meeting with nursing administration this was determined to be largely historical. We developed a formal curriculum to educate, evaluate, certify and ultimately recertify ancillary staff to administer local anesthesia. This process meets our institution's regulatory requirements and is modeled after the process used to certify dental hygienists in the administration of local anesthesia. Initial certification has three components: required readings, a written exam, and a clinical exam. Required readings include selected journal articles and a 12 page curriculum that we developed specifically for dermatologic surgery. This curriculum discusses skin anatomy, basic chemistry and mechanism of action of local anesthetics, additives, technique, side effects and relative contraindications. Comprehension of the required reading material is evaluated through a written exam. After successfully completing the written exam, a clinical exam is given where the assistant administers local anesthesia to a volunteer test subject. The clinical exam is supervised and graded by the supervising physician using a comprehensive checklist (Figure 1). After passing these three components, the assistant receives initial certification. This allows for the administration of local anesthesia on carefully selected patients for sites on the trunk and extremities. Over the following weeks, the assistant is supervised closely at the bedside. We developed a flow-sheet (Figure 2) that tracks their progress and as their knowledge and skills improve, they are allowed to anesthetize in other areas of the body with the ultimate goal being to allow them to anesthetize any area that the supervising surgeon deems appropriate including sites on the head and neck. Once certified, the assistant is expected to stay proficient in their skills and knowledge and is recertified annually.

CONCLUSION: We developed a curriculum to formally educate our surgical assistants to administer local anesthesia prior to office based procedures. We also developed a process to document initial certification and yearly recertification. This curriculum may serve as a template for others to develop an education plan to train ancillary staff to administer infiltrative local anesthesia.

Administration of Local Anesthesia by Surgical Assistants

Certification Flowsheet

Name: _____

1) *Required reading*
   - ○ Principles of Local Anesthesia curriculum
   - ○ Journal Articles

2) *Written Exam*
   - ○ Score: _____ _____(Passing 80%)

3) *Clinical Exam*
   - ○ See checklist

Date of Initial Certification: _____

4) *Procedurol Sign-off*

Site	Date	Evaluator Initials
Trunk/Extremities		
Trunk/Extremities		
Trunk/Extremities		
Scalp		
Scalp		
Scalp		
Forehead/Cheeks/Neck		
Forehead/Cheeks/Neck		
Forehead/Cheeks/Neck		

5) *Notes/comments/feedback:*

_____

_____

_____

_____

_____

_____

_____

Practical Exam Checklist

Date:					
State patient's name and purpose of visit					
Patient History					
Ask about allergies					
Ask about prior difficulty with anesthesia					
Is the patient pregnant or breastfeeding?					
Prepare Anesthesia					
Verify label and expiration date on bottle					
Hand hygiene and gloves					
Scrub top with isopropyl alcohol					
Insert 18g needle					
Attach syringe					
Invert bottle and draw anesthesia into syringe					
Place 30g needle on syringe					
Discard 18g needle					
Properly label syringes					
Time out					
Verify name and correct site					
Position Patient					
Recline Patient					
Cover eyes with towel					
Prep the surgical site					
Hand hygiene, gloves, mask and eye shield					
Drape the area					
Clean area with isopropyl alcohol					
Infiltrate Anesthesia					
Telegraph process to patient					
Hold needle at 45°					
Place small dermal wheal					
Inject at appropriate depth					
Inject slowly					
Advance fluid wave					
Verify site is numb					
Cover area with a clean gauze square					
Monitor for adverse events					

002

TITLE: Increasing Incidence of Melanoma among Middle Aged Adults: A Population-based Study in Olmsted County, Minnesota

AUTHORS: *Garrett Lowe, MD[1]; Alexandra Saavedra-Garcia, MS[1]; Ana Valazquez, Medical Student[1,2]; Roxana Dronca, MD[1]; Svetomir Markovic, MD[1]; Jerry D. Brewer, MD[1]*

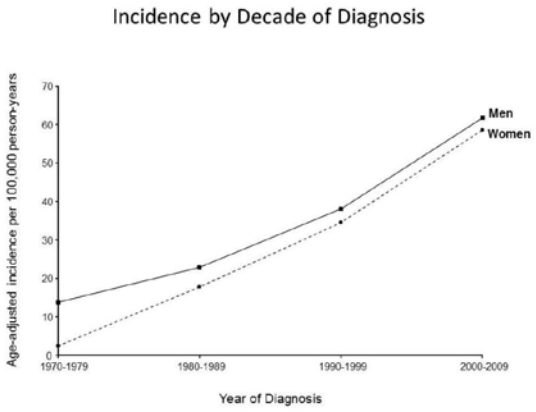
INSTITUTIONS: 1. Mayo Clinic, Rochester, MN, United States 2. University of Puerto Rico, School of Medicine, San Juan, PR, United States

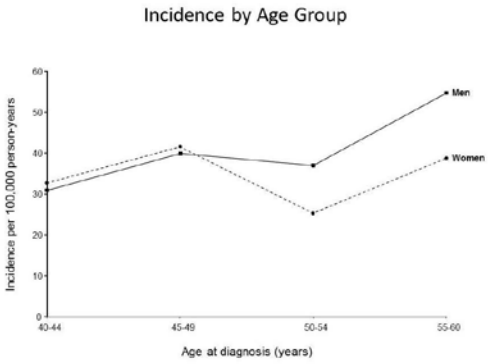
PURPOSE: To identify the change in the incidence of cutaneous melanoma over time in the fastest growing segment of the population in the United States; middle-aged adults.

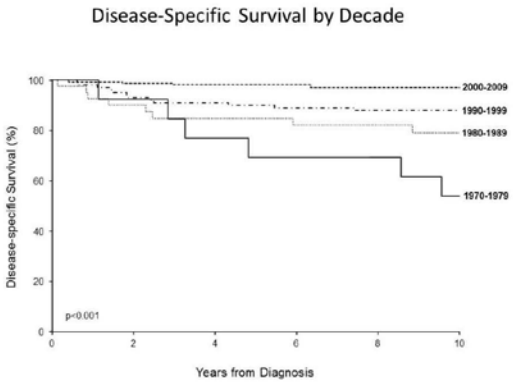
SUMMARY: Using county epidemilogical data, we identified patients aged 40 to 60 years who had a first lifetime diagnosis of melanoma from January 1, 1970 through December 31, 2009. Incidence of melanoma and overall and disease-specific survival rates were compared by sex, stage of disease, age, and decade of diagnosis.

DESIGN: 383 patients, 181 females and 202 men, with a first lifetime diagnosis of melanoma were included in this study. The overall age-and sex-adjusted incidence of melanoma for adults 40-60 years old was 37.1 per 100,000 person-years. Although not significant (p=0.061), trends for an increase in incidence with age were observed; rates being greater in women up to 50 years and much greater in men after this age. Incidence increased significantly with time (p<0.001) for both women and men, increasing from 7.9 to 60.0 per 100,000 person-years from 1970 to 2009, adjusted for sex and age. However, overall and disease-specific survival improved over time, with hazard ratios of 0.94 (p<0.001) and 0.93 (p<0.001) for each 1-year increase on year of diagnosis, respectively. Increase in age at diagnosis was associated with increased risk of death from any cause only (hazard ratio 1.07; p=0.010); no significant association was found with disease-specific death (p=0.98) or sex (p=0.23). No patient with malignant melanoma in situ died from disease. Patients with stage II, III and IV were over 14 times more likely to die from disease compared to stage 0 or I disease (hazard ratio 14.40; p<0.001).

CONCLUSION: The incidence of cutaneous melanoma among middle-aged adults is rapidly increasing, while its mortality is decreasing. Close monitoring and active interventions to decrease risk factors in high-risk patients are necessary.







004

TITLE: Cutaneous Depth of the Supraorbital Nerve: A Cadaveric Study with Clinical Applications to Dermatology

AUTHORS: *Kevin N. Christensen, MD[1]; Nirusha Lachman, PhD[2]; Christian L. Baum, MD[1]*

INSTITUTIONS: 1. Mayo Clinic, Department of Dermatology, Rochester, MN, United States 2. Mayo Clinic, Department of Anatomy, Rochester, MN, United States

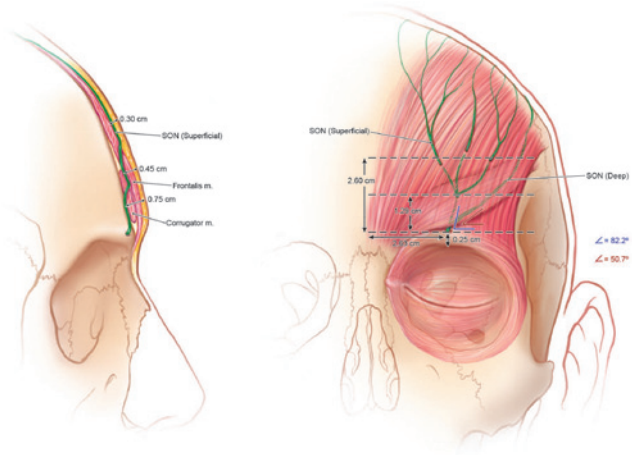
PURPOSE: Common dermatologic procedures including biopsies, excisions, Mohs surgery, and cutaneous reconstruction performed on the forehead often put the supraorbital nerve (SON) at risk for injury, potentially

leading to paresthesia and neuroma formation. Previous studies have described the frontal view course of the SON relative to facial landmarks. To date, we are not aware of any study describing SON depth. The purpose of this study is to quantify the cutaneous depth of the SON along its anatomic course through the forehead.

SUMMARY: The SON originated 2.63±0.27 cm (range 2.1-3.5 cm) from the midline and 0.25±0.02 cm (range 0-0.5 cm) above the palpable superior orbital rim (Figure 1). The SON emerged as one root that divided into a superficial branch (SON-S) and a deep branch (SON-D). The SON-D remained deep to the muscular aponeurosis and coursed laterally towards the scalp. The SON-S emerged nearly perpendicular to the palpable superior orbital rim and then traveled under the corrugator supercilii at an average depth of 0.75±0.16 cm (range 0.5-1.1 cm). The SON-S often gave rise to multiple branches within the subcorrugator plane. These branches entered the subfrontalis plane by piercing the corrugator muscle at a mean distance of 1.29±0
.20 cm (range 1.0-1.8 cm) above the palpable superior orbital rim with an average depth 0.45±0.13 cm (range 0.3-0.8 cm). These branches entered the subcutaneous plane by piercing the frontalis muscle at a mean distance of 2.60±0.32 cm (range 1.9-3.2 cm) above the palpable superior orbital rim with an average depth of 0.30±0.10 cm (range 0.2-0.6 cm). In all specimens the supratrochlear nerve was observed emerging from a separate location medial and inferior to the SON origin.

DESIGN: Sixteen embalmed cadaver specimens were dissected by retracting a hemiforehead flap from the periosteum in the cephalad to caudal direction. The supraorbital neurovascular bundle was identified near the base of the flap emerging from the superior orbital rim. Nerve branches were dissected with loupe magnification (3.8x). Measurements were made using a metric ruler and recorded to the nearest millimeter.

CONCLUSION: On average, the depth of the SON ranges from 0.75±0.16 cm at the foramen to 0.30±0.10 cm in the subcutaneous plane. Key changes of depth occur on average 1.29 cm and 2.60 cm above the orbital rim. Our data support previous reports regarding the frontal view course of the SON. Together, these results provide objective parameters to formulate a three-dimensional conceptualization of the SON. A thorough understanding of SON depth relative to anatomic landmarks may help minimize nerve damage and optimize patient counseling when performing common dermatologic procedures on the forehead.



005

TITLE: Mohs Micrographic Surgery versus Wide Local Excision for Malignant Melanoma of the Head and Neck: A 10 Year Retrospective Study

AUTHORS: *Karl K. Vance, MD[1]; Addison M. Demer, BS[1]; Matthew W. Beal, MD[1]; Hilary C. Reich, MD[1]; Sarah Schram, MD[1]; Samir S. Khariwala, MD[1]; Peter K. Lee, MD, PhD[1]*

INSTITUTIONS: 1. University of Minnesota, Department of Dermatology, Minneapolis, MN, United States 2. University of Minnesota, Department of Otolaryngology, Minneapolis, MN, United States

PURPOSE: There is a paucity of data in the literature comparing wide local excision (WLE) versus Mohs microscopic surgery (MMS) for the treatment of malignant melanoma. The purpose of this study was compare the rates of local recurrence, metastasis and tumor associated death for malignant melanoma of the head and neck treated with MMS using immunostaining versus WLE.

SUMMARY: Three hundred eighty eight melanomas of the head and neck were treated at our academic institution between January 2004 and June 2013. Two hundred ninety one were treated with MMS by Dermatologic Surgery, and 97 were treated with WLE by Head and Neck Surgery (Otolaryngology) or Surgical Oncology (General Surgery.) Average length of follow up was 26 months (range 2-117; MMS 25, WLE 30.) Overall, there were 10 local recurrences [MMS 3 of 291, (1.0%); WLE 7 of 97, (7.2%)], 23 metastases [MMS 4 of 291, (1.4%); WLE 19 of 97, (19.5%)] and 13 melanoma-related deaths [MMS 2 of 291, (0.7%); WLE 11 of 97, (11.3%)]. The majority of in situ cases were treated with MMS [MMS 220 (96.5%); WLE 8 (3.5%)]. Similar numbers of stage I cases were treated by both methods, [MMS 59 (53%); WLE 52 (47%)]. A greater number of stage II-IV cases were treated with WLE [MMS 12 (24.5%); WLE 37 (75.5%)]. Treatment with MMS resulted in lower rates of local recurrence for stage 0 and I disease [MMS 3 of 279 (1.1%); WLE 4 of 60 (6.7%) P-value 0.033] as well as stage II-IV disease [MMS 0 of 12, (0.0%); WLE 3 of 37, (8.1%)]. Rate of metastasis was also lower with treatment with MMS for stage 0 and I disease [MMS 3 of 279, (1.1%); WLE 6 of 60, (10.0%) P-value

0.005], and stage II-IV disease [MMS 1 of 12, (8.3%); WLE 13 of 37, (35.1%)]. Finally, rate of tumor associated death was lower for cases treated with MMS for stage 0-I disease [MMS 2 of 279, (0.7%); WLE 1 of 60, (1.7%)], as well as stage II-IV disease [MMS 0 of 12, (0%); WLE 10 of 37, (27.0%)].

DESIGN: Institutional review board approval was obtained. A chart review was performed of all melanomas of the head and neck treated at our institution between January 2004 and June 2013 by Dermatologic Surgery, Head and Neck Surgery, and Surgical Oncology.

CONCLUSION: For treatment of malignant melanoma of the head and neck, MMS with immunostaining resulted in lower rates of local recurrence, metastasis and tumor associated death when compared to WLE.

Comparison Rates of Local Recurrence, Metastasis, and Melanoma- related Deaths between MMS and WLE

		WLE (2004-2013)	Mohs (2004-2013)	P-Value
Stage 0	Number of patients	8	220	
	Number of local Recurrences (%)	1 (12.5)	3 (1.4)	0.1159
	Number of Metastases (%)	0 (0)	1 (0.5)	*
	Number of Melanoma-related deaths (%)	0 (0)	1 (0.5)	*
Stage I	Number of patients	52	59	
	Number of local Recurrences (%)	3 (5.8)	0 (0)	1
	Number of Metastases (%)	6 (11.5)	2 (3.4)	0.6697
	Number of Melanoma-related deaths (%)	1 (1.9)	1 (1.7)	0.536
Stage II	Number of patients	21	8	
	Number of local Recurrences (%)	2 (9.5)	0 (0)	1
	Number of Metastases (%)	8 (38.1)	1 (12.5)	0.4
	Number of Melanoma-related deaths (%)	5 (23.8)	0 (0)	1
Stage III	Number of patients	15	2	
	Number of local Recurrences (%)	1 (6.7)	0 (0)	1
	Number of Metastases (%)	4 (26.7)	0 (0)	1
	Number of Melanoma-related deaths (%)	4 (26.7)	0 (0)	1
Stage IV	Number of patients	1	2	
	Number of local Recurrences (%)	0 (0)	0 (0)	*
	Number of Metastases (%)	1 (100)	0 (0)	*
	Number of Melanoma-related deaths (%)	1 (100)	0 (0)	*
Stage 0 + I	Number of patients	60	279	
	Number of local Recurrences (%)	4 (6.7)	3 (1.1)	0.0327
	Number of Metastases (%)	6 (10.0)	3 (1.1)	0.0052
	Number of Melanoma-related deaths (%)	1 (1.7)	2 (0.7)	0.5778
Stage II- IV	Number of patients	37	12	
	Number of local Recurrences (%)	3 (8.1)	0 (0)	1
	Number of Metastases (%)	13 (35.1)	1 (8.3)	1
	Number of Melanoma-related deaths (%)	10 (27.0)	0 (0)	1

*Insufficient data to calculate p-value

006

TITLE: The Utility of Single-Stage Interpolation Flaps for Soft Tissue Reconstruction of the Head and Neck

AUTHORS: *S. Tyler Hollmig, MD[1]; Brian C. Leach, MD[1]; Joel Cook, MD[1]*

INSTITUTION: 1. Medical University of South Carolina, Department of Dermatology, Charleston, SC, United States

PURPOSE: Deep surgical wounds, particularly those encroaching upon free margins, may present advanced challenges to the reconstructive dermatologic surgeon. When these defects are simply covered with a graft or flap without provision of an adequate volume of underlying tissue, the resultant topographic disruption is not only cosmetically displeasing but also likely to desecrate the adjacent free margin and thereby induce a disturbance of function. Alternatively, repair options that import adequate tissue bulk in the absence of sufficient vascular support are similarly likely to fail. When addressing a deep defect that is not amenable to a local flap, a staged interpolation flap may offer contour restoration, flap viability, and an end surgical outcome surpassing that provided by other repair options. Unfortunately, however, many patients are unable to tolerate a staged procedure. In these settings, we have come to rely upon relatively novel and creative techniques of deepithelializing, transposing, and tunneling interpolation flaps in order to secure many of the advantages of a staged procedure while preserving the convenience and reduced morbidity of a single-stage repair. We describe multiple variations of single-stage interpolation flaps as robust and versatile options for reconstructing deep soft tissue deficits defects of the head and neck (Figures 1-3). Principles of appropriate patient selection, flap design, execution, along with potential pitfalls of single-stage interpolation flaps are discussed in detail.

DESIGN: We present a series of patients with deep wounds located adjacent to free margins following Mohs surgery repaired with single-stage interpolation flaps. With thoughtful design, these flaps may be mobilized and manipulated in a variety of manners that allow the essential principles of soft tissue reconstruction to be upheld during the reconstruction of relatively common yet difficult defects. The inherently robust vascularity of single-stage interpolation flaps is critical to their versatility in addressing wounds that are not only deep but also topographically complicated. An adequate volume of tissue may be imported without concern for excessive metabolic stress, and aggressive contouring may be performed when necessary to restore an intricate native topography. For particularly challenging wounds, we have found utility in deepithelializing a portion of the terminal flap in order to allow service as viable foundation for further surgical constructs. Care must be taken to avoid an excessively bulky pedicle as well as trapdooring, as these common complications of single-stage interpolation flaps can typically be avoided with proper design and execution.

CONCLUSION: Single-stage interpolation flaps allow reconstruction of difficult soft tissue defects after Mohs surgery. With thoughtful design, these flaps yield reproducibly excellent results with the convenience and reduced morbidity of a single-stage procedure.

Figure 1.

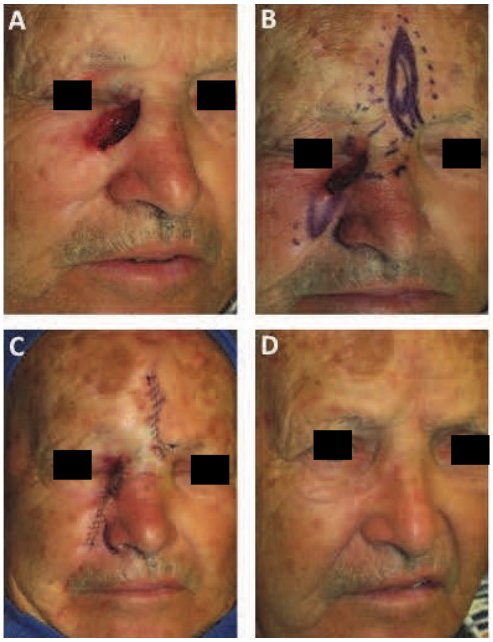


Figure 2.

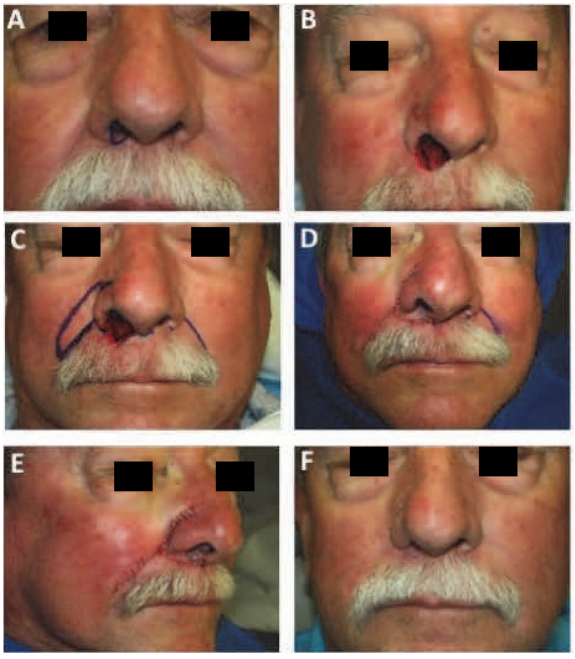
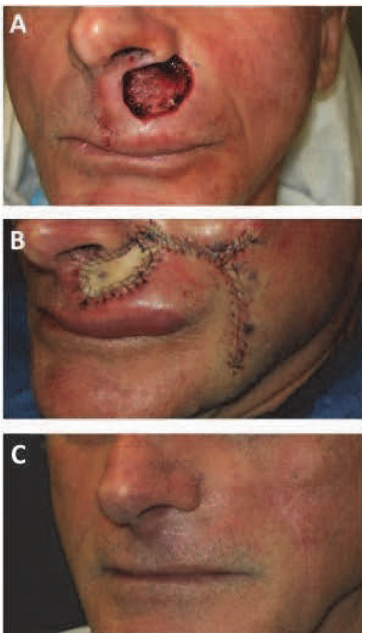


Figure 3.



007

TITLE: **Modified C-V Flap for Complete Nipple Loss Following Mohs Surgery**

AUTHOR: *Joseph F. Sobanko, MD*[1]

INSTITUTION: 1. University of Pennsylvania, Philadelphia, PA, United States

PURPOSE: Successful breast reconstruction following cancer resection is known to improve patient quality of life (Eltahir et al Plast Reconstr Surg 132:201e, 2013). The purpose of this pearl is to present a local flap that restores symmetry and projection after complete loss of the nipple.

DESIGN: A 47-year-old female presented with biopsy-proven Bowen's disease of the right nipple (CEA/CK7 negative, AE1/AE3 positive) (Figure 1). MRI and mammogram revealed no suspicion for malignancy. The tumor was removed with Mohs micrographic surgery, resulting in complete nipple loss (Figure 2A). The defect was reconstructed as follows: With the patient sitting upright, two rectangular limbs are designed horizontally, arising immediately from the defect. In order to compensate for subsequent collapse, the vertical height of the horizontal limbs should be 1.5-2 times larger than the height of normal nipple. The length of horizontal limbs should reach the extent of their respective areolar margin. Finally, the width of pedicle (designed off of the cephalic areolar margin) should equal the width of normal nipple (Figure 2B). Next, an incision is made through the horizontal limbs to the subcutaneous layer (Figure 2C) and the distal aspect of one of the horizontal limbs is de-epithelialized (the shaded area on Fig. 2b and shown de-epithelialized in Fig. 2c). The flap is undermined at the subcutaneous layer to the cephalic margin of areolar complex (Figure 2D). The epithelialized horizontal limb is then curled toward the

pedicle and sutured to the contralateral margin of the pedicle (Figure 2E). The de-epithelialized horizontal limb is rotated 90-degrees in the air and the de-epithelialized portion is turned into the pocket created by the other horizontal limb (Figure 2F). Finally, the secondary defect is sutured closed and redundant cones are removed as necessary (Figure 2G). Figures 2H and 3 demonstrate the immediate and 3-month postoperative appearances, respectively.

CONCLUSION: The C-V flap and its numerous published modifications provide a reliable, single-stage reconstruction for complete nipple loss by creating a folded flap, supported by connective tissue, which restores nipple symmetry and projection.

Figure 1.

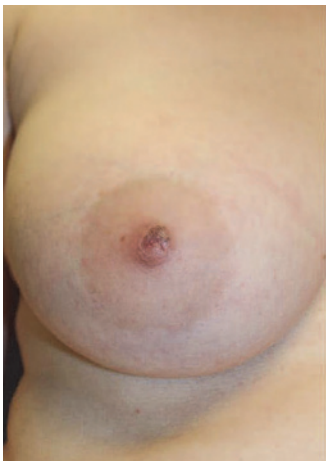


Figure 2.

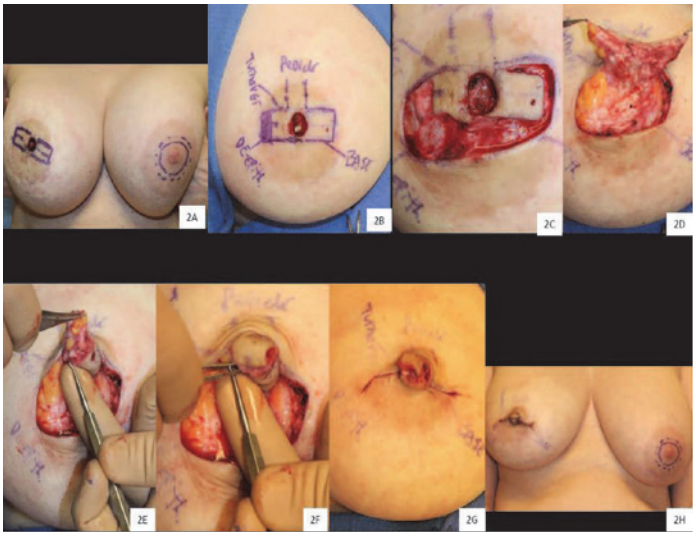
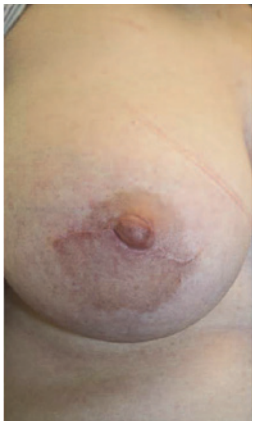


Figure 3.



008

TITLE: Work Habits and Safety Issues among Mohs Histotechnicians: A Survey of Mohs Histotechnicians in 2013

AUTHORS: *Nicole F. Velez, MD[1]; Kachiu C. Lee, MD, MPH[3]; Alyssa B. Findley, MD[1]; Susan Sweeney, MD[1,2]; Nathaniel J. Jellinek[1,3]*

INSTITUTIONS: 1. Dermatology Professionals, Inc., East Greenwich, RI, United States 2. University of Massachusetts Medical School, Division of Dermatology, Worcester, MA, United States 3. Brown University, Department of Dermatology, Providence, RI, United States

PURPOSE: To describe work practices and safety issues among Mohs histotechnicians and to better understand the incidence of musculoskeletal, cold and sharps injuries in this population.

SUMMARY: 103 Mohs histotechnicians completed the survey (Table 1). 83% were women. Mean age was 43±11 years and 64% of respondents had worked as a Mohs histotechnician for more than 5 years. Mean number of days of work was 4 per week and average number of slides prepared per day was 38±20. Musculoskeletal discomfort was most common in the neck (57%), shoulders (63%), and lower back (56%) (Figure 1). The majority (86%) had not required time off from work due to musculoskeletal concerns. Those who required time off from work were more likely to use over the counter pain medications routinely ($p<.01$). 52% had incorporated ergonomic equipment in the workplace (Table 2). 60% reported a history of sharps injury with the cryostat. Only 43% of these patients underwent blood borne pathogen testing. Age, years of experience, days of work per week, number of slides per day and history of grossing tissue did not correlate with risk of sharps injury. Sharps injuries were more common in people who reported feeling exhausted at the end of the day ($p<0.01$) and those who did not exercise regularly ($p<.001$). The cold temperature of the cryostat caused discomfort, numbness and/or bone pain in 45% on a weekly or daily basis. More frequent cold injury was associated with colder cryostat temperatures ($p<0.01$) and with an attitude of worsening discomfort at work ($p<0.01$).

68% of respondents were unsure if safety issues were addressed adequately by the American Society of Mohs Histotechnology.

DESIGN: A survey study was sent to members of the American College of Mohs Surgery in 2013 for them to forward to their lab histotechnicians. The main outcome measures were demographics of histotechnicians, work style practices, musculoskeletal symptoms, cold injuries and sharps injuries. Data analysis was completed using χ2 and univariate and multivariate regressions on Stata (StataCorp, College Station, TX).

CONCLUSION: Dermatologic surgeons depend on the high quality work of their Mohs histotechnicians, and understanding their work habits and concerns is critical to ensuring a healthy work environment. Whereas the majority of Mohs histotechnicians did not seem to be limited by musculoskeletal discomfort, there is a high prevalence of sharps and cold injuries in this population. Further study and understanding of the nature of these injuries may help us develop practices to prevent these events.

Table 1. Characteristics/Outcome of Mohs Histotechnicians

Characteristics/outcomes	N = standard deviation
Total subjects	103
Women: Men	86:17
Mean age (years)	43±11
• Women (years) • Men (years)	43±11 42±11
Five or more years as a Mohs histotechnician	66
Participation in regular exercise	55
Mean # of days of histotechnician work/week	4±1
Mean # of hours of histotechnician work/week	28±11
Mean # of slides cut per day	38±20
Responsible for grossing tissue	64
History of cryostat injury	61
Discomfort from cold temperature of cryostat	
• Daily or weekly • Monthly • Rarely • Never	46 10 31 16

Figure 1. Distribution of Musculoskeletal Pain by Gender in Mohs Histotechnicians

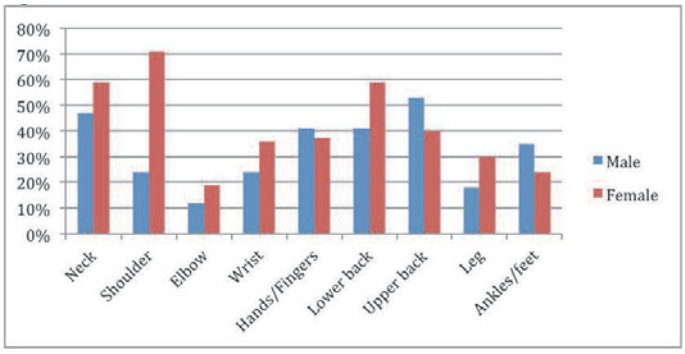


Table 2. Ergonomic Practices Incorporated by Mohs Histotechnicians

Ergonomic Practice	N
Gel foot/Anti-fatigue pads	20
Supportive chairs	17
Orthotics/gel inserts for shoes	4
Adjustable stool/chair	3
Other	4

009

TITLE: Risk of Primary Cutaneous Malignancies Following Diagnosis of Merkel Cell Carcinoma: A Population-Based Study

AUTHORS: *Michael B. Chang, MD[1]; Amy Weaver, Statistician[1]; Jerry D. Brewer, MD[1]*

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PURPOSE: As management of Merkel Cell Carcinoma (MCC) improves, understanding the risk of subsequent primary cutaneous malignancies (PCM) can improve dermatologic follow-up and consequent patient mortality. We sought to determine the incidence of second PCM following a diagnosis of MCC.

SUMMARY: A total of 2863 (1703 males and 1160 females) MCC cases met the study criteria. The age-adjusted incidence was significantly higher in males (0.68 per 100,000; 95% CI 0.64-0.71) than in females (0.31 per 100,000; 95% CI 0.29-0.33) and increased over the study period (Figure 1). Among the 2863 patients, 2824 had at least 1 month of follow-up after their primary MCC diagnosis of which, 35 had a second histologically confirmed, malignant, primary MCC. The cumulative incidence of having a second primary MCC diagnosis by 5- and 10-years after the first MCC diagnosis was 2.1% and 3.3% for males and 1.1% and 2.5% for females, respectively. One case each of Kaposi sarcoma, malignant fibrous histiocytoma, and sebaceous carcinoma after the MCC diagnosis were identified. Among the 1133 females with MCC and no prior MM, 3 subsequently developed MM and the overall incidence of MM was 60.7 per 100,000 person-years (95% CI 12.6-177.2), which was not significantly higher than expected in the general population (SIR 1.7, 95% CI 0.3-4.9). Among the 1642 males with MCC and no prior MM, 20 subsequently developed MM and the overall incidence of MM was 313.5 per 100,000 person-years (95% CI 191.4-484.2), which was significantly higher than expected in the general population (SIR 3.6, 95% CI 2.2-5.6).

DESIGN: All patients with their first diagnosis of histologically confirmed, malignant, primary MCC of the skin between 1992 and 2009 were identified using the 13 program registries of the Surveillance, Epidemiology, and End Results (SEER) Program. Age-adjusted MCC incidence rates per 100,000 person-years were calculated using the 2000 US standard population. Patients were monitored for vital status and histologically confirmed PCM through December 2010. Standardized incidence ratios (SIRs) were constructed through comparison of the observed number

of malignant melanoma (MM) cases with the expected number in the general US population.

CONCLUSION: The age-adjusted incidence of MCC was significantly higher among males compared to females. Incidence data reported herein for MCC is consistent with published data, trending upward from 1992 to 2009. Among males with MCC, risk of MM is significantly increased compared to the general population. As treatments including Mohs surgery and radiation lengthen and improve post-diagnosis quality-of-life, closer and more focused monitoring of this particular population may more efficiently utilize diminishing resources. Future studies should examine the risk of subsequent more common non-melanoma type skin cancers, which are not included in the SEER registries.

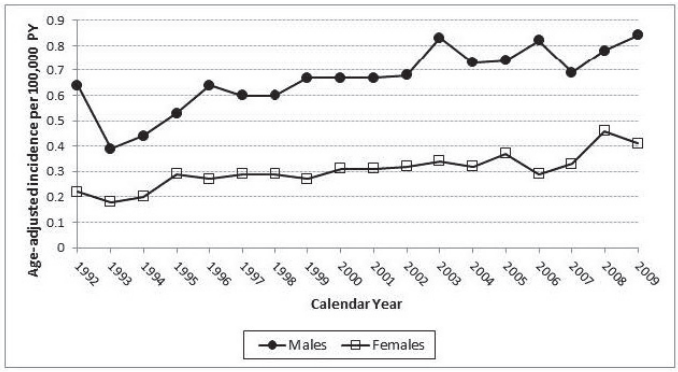

Figure 1. Age-adjusted incidence of MCC per 1,000,000 person years according to sex and calendar year of diagnosis.

010

TITLE: Familiarity of Mohs Micrographic Surgery among Family Physicians

AUTHORS: *Abdel Kader El Tal, MD[1]; Katherine L. Caretti, MD[1]; David A. Mehregan, MD[1]*

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PURPOSE: The main objective of this study was to evaluate via a short questionnaire the familiarity of Family Physicians with the Mohs micrographic surgery technique as well as the indications for this procedure. The secondary objective was to assess for the pattern of referrals done by these physicians, once faced with the diagnosis of non-melanoma skin cancers.

SUMMARY: Most family physicians (91%) have learned about Mohs surgery and its indications during residency. More than 90% of Physicians are aware that the Mohs technique achieves the highest cure rate among all other procedures. The majority of Family Physicians (65%) diagnosed non-melanoma skin cancers in their office via biopsy or excision but only a few treat these tumors in their office (14%). The majority of these cancers are sent to Dermatologists (39%) or Mohs Surgeons (34%) for further treatment.

DESIGN: A survey questionnaire, consisting of 10 questions, was sent via Survey Money to 300 Family Physicians with 79 replies obtained.

CONCLUSION: The vast majority of Family Physicians are aware of the Mohs technique, its indications, and its high cure rate of NMSC. Most of non-melanoma skin cancers diagnosed at the Family Physician's are referred to Dermatologists or Dermatologic Surgeons for further treatment.

011

TITLE: A Comparison of Same-day Pre-operative Evaluation to Different-day Pre-operative evaluation for Mohs Micrographic Surgery: Outcomes and Complication Rates

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PURPOSE: Many patients that undergo Mohs surgery are referred from outside physicians. A pre-operative evaluation is frequently performed to assess the patient and counsel them on the procedure. However, in the era of escalating health costs, there is increasing pressure to consolidate and streamline the delivery of health care. While many surgeons prefer to utilize a preoperative evaluation, there is no current evidence to suggest that such an evaluation improves care. The goal of this study is to compare and evaluate outcomes, complications, and factors that could delay surgery between two cohorts of patients: 1) those with a same-day pre-operative evaluation, and 2) those with a separate day pre-operative evaluation from their day of Mohs surgery.

SUMMARY: Two-hundred and thirty-three patients were evaluated. Of these, 63 (27.04%) underwent pre-operative evaluation on the same day as their Mohs surgery, and 170 (72.96%) underwent pre-operative evaluation on a day different from their Mohs surgery. These two groups did not differ between age (p=0.68), or sex (p=0.82). We found no significant difference between the groups in the rate of surgical complications (p=0.53), or in the need to delay surgery due to a requirement for prophylactic antibiotics, or a cardiology consult (p=0.29). Additionally, there was no difference in the unexpected need for an adjuvant surgical service (0% in both groups). We also found no significant difference in the number of patients requiring an anxiolytic (p=0.20).

DESIGN: A retrospective single-institution cohort study was performed by evaluating the medical records of patients undergoing Mohs surgery the first day of each week from December 2011 to December 2013. Patients were included if they were referred from an outside institution and underwent pre-operative evaluation either on the same-day, or on a different-day as their Mohs surgery. Patients were excluded if the Mohs surgeon did not perform the surgical repair. Patient demographics, use of anticoagulants, need for prophylactic antibiotics, need for anxiolytics, complications after surgery (bleeding,

hematoma, need for antibiotics post operatively, flap necrosis), and factors that led to a delay in surgery (administration of prophylactic antibiotics, unexpected need for an adjuvant surgical service) were evaluated and recorded. We used two-sample t-tests to assess the statistical significance of the type of pre-operative evaluation on the rate of complications or delays in surgery.

CONCLUSION: Our study shows no difference in patient outcomes whether the pre-operative evaluation was performed on the same day or a different day of Mohs surgery. Our patients did not require unexpected adjuvant surgical intervention and did not demonstrate an increased need for anxiolytics. We conclude that same-day pre-operative evaluation can help reduce the overall impact of healthcare costs to the patient by reducing the number of patient visits without impacting patient outcomes.

012

TITLE: Comorbidity Assessment in Skin Cancer Patients: A Pilot Study Comparing Medical Interview with a Patient Reported Questionnaire

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INSTITUTIONS: 1. Memorial Sloan Kettering Cancer Center, Department of Dermatology, New York, NY, United States 2. Memorial Sloan Kettering Cancer Center, Department of Radiation Oncology, New York, NY, United States

PURPOSE: Comorbidities have shown to predict outcomes in a wide range of conditions and may be valuable in the assessment of skin cancer patients. However, there are no validated tools for comorbidity assessment in this population, and most dermatologists rely on standard history taking to obtain these data. In the general cancer population, the Adult Comorbidity Evaluation-27 (ACE-27) is a validated instrument used to identify and grade comorbidities. In this pilot study, we compared comorbidity assessments collected by traditional medical interview (MI) in a dermatologic surgery practice and by standardized patient-reported questionnaire based on the ACE-27 (PRACE-27) ascertained by a radiation oncologist.

SUMMARY: Forty-four patients (50% women) were evaluated for twenty-seven comorbidities. Median patient age was 76 years (range 25-94 years). Percent agreement and kappa scores for comorbidity identification in individual organ systems between the MI and PRACE-27 was very high (96%, range: 77.3-100%, kappa=0.81). Prevalence of individual organ system comorbidities identified by MI was 9.9% and by PRACE-27 was 12.5%. When there were discordant observations, PRACE-27 was more likely than MI to identify the comorbidity (OR=5.4, 95% CI=2.4-14.4, p<0.001). While there were discrepancies in the comorbidity grading severity of individual organ systems, the discrepancy in the overall comorbidity score for the patients was minimal. The PRACE-27 identified 4 patients (9%) with a comorbidity that the MI did not, compared to 1 patient (2%) identified by the MI that was missed by the PRACE-27 (p=0.38). PRACE-27 did tend to identify a greater severity of comorbidity when both assessments agreed to its presence. PRACE-27 rated 8 patients with a higher severity than the MI, whereas MI did not up-classify any patients compared to PRACE-27.

DESIGN: Skin cancer patients evaluated by both a radiation oncologist and one of two Mohs surgeons at a single cancer center within six months of each other between September 2011 and October 2013 were studied. The Mohs surgeons ascertain comorbidities through a traditional MI, while the radiation oncologist prospectively administers a patient reported questionnaire based on the ACE-27 (PRACE-27). Medical comorbidities were identified and graded according to the ACE-27 using information compiled from the MI in the dermatologic surgery consultation note. ACE-27 organ system and overall comorbidity scores were then compared for agreement using kappa statistics and odds ratios.

CONCLUSION: Based on this pilot study, a standardized patient reported questionnaire may better identify and grade comorbidities in skin cancer patients compared to standard medical history taking. It is yet to be determined whether a standardized health questionnaire that better captures comorbidities will play a role in determining patients' optimal skin cancer management. However, it is likely that comorbidity assessment will be recognized as an important factor in individualizing treatment, especially with the aging population and evolving medical landscape.

013

TITLE: Histologic Findings on Mohs Frozen Sections: Granulomatous Inflammation in a Patient undergoing BRAF/MEK Inhibition Therapy

AUTHORS: *David L. Chen, MD[1]; Rene Gonzalez, MD[2]; Joshua Wisell, MD[3]; Mariah R. Brown, MD[3]*

INSTITUTIONS: 1. University of Colorado Health Center, Department of Dermatology, Aurora, CO, United States 2. University of Colorado Health Center, Department of Cutaneous Oncology, Aurora, CO, United States 3. University of Colorado Health Center, Aurora, CO, United States

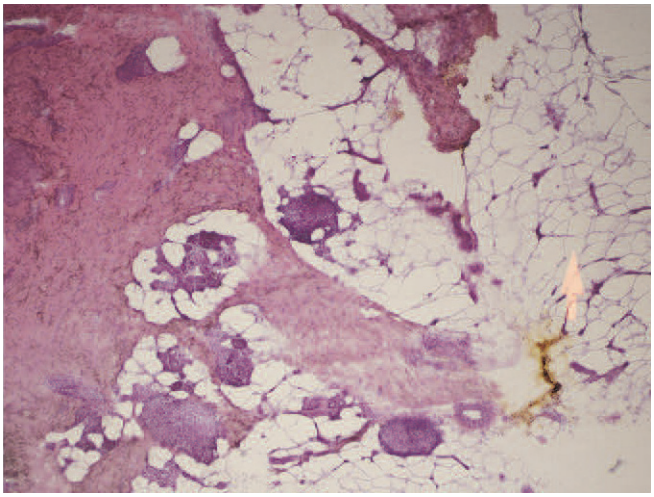
SUMMARY: We report a case of BCCs associated with granulomatous panniculitis on Mohs sections in a patient undergoing combination BRAF/MEK inhibition therapy. These histologic findings were most consistent with cutaneous sarcoidosis, especially in the context of the patient's newly diagnosed pulmonary sarcoid. The patient had no other skin findings consistent with sarcoidosis other than the granulomatous inflammation seen beneath her BCCs on Mohs frozen sections.

DESIGN: A 53 year-old woman on BRAF/MEK inhibition therapy for two years for metastatic melanoma presented for treatment of BCCs on lower extremities. Initial curettage extended to fat, and the procedures were converted to MMS. No residual BCC was seen in the planes of the Mohs frozen sections. However, dense collections of inflammatory cells were seen in the fat lobules near the dermal-subcutis junction. To ensure that the inflammation was not masking tumor, Mohs blocks were submitted for

permanent sections. On paraffin embedded blocks, no BCC or metastatic melanoma was seen within the areas of inflammation in the subcutis, and the inflammatory collections were found to be sarcoidal granulomas. The patient had no other concerning inflammatory or malignant skin lesions on full skin exam. At the same time, pulmonary nodules that had gradually developed over the course of the patient's BRAF/MEK inhibitor therapy were noted to have enlarged and become more avid on PET-CT. These lesions were biopsied and revealed non-caseating granulomas consistent with pulmonary sarcoidosis. This new onset sarcoidosis was felt to be related to BRAF/MEK inhibition study drugs.

CONCLUSION: Cutaneous sarcoidal granulomas, found in conjunction with or without cutaneous neoplasms, appear to be a side effect of BRAF/MEK inhibition. When this type of inflammation is seen on frozen sections, Mohs surgeons can be reassured that this histologic finding represents a medication side effect rather than tumor response.

Figure 1. Dense inflammatory infiltrates noted in the subcutaneous tissue underlying a BCC



014

TITLE: Increased Mortality in Transplant Recipients with a History of Pretransplant Melanoma

AUTHORS: *Sarah T. Arron, MD, PhD[1]; Elizabeth Yanik, PhD [2]; Amanda Raymond, MD[1]; Charles McCulloch, PhD[3]; Eric Engels, MD[2]*

INSTITUTIONS: 1. University of California, San Francisco, Department of Dermatology, San Francisco, CA, United States 2. NIH/NCI, Bethesda, MD, United States 3. University of California, San Francisco, Department of Epidemiology and Biostatistics, San Francisco, CA, United States

PURPOSE: Current recommendations for transplant in patients with a history of melanoma are based on limited data. Our aim was to determine the impact of pretransplant melanoma on outcomes of melanoma-specific death, all-cause mortality, and incident primary melanoma after transplant. We studied these outcomes in adult US transplant recipients in the Transplant Cancer Match Study.

SUMMARY: 336 of 191,471 subjects had pretransplant melanoma (0.18%). Recipients with pretransplant melanoma had 27-fold increased hazard for melanoma-specific death after transplant (95% CI 11.2-65.2) and a 1.26-fold increased hazard for death from any cause (95% CI 1.04-1.5). Recipients with pretransplant melanoma had a 5.38-fold increased hazard of incident melanoma after transplant (95% CI 2.9-9.8). Despite these increased hazards, melanoma-related events were rare. The 5- and 10-year cumulative incidence of melanoma-specific death was 0.29% and 0.74% in subjects with pretransplant melanoma compared to 0.01% and 0.03% in subjects without pretransplant melanoma, an absolute risk difference of 0.28% at 5 years and 0.71% at 10 years. Similarly, the 5- and 10-year cumulative incidence of incident primary melanoma was 0.75% and 1.36% in subjects with pretransplant melanoma compared to 0.14% and 0.26% in subjects without pretransplant melanoma, an absolute risk difference of 0.61% at 5 years and 1.11% at 10 years. In contrast, the 5- and 10-year cumulative all-cause mortality was 33.6% and 59.6% in subjects with pretransplant melanoma, compared to 20.4% and 38.0% in subjects without pretransplant melanoma, an absolute risk difference of 13.2% and 21.6%. This difference may be attributable to melanoma deaths that were misclassified in registry data or to the possibility that subjects being transplanted despite pretransplant melanoma may have had underlying disease acuity contributing to their need for transplant and subsequent risk of death.

DESIGN: Cox regression models were constructed to assess the effect of pretransplant melanoma adjusted for age at transplant, sex, race, year of transplant, and abdominal vs. thoracic transplant. Competing risks regression methods were used for the outcomes of melanoma-specific death and incident melanoma.

CONCLUSION: The potential for increased mortality in transplant recipients with a history of pretransplant melanoma may have clinical relevance in determining whether and when candidates should be listed for transplant. In addition, the increased risk of incident melanoma in transplant recipients with pretransplant melanoma suggests that careful melanoma screening should be recommended for these patients.

015

TITLE: Hyaluronic acid filler--Not to be Confused with Mucin from Basal Cell Carcinoma: 16 Mohs surgery cases (2003-2013)

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INSTITUTIONS: 1. Bennett Surgical Center, Santa Monica, CA, United States 2. University of Southern California, Division of Plastic Surgery, Los Angeles, CA, United States

PURPOSE: Injectable fillers are now one of the most commonly performed procedures in the United States. Studies suggest that hyaluronic acid (HA) lasts six months to

two years after implantation based on clinical observation (De Boulle et al 2013). In a prior publication, HA had been histopathologically shown in a Mohs surgery patient to have persisted three years after implantation (Bennett et al 2005) (Figure 1). We aimed to expand this observation into a retrospective review of all Mohs surgery patients in whom hyaluronic acid was demonstrated histopathologically with toluidine blue or hematoxylin and eosin (H&E) staining.

SUMMARY: There were 16 patients where HA filler was found during Mohs surgery from 2003-2013. All patient lesions were basal cell carcinoma (BCC). The average patient age was 62.5 years and 12/16 patients were women. There was a site predilection for lips (66.7%). There were no major surgical complications after Mohs surgery and flaps were the most common repair with excellent cosmetic results. Although some of the BCCs had significant amounts of mucin, HA was easily distinguished from the tumor (Figure 2). The average duration of HA shown with Toluidine blue after implantation was 2.6 years (Figure 3).

DESIGN: A retrospective review of cases was performed by reviewing patient charts, tissue slides, and photomicrograph databases. Clinical characteristics and surgical outcome data were analyzed. Toluidine blue staining at pH 7.07 was performed on fresh tissue obtained from patients during Mohs surgery to highlight acid mucopolysaccharides secreted by BCC. Toluidine blue staining also highlights HA filler better than H&E (Figure 2).

CONCLUSION: This is the largest retrospective review of HA filler found during Mohs surgery to date. We show HA persists histopathologically longer in tissue than previously suggested with no major effect on the efficacy of Mohs surgery. Although in most cases HA filler was an incidental finding during Mohs surgery, in at least 1 case the filler was used to correct a surface deformity caused by a sclerosing BCC on the nose.

Figure 1. Index Case. 81 year-old woman with history of hyaluronic acid injection to the nasal tip for cosmetic correction of contour deformity. After Mohs surgery, histopathologic findings demonstrate presence of basal cell carcinoma without evidence of mucin production by the BCC. Hyaluronic acid persisted in this patient for 3 years.

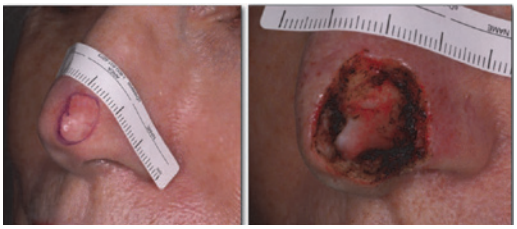


Figure 2. A. Toluidene blue (TB) meta-chromatically stains hyaluronic acid (HA) red. B. HA stained with hematoxylin and eosin (H&E). Compared to TB, HA is not as apparent with H&E. C. TB highlights a mucin-producing basal cell carcinoma adjacent to HA filler injected 3 years prior to Mohs surgery.

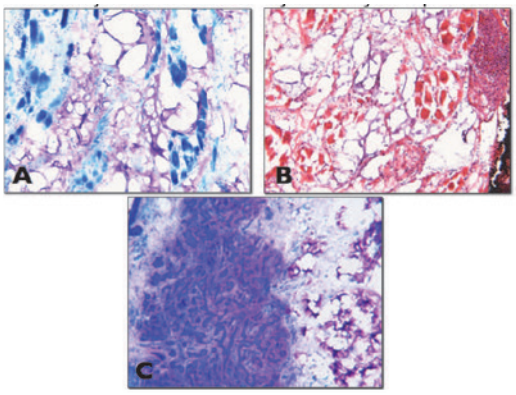
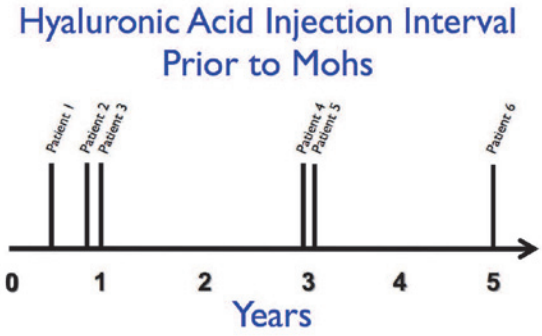


Figure 3. The duration after injection in tissue of hyaluronic acid filler in 6 patients demonstrated with Toluidene blue ranged from 6 months to 5 years.



016

TITLE: Utility of Wood's Light in Margin Determination of Melanoma In-situ

AUTHORS: *Stephanie B. Walsh, MD[1]; Rajat Varma, MD[2]; David W. Raimer, MD[3]; James C. Keane, MD[4]; Alan Cantor, PhD[5]; Conway C. Huang, MD[1]*

INSTITUTIONS: 1. University of Alabama, Birmingham, Department of Dermatology, Birmingham, AL, United States 2. University of North Carolina, Department of Dermatology, Chapel Hill, NC, United States 3. Private Practice, Galveston, TX, United States 4. Private Practice, Shreveport, LA, United States 5. University of Alabama, Birmingham, Division of Preventive Medicine, Birmingham, AL, United States

PURPOSE: Margin evaluation of suspected malignant melanoma in situ (MMIS) is difficult due to its often ill-defined borders. Although not recognized as standard of care, Wood's light exam has been used by many to help delineate MMIS margin before excisional biopsy or excision by highlighting what is presumed to be epidermal melanocytic proliferation that may not be visible under

normal light. Unfortunately, the true value of preoperative Wood's light exam for margin assessment of MMIS is not known with certainty due to lack of prospective and systematic analysis. To address this, we designed a trial to study the accuracy of preoperative Wood's light exam for margin assessment of MMIS.

SUMMARY: Seven of 60 tumors (11.7%) had Wood's light enhancement beyond the visible light margin of the biopsy site. In all 7 of the enhancing cases, increased wounding would have occurred had the surgical margins been based on Wood's light exam. In 6 of the 7 enhancing cases, use of the surgical margins defined by Wood's light exam would not have changed the number of surgical stages needed to clear the tumor. In 1 of the 7 enhancing cases, use of the surgical margin demarcated by the Wood's light exam would have reduced the surgical stages needed by 1 stage but would have increased the wound size by 83.3% as enhancement in this case was greater than 0.5cm from the clinical margin.

DESIGN: We evaluated 60 consecutive patients who presented for excision of MMIS. All patients had prior excisional biopsy and no remaining lesion under white light. The visible tumor margin under white light exam was recorded and compared to the tumor margin under Wood's light exam. All patients went on to have standard slow Mohs using rush permanent sections with 0.5cm margins based on the standard white light exam. After patients achieved clear margins and the true histologic extent of their MMIS was known, we compared their actual final wound size with the wound size they would have had if margins had been based on Wood's light exam. In other words, we prospectively evaluated if preoperative assessment with the Wood's light could more accurately predict a clear margin than standard white light.

CONCLUSION: We conclude that Wood's light exam for delineating MMIS borders preoperatively has limited utility if current guidelines recommending complete excisional biopsy of MMIS are followed prior to initiating treatment. As long as all suspected MMIS visible under standard white light was biopsied, Wood's light exam did not reliably enhance any further subclinical lesion. In this study, surgical margin based on the Wood's light exam would have resulted in an increased average wound size and would not have reliably reduced the number of stages needed to clear the tumor when performing slow Mohs.

Figure 1A. Tracing of visible tumor margin (inner solid line) and corresponding 0.5cm surgical margin (outer solid line). Tracing of tumor margin demarcated by Wood's light exam (inner dotted line) and corresponding 0.5cm surgical margin (outer dotted line).
Figure 1B. Tracing of final wound size once clear margins achieved histologically.
Note: in this case use of the Wood's light exam would have reduced the surgical stages needed by 1 stage, but would have increased the final wound size by 83.3%.

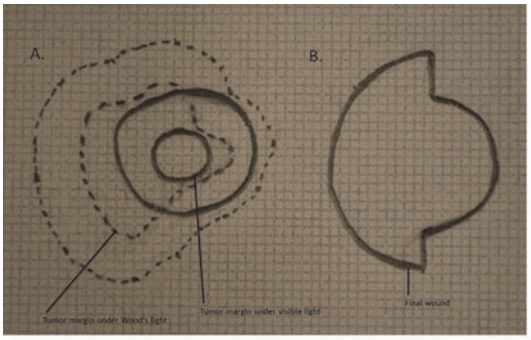


Figure 2A. Tracing of visible tumor margin (inner solid line) and corresponding 0.5cm surgical margin (outer solid line). Tracing of tumor margin demarcated by Wood's light exam (inner dotted line) and corresponding 0.5cm surgical margin (outer dotted line).
Figure 2B. Tracing of final wound size once clear margins achieved histologically.
Note: In this case use of the Wood's light exam would have increased the final wound size by 176.5% and would not have reduced the surgical stages needed to clear the tumor.

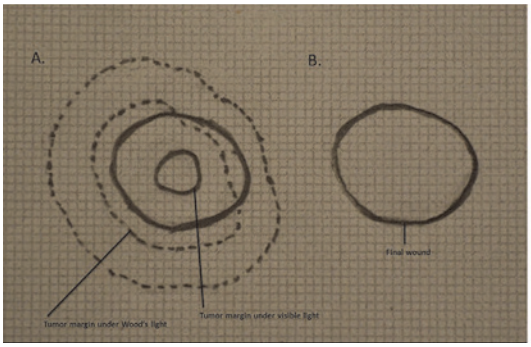
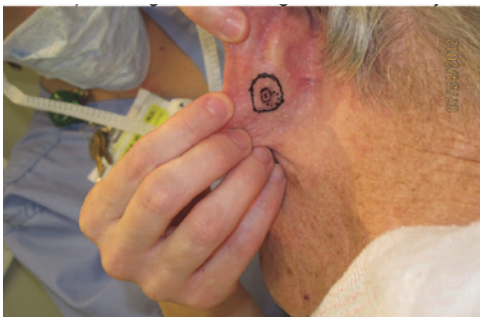


Figure 3. Clinical tracing of visible tumor margin (inner solid line) and corresponding 0.5cm surgical margin (outer solid line). Tracing of tumor margin demarcated by Wood's light exam (dotted line).



017

TITLE: Optical Coherence Tomography: Clinical Applications in Diagnosis of Non-melanoma Skin Cancers

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PURPOSE: Non-invasive imaging technologies for diagnosis of non-melanoma skin cancers have recently begun to gain popularity with the advent of non-surgical treatment modalities such as topical immunomodulators and photodynamic therapy. Additionally, diagnostic imaging may allow for avoidance of biopsies and more timely surgical management. Optical coherence tomography (OCT) is a relatively new in vivo digital imaging modality to assess skin lesions in a clinical setting. OCT utilizes infrared light to provide high-resolution two-dimensional vertical images of tissue, with a depth of up to 1.5mm. There have been relatively few studies characterizing OCT findings for non-melanoma skin cancers.

SUMMARY: OCT appears to allow very sensitive and specific identification of non-melanoma skin cancers. We were able to arrive at several standard characteristics for non-melanoma skin cancers, especially basal cell carcinoma.

DESIGN: Our objective was to further characterize the OCT findings for non-melanoma skin cancers. Our lesions were clinically identified from patients who had come in for their regular dermatology visits at the Veterans Affairs New York Harbor Healthcare System Brooklyn. Lesions were identified clinically and included in our study. The lesions were photographed both clinically and dermatoscopically, and then OCT was performed on the lesion. The lesion was then biopsied. The OCT characteristics were then compared with clinical, dermatoscopic, and histological findings.

CONCLUSION: Here, we present the OCT Atlas group's ongoing work at the Veterans Affairs New York Harbor Healthcare System to characterize the OCT findings of non-melanoma skin cancers, its correlation with dermatoscopy and histopathology, and its clinical applications for the future.

018

TITLE: A Comparison of Super Wide Field Microscopy Systems in Mohs Surgery

AUTHORS: *Anne J. Goldsberry, MD, MBA[1]; C. William Hanke, MD, MPH[1]; Nicholas B. Countryman, MD, MBA[1]*

INSTITUTION: 1. Laser and Skin Surgery Center of Indiana, Carmel, IN, United States

PURPOSE: Microscopic frozen section interpretation is one of the cornerstones of Mohs surgery. The recent development of super wide field (SWF) microscopy has the potential to improve physician accuracy and efficiency while reading slides, and therefore, to decrease the physician's musculoskeletal and ocular strain. SWF microscopy systems combine lower magnification objectives (1x or 2x, Figure 1) with eyepieces that have a higher field number (FN) to increase viewable field area (VA). The FN refers to the diaphragm diameter of an eyepiece. Traditional wide field eyepieces have a FN of 18-22 mm. The newer SWF eyepieces have a FN of 25-26.5 mm. Despite the availability of SWF systems, many Mohs surgeons remain unaware of the advance in technology. This abstract reviews three SWF microscopy systems: Leica DM2000, Nikon Eclipse 80i, and Olympus Bx43.

SUMMARY: Viewable Field Area (VA) is calculated using two equations: Viewable Field Area= (∏ x View Field Diameter^2)/4 View Field Diameter= (Field Number)/ (Magnification Objective x Tube Lens Magnification Factor) Most systems have tube lens magnification factors equal to 1, which will be assumed in all of the calculations. The Leica DM 2000 Microscope has a FN of 25 and is available with 1.25x, 2.5x, 4x, and 10x objectives. The Nikon Eclipse 80i Microscope has a FN of 25 and is available with 1x, 2x, 4x, and 10x objectives. The Olympus Bx43 Microscope has a FN of 26.5 and is available with 1.25x, 2x, 4x, and 10x objectives. The Leica DM200's 1.25x objective results in a VA of 314.16 mm2. The Nikon Eclipse 80i's 1x objective results in a VA of 490.87 mm2. The Olympus Bx43's 1.25x objective results in a VA of 352.99 mm2. The maximum VA at the lowest objective for Nikon is nearly 40% greater than for the Olympus and over 50% greater than for the Leica. Table 1 shows the calculated VA for each objective. Note that with comparable magnification objective, the Leica and Nikon result in identical VA values because both systems share the same FN. In contrast, the Olympus shows higher VA than the Leica and Nikon systems at the same magnification objective because of its higher FN. Each microscope system is has its own proprietary software and digital platform (Figure 2). The resolution of each camera system is comparable. All of the systems capture a smaller area than the VA due to the placement of the camera and camera optics. This interferes with the ability to capture images of entire specimens, especially if large. The Leica system overcomes this limitation by "stitching" together adjacent images on the slide to make a composite image.

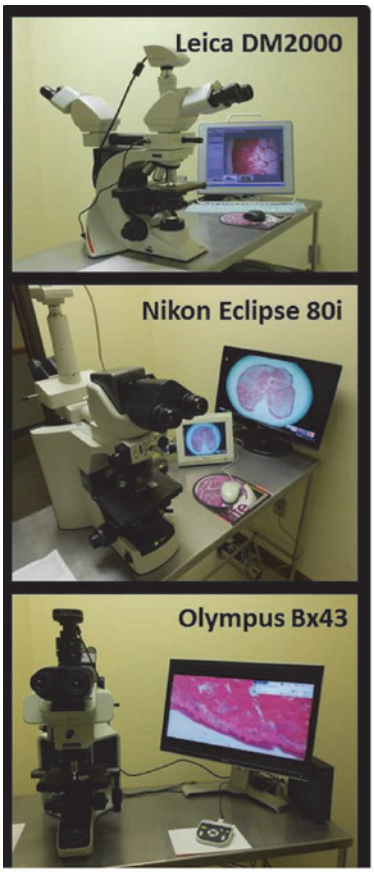
CONCLUSION: The Nikon Eclipse 80i has a significantly higher maximum viewable field area than the other two systems.

Table 1. Viewable field area for the magnification objectives in each of the microscope systems.

Ultrawide Field Eyepiece			
System	Magnification Objective	Field Number (mm)	Viewable Field Area (mm^2)
Leica DM2000	1.25	25	314.16
	2.5	25	78.54
	4	25	30.68
	10	25	4.91
Nikon Eclipse 80i	1	25	490.87
	2	25	122.72
	4	25	30.68
	10	25	4.91
Olympus Bx43	1.25	26.5	352.99
	2	26.5	137.89
	4	26.5	34.47
	10	26.5	5.52

Figure 1. Low magnification objectives for the Leica DM2000, Nikon Eclipse 80i and Olympus Bx43

Figure 2. The Leica DM2000, Nikon Eclipse 80i and Olympus Bx43 super wide field microscopy systems.



019

TITLE: Effect of Wait Times on Surgical Defect Size in Patients Undergoing Mohs Micrographic Surgery

AUTHORS: *Joseph Diel, MD[1]; Li-Jung Liang, PhD[2]; Teresa T. Soriano, MD[1]; Melvin Chiu, MD[1]*

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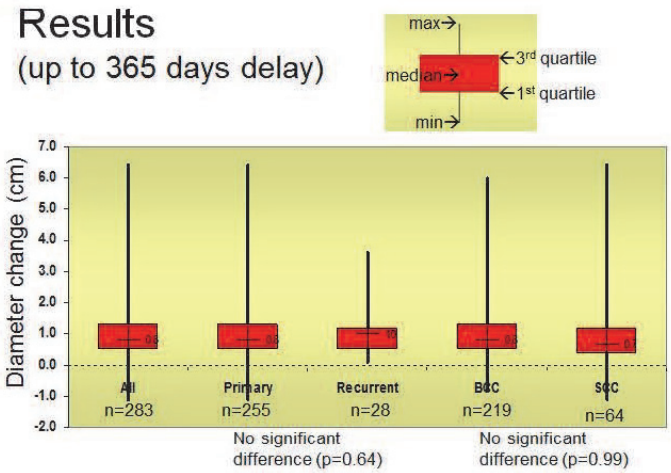
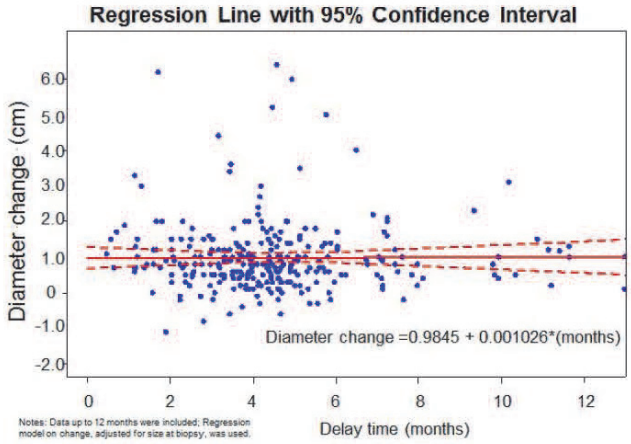
PURPOSE: Mohs micrographic surgery (MMS) provides the most effective treatment for most skin cancers. At our facility, MMS is available primarily for patients with basal and squamous cell carcinomas; however, access has been suboptimal due to shortage of surgeons. This has led to longer waiting periods. In this study, we aimed to evaluate whether the delay in treatment from biopsy to MMS led to larger post-MMS defects.

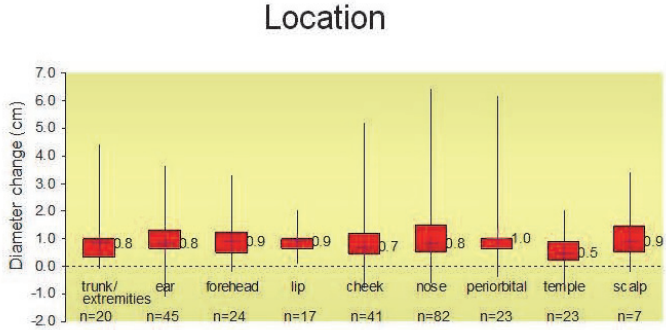
SUMMARY: Two hundred eighty-three MMS surgeries fulfilled inclusion criteria (219 basal cell carcinoma (BCC), 64 squamous cell carcinoma (SCC), 255 primary tumors, 28 recurrences). A regression model fit to all data points up to 12 months delay showed a diameter increase (cm) = 0.98 + 0.001*(months of waiting for surgery). There was no significant difference in mean or median diameter increase when comparing subgroups (see design).

DESIGN: This was a retrospective chart review of all dermatology patients undergoing MMS at our institution over a 4 year period. Time delay and diameter increase were calculated from biopsy size to MMS defect. We examined this effect on all subjects collectively, and by type of tumor (BCC vs. SCC), histologic subtypes, recurrence, size at presentation, and anatomic location. Sample size of 250 was selected to detect a slope of 0.03 cm/month for 80% power at the 5% level of significance. Mixed-effect regression models were used to analyze change in diameter over time.

CONCLUSION: The almost flat slope of the regression line suggests that time delay of up to one year does not affect final MMS defect size. Features considered high-risk, such as recurrences, location on the ear or lip, and large size at time of biopsy, did not show statistically significant differences in rate of growth. The retrospective nature of the study and other limitations exist.







020

TITLE: Retrospective evaluation of the safety of large skin flap, large skin graft and interpolation flap surgery in the outpatient setting

AUTHORS: *Jennifer L. DePry, DO[1]; Adam R. Schmitt, BA[2]; Jeremy S. Bordeaux, MD, MPH[1]*

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PURPOSE: We sought to determine the rates of postoperative infection, bleeding, necrosis and dehiscence in an outpatient surgery setting when utilizing large flap, large graft and interpolation flap repairs. Additionally, we examined the relationship between these outcomes with defect location, closure type, repair size and the use of anticoagulants, antiplatelets, or antibiotics.

SUMMARY: In 259 procedures, 32.82% of patients were given prophylactic antibiotics or were on long-term antibiotic therapy. Infection occurred in 5.02% of the procedures and there were infection rates greater than 8% for lower extremity, upper extremity and temple defects. Antibiotic use was not associated with an increased risk of infection (P=1.00). The infection rates for interpolation flaps, large flaps (≥ 30 sq cm), and full thickness skin grafts (≥20 sq cm) were 1.23%, 5.19%, and 16.67% respectively. Skin graft repairs were associated with a higher rate of infection (P=0.023). At the time of surgery, 54.83% of patients were on at least one anticoagulant or antiplatelet medication however their use was not associated with an increased risk of bleeding (P=1.00). There were no cases of hemorrhage and only a 2.7% incidence of hematoma. Hematomas occurred in 8.33% of large flap repairs on the cheek. The rate of dehiscence (all partial) was 0.77%. Necrosis (all partial) occurred in 4.25% of all procedures.

DESIGN: Medications, procedures and complications were recorded from the charts of the University's Department of Dermatology patients who required an interpolation flap, large flap (≥ 30 sq cm) or full thickness skin graft (≥20 sq cm) during a 66 month time period.

CONCLUSION: The risk of adverse events following interpolation flap, large flap (≥ 30 sq cm) and large graft (≥20 sq cm) repairs in the outpatient setting is low. Infection rates are low and not associated with antibiotic use. Routine antibiotic prophylaxis may not be needed when performing advanced surgical repairs in the outpatient setting. The risk of bleeding is low and there was no relationship between adverse bleeding outcomes and the use of anticoagulant or antiplatelet medications. These medications should not be stopped for advanced repairs in an outpatient surgical setting.

021

TITLE: The Incision for the Melolabial Transposition Flap should be made above the Melolabial Crease and Not Within It

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PURPOSE: The melolabial transposition flap is a commonly utilized flap for reconstruction of the nasal ala and sidewall. Conventional surgical dogma dictates that the inferior edge of the flap is designed within the melolabial crease in order to camouflage the scar. The downside

of this design, however, is apparent. After transposition, the pull at the flap base causes inferior displacement of the melolabial crease and blunting of the upper lip apical triangle. The result is distortion and asymmetry. We present a simple surgical pearl for improving the aesthetic outcome associated with the utilization of the melolabial transposition flap.

DESIGN: We propose that the entire melolabial transposition flap should be designed above the melolabial crease. By positioning the flap superiorly, and avoiding the melolabial crease altogether, blunting of the upper lip apical triangle and displacement of the melolabial crease can be avoided (Figure 1). The incision of the cheek usually heals with a minimal scar, and hides well in this region of the face. Furthermore, the contours of the apical triangle are preserved. Consequently, revision procedures aimed to fix these distortions are no longer needed. (Figure 2).

CONCLUSION: By designing the melolabial transposition flap above the melolabial crease, the surgeon can obtain a more symmetric and natural result. Blunting and displacement of the structures of the upper lip apical triangle is avoided. Importantly, the surgeon and patient can circumvent the inevitable secondary revisions required to fix an obliterated apical triangle.

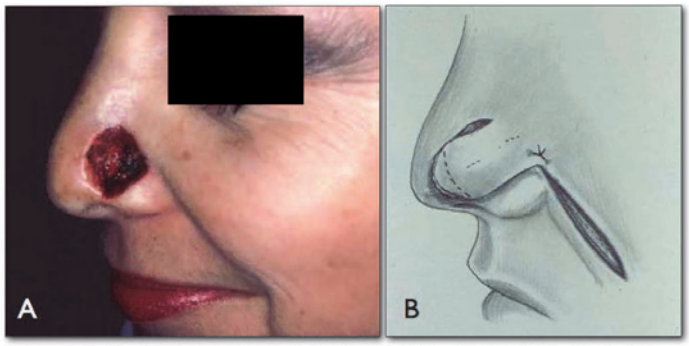

Figure 1. A. A representative defect of the nasal ala and sidewall. **B.** The incision for the melolabial flap is designed entirely above the melolabial crease, which allows the flap to pivot into position without distortion of the natural contours of the apical triangle.

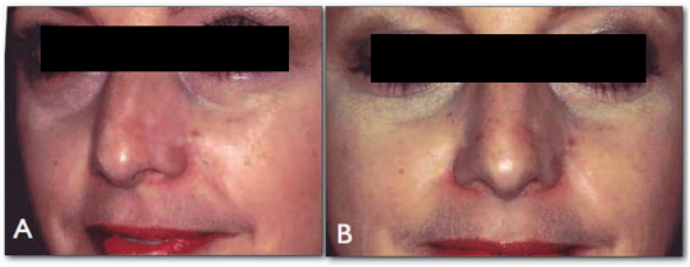

Figure 2. A-B. 2 year post-operative result. The incision for the melolabial flap has healed well. The structures of the apical triangle and the melolabial crease are symmetric and without distortion.

023

TITLE: Biopsy Site 'Selfies' - A Pilot Study for Wrong Site Surgery Prevention

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PURPOSE: Wrong-site surgery is defined by the National Quality Forum to be a serious reportable event and by the Joint Commission to be a sentinel event requiring reporting and investigation. Determining the biopsy site location of a skin cancer prior to surgery can often be difficult especially in areas of extensive field damage and multiple prior surgical procedures. Studies have shown that only relying on physician and patient assessment commonly resulted in the wrong site being identified. Given the digital age, photography prior to biopsy has been advocated, as it is cost-effective and timesaving. 'Selfie', a photograph taken of oneself with a Smartphone, is the 2013 Oxford Dictionary word of the year. We sought to study the implementation of biopsy site 'selfies' as a quality improvement measure for wrong site surgery prevention.

SUMMARY: In the first phase, data from 155 patient encounters was collected. The physician and patient were unable to correctly identify the previously biopsied site 16.1% and 25.5% of cases, respectively. A photograph was needed 20.6% of cases to ensure concordance of site identification between the physician and patient. The second phase of the study after biopsy site 'selfie' implementation is currently ongoing.

DESIGN: In the first phase, for each dermatologic surgery patient seen, the following was prospectively recorded: whether the dermatologic surgeon and patient were able to correctly identify the previously biopsied site without photography and whether photography was needed to ensure concordance of site identification between the physician and patient. In the second phase, every patient calling to schedule an appointment is being asked to use any portable digital device with photograph capability to take photographs of his/her previously biopsied site. After implementation of this biopsy site 'selfie' quality improvement measure, the following is being prospectively recorded: whether the dermatologic surgeon and patient are able to correctly identify the previously biopsied site without photography, whether the biopsy site 'selfie' is needed to identify the correct surgical site with complete confidence, and whether another intervention is needed other than the digital image to correctly identify the correct site (i.e. frozen biopsy, photographs from referring physicians, etc.).

CONCLUSION: Even a single wrong-site procedure is unacceptable. While pre-biopsy photography is an ideal standard, obtaining these photographs, if even available, often proves to be burdensome. Given the widespread use of digital devices with photograph capability, based on our preliminary analysis of our pilot study, we recommend that all dermatologic surgeons implement a protocol in which patients are requested to take biopsy site 'selfies'.

In our practice, this protocol has improved the efficiency in correctly identifying the surgical site while also providing the patient with further reassurance and confidence in the biopsy location as well as in the physician.

024

TITLE: Prevention of Wrong Site Surgery via Implementation of an Institutional Pre-biopsy Photography Protocol

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INSTITUTION: 1. Geisinger Medical Center, Department of Dermatology, Danville, PA, United States

PURPOSE: It is of utmost importance in surgery to be certain one is operating on the correct site, as wrong site surgery results in morbidity, loss of confidence, and potential malpractice claims. In cutaneous surgery, the use of anatomic site description, patient identification, Wood's lamp or tangential lighting, skin stretching, injection blebs, or frozen section biopsy help determine the location of the biopsy site, but the gold standard is pre-operative photography. We implemented a pre-operative photography protocol for our Dermatology Department and studied its effects on site identification in Mohs surgery.

SUMMARY: Prior to implementation of the pre-biopsy photography protocol, either the patient or surgeon was unsure of the biopsy site in 6% of cases (27/418) referred for Mohs surgery. Post-protocol implementation, of the 965 sites referred for Mohs surgery, 97 (10%) were ambiguous (either surgeon or patient uncertain of site). Of the ambiguous sites, the surgeon was able to correctly identify the biopsy site after photograph consultation in 65 cases (67%). Of the 31 ambiguous cases in which photographs were not helpful, only 1 followed the photography protocol, but experienced an acquisition issue (photograph in electronic medical record but unable to view). Of the ambiguous cases that did not follow the photography protocol, there were 21 cases from outside providers who do not provide photographs, 7 cases of an implementation issue associated with staff nonadherence (no photograph taken), and 1 case each of a technique issue (photograph with no landmarks) and timing issue (photograph downloaded late). Of the ambiguous cases in which the photography protocol was followed, the surgical site was able to be correctly identified in 98% of cases (64/65). In 23 unambiguous cases, photographs were also noted as helpful in determination of pre-biopsy size.

DESIGN: Nikon Coolpix digital cameras were provided to each physician in the Dermatology Department. Any lesion to be biopsied was marked with a gentian violet pen and photographed by the treating physician in such a way as to include nearby localizing anatomic structures, and photographs were uploaded into the electronic medical record. At the time of Mohs surgery, photographs were retrieved and examined to assist in site identification if needed. Data recorded included pre-protocol implementation (February 2012 – May 2012) ambiguous and unambiguous sites, and post-protocol implementation (May 2012 – February 2013) ambiguous and unambiguous sites before and after photograph consultation.

CONCLUSION: This study highlights the utility of implementing a departmental pre-operative photography protocol, resulting in significant quality improvement in patient care via correct identification of biopsy site and prevention of wrong site surgery. When the photography protocol was followed, surgeons were able to correctly identify the surgical site in 98% of ambiguous cases.

Pre-protocol implementation		
Total number of sites	418	
Unambiguous sites	391	94%
Ambiguous sites	27	6%
Physican & patient uncertain	12	
Physician uncertain	4	
Patient uncertain	11	
Post-protocol implementation		
Total number of sites	956	
Unambiguous sites	859	90%
Ambiguous sites	97	10%
Physican & patient uncertain	50	
Physician uncertain	31	
Patient uncertain	16	
Ambiguous sites - photograph helpful	65	67%
Ambiguous sites - photograph not helpful	31	32%
Outside provider (no photograph sent)	21	
No photograph taken or uploaded	7	
Photograph uploaded after Mohs appt	1	
Photograph unable to be viewed in EMR	1	
Photograph too close, no landmarks	1	
Unambiguous sites - photograph helpful (size)	23	3%

025

TITLE: Benchmarks in an Academic Mohs Surgery Practice

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PURPOSE: We present a detailed account of one year of Mohs surgery in an academic practice for our two senior surgeons. Our practice is comparable to previously reported academic practices. (Casey AS et al. Mohs Micrographic Surgery: How ACMS fellowship directors practice. Dermatol Surg 2009;35:747-56.) Our data may provide representative metrics / benchmarks for the current era of appropriate care and provide safety data to support the use of office-bases surgery.

SUMMARY: Each surgeon performs approximately 700 cases per year of Mohs surgery. 99% of Mohs surgery and repairs were performed in the office data from Surgeon 1 (Surgeon 2 pending) Average patient age 70 years 40% outside referrals, 60% from our institution. 42% from our county, 37% from the rest of the state, and 20% from out of state. 35% seen in consultation prior to the day of surgery. 12.5% of patients had multiple sites - always treated same day 81% had a preoperative permanent section biopsy

19 % had confirmatory frozen section biopsy day of Mohs surgery. 49% Nodular or nodular and infiltrative BCC 20% Invasive SCC 12% Infiltrative BCC 12% SCC in situ with follicular involvement 4% SCC in situ 2% Melanoma in situ (MART-1) 1% other (DFSP, etc) 98% tumor locations AUC areas H and M 2% ACU area L anticoagulant breakdown: 45% on aspirin, 7.5% on warfarin, 3.2% were on clopidogrel, 2% other. We do not hold anticoagulants. 7% of patients were immunosuppressed (CLL / transplant). Average preoperative lesion size 1.21 cm average postoperative lesion size 1.91 cm. Average 1.36 stages excision depth: 1% to dermis only, 59% to fat, 13% to muscle, 26% to fascia, periosteum, or perichondrium, and 1% to bone. Repair breakdown: 13% second intent , 3% purse string , 23% intermediate linear, 31% complex linear , 1% wedge, 7% advancement , 8% transposition, 5% island, 3% rotation, 2% pedicle, 7% full-thickness skin graft, less than 1% STSG, 1% referral All but one repair were done same day as Mohs surgery. The average patient was seen 1.3 times in the 90 day period following surgery. Complications: spitting suture 0.7%, minor bleeding 0.9%, hematoma 0.8%, infection 0.8%, pain requiring a phone call to the provider 0.9%, hypertrophic scarring 0.4%, full or partial repair necrosis 0.3%. No patients required postoperative hospitalization.

DESIGN: Detailed electronic medical record review of 1400 cases of Mohs surgery and repair performed by two Mohs surgeons at our institution.

CONCLUSION: Mohs surgery at our institution follows AUC guidelines. Our results demonstrate the safety of surgery in an outpatient office setting. The data provided reiterate older previously reported academic center findings and demonstrate that the vast majority of Mohs surgery in a referral practice is done in accordance with the AUC guidelines. This data may provide some useful benchmarks for the clinician performing Mohs surgery in a referral setting at an academic institution.

Table 1.

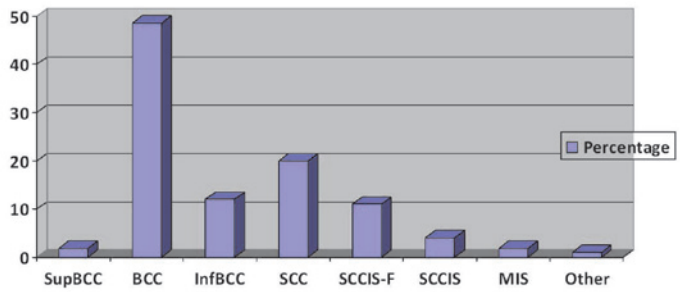


Table 2.

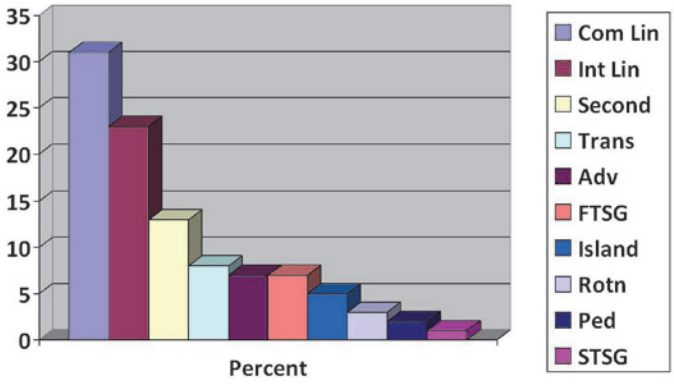
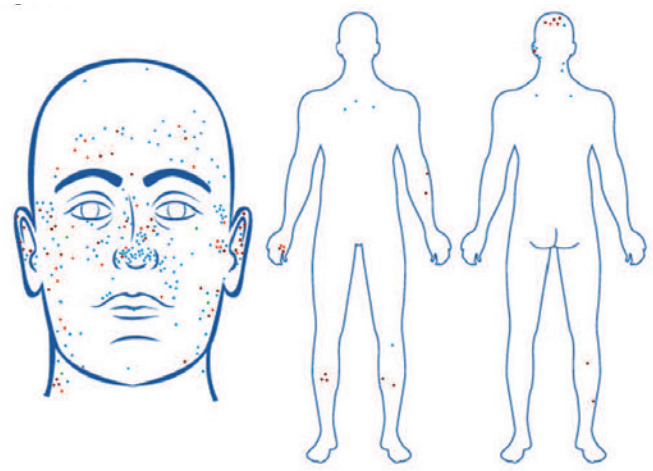


Figure 1.



026

TITLE: Cutaneous Tensile Strength Augmentation

AUTHORS: *Bailey Tayebi, MB, MBA[1]; Dana Mondo, MD[1]; Rebecca C. Tung, MD[2]*

INSTITUTIONS: 1. Loyola University, Maywood, IL, United States 2. Loyola University, Division of Dermatology, Maywood, IL, United States

PURPOSE: Atrophic, friable skin is a common finding in patients undergoing skin cancer surgery for upper and lower extremity lesions. In relatively uninjured skin, conventional suturing can be successfully employed for primary wound closure of most medium sized defects (1.5-3.0 cm). However, in many patients, the presence of reduced collagen and elastin fibers secondary to sun damage, steroid exposure, and age-related thinning of subcutaneous tissue leaves skin too delicate for traditional suture placement. In addition to locations with cosmetic or functional limitations, non-circular defects preclude wound closure utilizing tension reducing suture techniques such as purse string closures. To address these challenges, we have developed a novel use of tissue adhesive in patients undergoing Mohs reconstruction with promising

results. Cutaneous tensile strength augmentation (CTSA) is a technique in which 2-octyl cyanoacrylate is used to reduce skin shear propensity in medium-sized Mohs defects involving atrophic skin in high-tension locations.

SUMMARY: Six patients with non-melanoma skin cancer of the upper and lower extremities underwent Mohs Micrographic Surgery resulting in medium-sized defects within a background of thin, atrophic skin. CTSA was utilized to approximate wound edges while reducing skin shear propensity. Sutures remained in place for 18-21 days. Incisional wounds healed without complications, including tissue tearing and/or dehiscence, and required minimal wound care.

DESIGN: Following tumor removal, the wound is gently undermined and hemostasis is achieved. A single layer of adhesive is applied to a 1 cm margin circumferentially around the wound. Care is taken to avoid spilling adhesive into the wound itself, which may delay healing. The adhesive is allowed to polymerize for approximately 2-3 minutes. Two vertical mattress sutures are then placed at each end of the wound, bringing skin edges closer together for apposition and central tension relief. Subcutaneous sutures are placed near the midline of the wound as needed. Finally, closure is completed with simple interrupted epidermal sutures along the length of the incision. An additional layer of cyanoacrylate glue is applied over the suture line and butterfly strips are used over epidermal sutures to further decrease wound tension. If the lesion is on the lower extremities, a supportive self-adherent elastic wrap is placed to reduce swelling and minimize the possibility of dehiscence. Suture removal is delayed until 18-21 days post-procedure.

CONCLUSION: Given its ease of use, excellent clinical results, and low cost, CTSA proves to be an effective closure technique in skin cancer surgery. Furthermore, patients appreciate the lack of labor-intensive wound care demands and prolonged wound closure time periods. CTSA, therefore, is a worthwhile consideration in reconstruction of Mohs defects particularly in the setting of atrophic, fragile extremity skin.

Figure 1. Octyl Cyanoacrylate

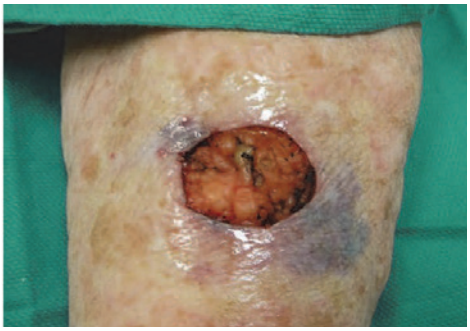


Figure 2. Simple Interrupted Sutures

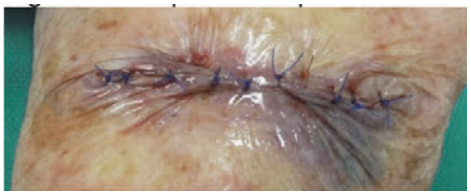
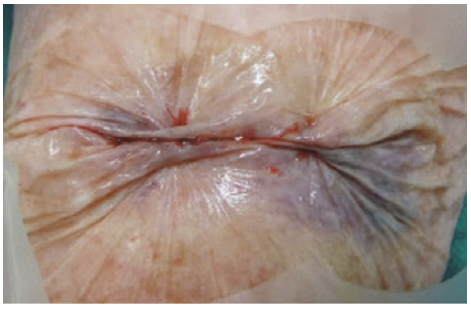


Figure 3. Vertical Mattress Sutures



027

TITLE: Changing Characteristics in Females receiving Mohs Micrographic Surgery for Non-melanoma Skin Cancer

AUTHORS: *Joanna L. Walker, MD[1]; Kachiu C. Lee, MD, MBE[1]; Olivia Linden, BA[1]; Antonio P. Cruz, MD[1]*

INSTITUTION: 1. Brown University, Department of Dermatology, Providence, RI, United States

PURPOSE: The incidence of cutaneous malignancy is rising due to multiple known and undetermined factors. While men suffer from more non-melanoma skin cancer than women, the increasing incidence in females may outpace that of men. We sought to evaluate variation over time in patient, tumor and treatment characteristics of female patients referred to Mohs micrographic surgery (MMS) for treatment of non-melanoma skin cancer (NMSC).

SUMMARY: A total of 407 females were treated with MMS in 2001 compared with 505 in 2011. The mean age of the female patients in 2001 and 2011 were 70±16 years and 70±15 years, respectively. There were fewer recurrent tumors in the contemporary group of patients (14% (58/407) in 2001, 5% (25/480) in 2011, $p<0.01$). More of the NMSCs were located in the periocular, nose, and jaw/chin regions in 2001 whereas there were significantly more treated on the upper extremities and pretibial areas in 2011 ($p<0.01$, Table 1). Females in 2011 had higher numbers of squamous cell carcinoma (SCC) and keratoacanthoma (KAC) type tumors, and in 2001 there were more basal cell carcinomas (BCC) ($p<0.01$, Table 2). Significantly more layers were taken in 2001 (1.7±0.9 vs. 1.5±0.7, $p<0.001$) but there was no difference in initial lesion size or final defect size. Repair types differed between 2001 and 2011 in female patients, with more primary closure and healing by secondary intention in 2011 ($p<0.01$ and $p=0.02$, respectively). There were also less plastic surgery referrals in 2011 ($p<0.01$, Table 3).

DESIGN: A retrospective chart review was conducted of all MMS records for female patients treated in the years 2001 and 2011 at a single university-affiliated academic Mohs center. Patient and tumor characteristics were collected after IRB approval was obtained. Recurrent tumors were classified as NMSC referred to Mohs due to recurrence after prior treatment. Analyses were conducted with $\chi 2$ and uni- and multi-variate analysis.

CONCLUSION: Multiple tumor and treatment characteristics in female patients referred to MMS for NMSC changed in ten years. The contemporary patients were less likely to be treated for recurrent tumors, suggesting improved cure rates with primary treatment over time, which could represent a possible cost-savings to the healthcare system. Greater numbers of SCC and KAC treated in 2011 corroborates with national trends indicating a more rapid rise in the incidence of SCC compared with other NMSC. This could reflect a changing risk profile including more chronic ultraviolet radiation exposure in the female population. The increase in tumors on the upper extremities and pretibial areas may represent rising incidence of NMSCs on the extremities or changing trends in MMS referral for non-facial lesions. More primary closures and secondary intention healing was performed in 2011, possibly indicating an increased consciousness towards cost-savings in today's healthcare economy.

Table 1: Location by Year

Location	2001	2011	Total	p-value
Forehead	64 (16%)	86 (17%)	150	NS
Periocular	**50* (12%)**	33 (7%)	83	<0.01
Nose	**145* (36%)**	110 (22%)	225	<0.01
Cheek	51 (13%)	65 (13%)	116	NS
Lip	36 (9%)	28 (6%)	64	0.054
Jaw/chin	**13* (3%)**	14 (3%)	27	<0.01
Ear	4 (1%)	26 (5%)	30	NS
Trunk/back	10 (2%)	29 (6%)	39	NS
UE	1 (0.2%)	**27* (5%)**	28	<0.01
Pretibial	4 (1%)	**46* (9%)**	50	<0.01
Scalp	19 (5%)	20 (4%)	39	NS
Neck	6 (1%)	17 (3%)	23	NS
Other	5 (1%)	4 (1%)	9	NS
Total:	408	505	913	

Percentage of total tumors within indicated year
UE: upper extremity, NS: non-significant

Table 2: Tumor Type by Year

Tumor Type	2001	2011	Total	p-value
BCC	**331* (81%)**	339 (67%)	670	<0.001
SCCIS	26 (6%)	50 (10%)	76	=0.055
SCC	49 (12%)	**95* (19%)**	144	<0.01
KAC	1 (0.2%)	**18* (4%)**	19	<0.01
Other	1 (0.2%)	1 (0.2%)	2	NS
Total	408	503	911	

Percentage of total tumors within indicated year
BCC: basal cell carcinoma, SCCIS: squamous cell carcinoma in situ, SCC: squamous cell carcinoma, KAC: keratoacanthoma, NS: non-significant

Table 3: Repair Type by Year

Repair	2001	2011	Total	p-value
Flap	44 (11%)	60 (12%)	104	NS
Graft	7 (2%)	16 (3%)	23	NS
Primary	152 (37%)	**268* (53%)**	420	<0.01
Secondary intent	16 (4%)	**39* (8%)**	55	0.02
Plastic Surgery referral	**188* (46%)**	122 (24%)	310	<0.01
Total	407	505	912	

Percentage of total tumors within indicated year
NS: non-significant

028

TITLE: Perioperative Antiseptic Practices in Mohs Micrographic Surgery: An ACMS Member Survey

AUTHORS: *Lindsey K. Collins, MD[1]; Thomas J. Knackstedt, MD[2]; Faramarz H. Samie, MD, PhD[2]*

INSTITUTIONS: 1. Dartmouth-Hitchcock Manchester, Lebanon, NH, United States 2. Dartmouth-Hitchcock Medical Center, Department of Dermatology, Lebanon, NH, United States

SUMMARY: Out of the 168 members who viewed the survey, 100 members responded. The majority of responders were between the ages of 36 and 55 (70%) and were male (68.69%). The most common practice environment was a single specialty group (38.8%) followed by single private practice (23.23%). Fellowship training was most commonly completed prior to 1999 (34.69%), and the majority of surgeons perform between 501-1,000 surgeries annually (45%). Except on the perioccular area, the most common antiseptic used when taking a Mohs layer was Hibiclens (4% chlorhexidine gluconate). Hibiclens was used by 62.5% of the responders on the head and neck and 70.93% on the torso or extremities. 7.5-10% povidone-iodine was the most commonly reported antiseptic used on the perioccular area both when taking a Mohs layer and during defect reconstruction (56.47% and 64.29%, respectively). During defect reconstruction, Hibiclens was also the most common antiseptic used on the head and neck excluding the perioccular area, and on the torso or extremities (67.82% and 75.86% respectively). The majority of responders have not recently changed their scrub preparation (93.9%). There was one reported case of keratitis associated with Hibiclens and Chloraprep. Two responders reported hypersensitivity reactions with povidone-iodine and 5 with Hibiclens. There was one reported case of superinfection each with 7.5-10% povidone-iodine, Hibiclens, and Chloraprep. 6.74% of responders reported using perioperative intra-incisional/ intra-lesional antibiotic injections.

DESIGN: An anonymous web-based 10-question survey was e-mailed to members of the ACMS. Five questions related to the demographics of the surgeon including age, gender, practice environment, year of fellowship training, and annual number of surgeries. The final 5 questions included the antiseptic used when taking a Mohs layer at various anatomic locations, the antiseptic used for defect reconstruction at various locations, associated side effects encountered, any changes made to scrub preparation in

the last year, and the use of perioperative intra-incisional/ intra-lesional antibiotic injections.

CONCLUSION: Although there are a variety of antiseptic techniques available, the majority of the members of the ACMS who responded to the survey are safely using Hibiclens when taking a Mohs layer and during defect reconstruction for locations excluding the perioccular regions. The most commonly reported side effect associated with Hibiclens use was a hypersensitivity reaction, reported by only 5 providers.

029

TITLE: Assessment of the National Comprehensive Cancer Network (NCCN) Treatment Recommendations for Cutaneous Squamous Cell Carcinoma (cSCC): Single-institution Experience

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INSTITUTIONS: 1. Saint Louis University, Department of Dermatology, St. Louis, MO, United States 2. Saint Louis University, Center for Outcomes Research, St. Louis, MO, United States 3. Saint Louis University, School of Medicine, St. Louis, MO, United States 4. Saint Louis University, Otolaryngology-Head and Neck Surgery, St. Louis, MO, United States

PURPOSE: The NCCN has published algorithms to guide the treatment of cSCC. We sought to evaluate and compare our management of cSCCs with the NCCN recommendations.

SUMMARY: Complete data was available for 265 of 296 cases. Most tumors (n= 231, 87%) were classified as "high risk". Size was the most common risk factor resulting in a "high risk" classification – ≥ 6 mm on "mask areas of the face" or ≥10 mm on forehead, scalp, cheeks, and neck. Thirteen percent (n= 34, 13%) of tumors were classified as "low risk." (Figure 2) All "high risk" tumors underwent Mohs surgery or excision with complete circumferential peripheral and deep margin assessment with frozen or permanent sections, per NCCN treatment guidelines for "high risk" tumors. Consistent with NCCN guidelines, 4 patients were recommended for adjuvant radiation (XRT) per NCCN – two due to perineural invasion (PNInv) and two due to positive margins. Three completed XRT; the one patient with positive margins refused further XRT treatment. The treatment plans for "low risk" tumors varied from the NCCN guidelines which recommends Mohs surgery only if positive margins are found after initial excision. All patients with "low risk" tumors received Mohs surgery as the initial treatment. For "low risk" tumors, the NCCN recommends curettage and electrodessication (C&E) in non-hair bearing areas, excision with postoperative margin assessment if 4-6 mm surgical margins and secondary repair, linear repair or skin graft can be performed, or radiation for nonsurgical candidates. (Figure 3)

DESIGN: All head and neck cSCC seen in the dermatology department at a tertiary care center from July 2010 to November 2011 were classified as "high risk" or "low risk" by NCCN guidelines, Version 1.2012. Only 1 of 12 risk factors (Figure 1) is required to be considered "high risk" per NCCN. Actual tumor treatment was compared to NCCN guideline recommendations.

CONCLUSION: The vast majority (87%) of cSCC cases treated at the center were classified as "high risk" per NCCN and their treatment was aligned with NCCN recommendations. Of note, the surgery needed to clear margins ranged from Mohs and staged excision alone or with adjuvant rhinectomy or wide local excision on the scalp requiring a calvarium drill. The treatment of "low risk" tumors, 13% of all cases, underwent Mohs surgery as initial treatment; NCCN guidelines do not recommend Mohs surgery as initial treatment. All "low risk" tumors were appropriate for Mohs surgery per the Mohs College Appropriate Use Criteria (AUC), primarily by size criterion (≥5mm). NCCN guidelines represent significant progress in the coordination of interdisciplinary cancer care. As skin cancer experts, Mohs surgeons should be attentive to risk staging attributes of cSCC tumors and contribute data which can guide the development of precise staging and evidence-based treatment guidelines.

Figure 1. NCCN Classification of "high risk" cSCC Tumors

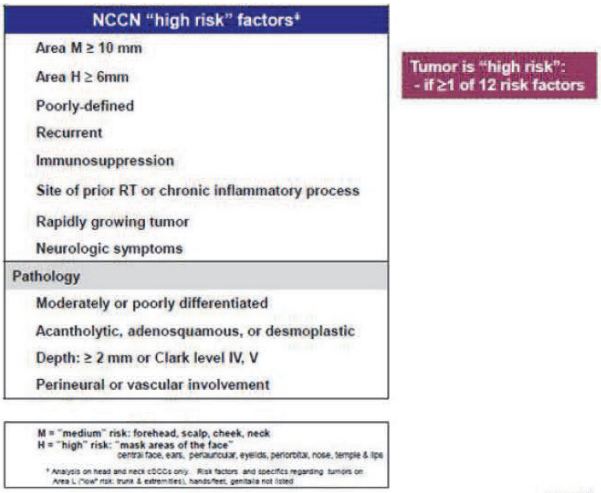


Figure 2. Proportion of "low risk" vs. "high risk" cSCCs by NCCN Guidelines

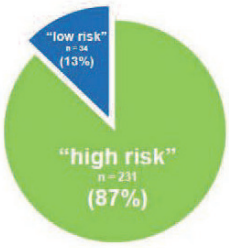
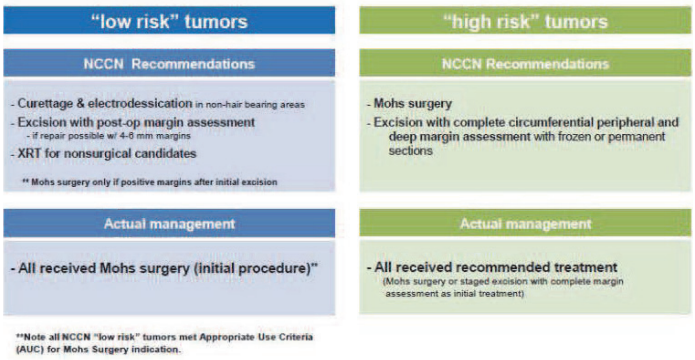


Figure 3. Comparison of NCCN Recommendations and Actual Management



030

TITLE: Detecting Spindle Cell Squamous Cell Carcinomas with Toluidine Blue

AUTHORS: *Diane N. Trieu, MD[1]; Anna Drosou, MD [1]; Arash Kimyai-Asadi, MD[1]; Leonard H. Goldberg, MD[1,2]*

INSTITUTIONS: 1. DermSurgery Associates, Houston, TX, United States 2. Weill Cornell Medical College, Department of Dermatology, Houston, TX, United States

PURPOSE: Spindle cell squamous cell carcinomas are a rare variant of squamous cell carcinomas (SCCs). Histologically, these tumors tend to infiltrate with single cells and can be difficult to visualize without immunohistochemical stains. Classically, squamous cell carcinomas are often stained with hematoxylin and eosin (H&E). The purpose of this case report was to demonstrate whether toluidine blue (T-blue) helps in visualizing spindle cell SCCs versus H&E.

SUMMARY: Staining with T-blue helps identify single infiltrating spindle tumor cells. The T-blue stains the mucopolysaccharides produced from tumor cells a pink to magenta color, thus revealing tumor cells. The stain also enhances the cellular detail of the squamous cell features of the abundant eosinophilic cytoplasm and vesicular nucleus. Figure 1. A) T-blue—Pink staining of the mucopolysaccharides produced by the tumor cells (4x). B) H&E—No obvious stromal changes appreciated (4x). Figure 2. A) T-blue—Infiltrative squamous cells (arrows) surrounded by pink stained mucopolysaccharides (10x). B) H&E—Squamous cells blend into the background of inflammatory cells (10x).

DESIGN: A patient with a biopsy proven diagnosis of spindle cell SCC was treated with Mohs surgery. The Mohs frozen sections were stained with both T-blue and H&E. The slides were then viewed at magnifications of 4x and 10x and compared to each other.

CONCLUSION: Spindle cell SCCs can behave aggressively and should warrant treatment with Mohs surgery. Although Mohs surgeons typically use H&E staining when reading frozen sections for SCCs, spindle cell SCCs can be more infiltrative and difficult to interpret with only using H&E. The T-blue facilitates tumor detection by means of the pink to magenta stromal changes and displaying the cellular detail of the tumor cell. One can consider adding T-blue when performing frozen sections for spindle cell SCCs for ease of tumor recognition.

Figure 1A&B.

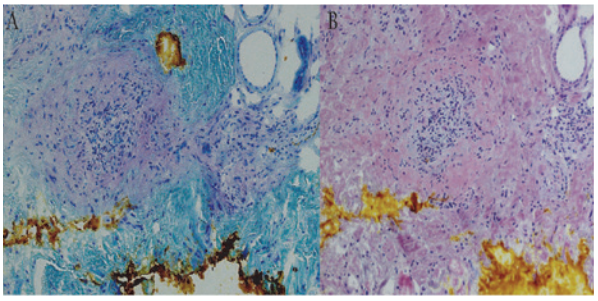


Figure 2A.

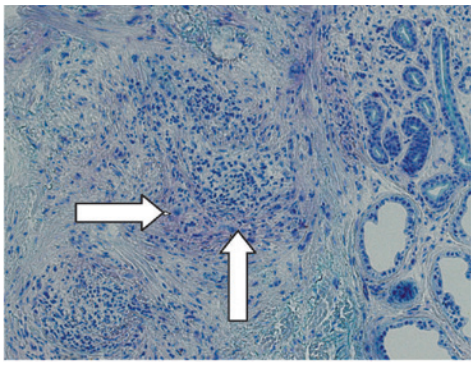
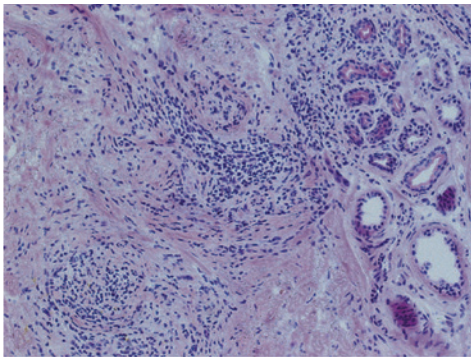


Figure 2B.



031

TITLE: Nail Surgery among Mohs Surgeons: Prevalence, Safety and Practice Patterns

AUTHORS: *Alyssa Findley, MD[1]; Nathaniel Jellinek, MD[1,2]; Nicole F. Velez, MD[1]; H. William Higgins, MD, MBE[3]*

INSTITUTIONS: 1. Dermatology Professionals, Inc., East Greenwich, RI, United States 2. University of Massachusetts Medical School, Division of Dermatology, Worcester, MA, United States 3. Brown University, Department of Dermatology, Providence, RI, United States

PURPOSE: Nail procedures comprise a field of dermatologic surgery that is relatively deficient of data-driven guidelines. We sought to determine the specific nail procedures that Mohs surgeons are performing, ranging from shave and punch biopsies to more invasive techniques like en bloc excision of the nail unit. Additionally, we sought to gain more information on how surgeons obtain a bloodless field, specifically regarding the use of a tourniquet and/or epinephrine-containing anesthesia. Finally, we studied complications that surgeons encountered when performing nail surgery.

SUMMARY: Our response rate for the survey was approximately 17% (N=164). Accounting for 298,161 physician-years, our data demonstrate that those surgeons who have performed up to 10 nail surgeries in fellowship are currently performing on average twice as many as those who performed less than 10 nail procedures during their training ($p<.001$). More experienced surgeons, those with greater than 5 years of training, are performing an increased number of nail procedures compared to those who more recently completed their fellowship training (17 vs. 9 surgeries per year, respectively, $p<0.01$). The majority of responders perform Mohs surgery for nail tumors (93.1%). 86% of respondents perform punch biopsies; 66% perform shave biopsies ($p<0.01$). Years in practice (≤5 vs. >5 years) did not influence type of biopsy performed. Those who performed ≥ 10 nail biopsies during fellowship were more likely to perform shave biopsies than those with less experience during fellowship (76% vs. 57%, respectively, $p<.01$). There seems to be a relatively consistent approach towards obtaining a bloodless field, with over half of surgeons using a tourniquet or modified glove, and 71.4% using epinephrine-containing anesthesia. Raynaud's disease/phenomenon and peripheral vascular disease were considered the most significant contraindications to epinephrine use on the digits. The majority of surgeons who completed the survey denied any complications when performing digital surgery. However, persistent paresthesias, followed by prolonged ischemia and infection were the most common complications. There was only one reported case of digital infarction.

DESIGN: A questionnaire was sent via Survey Monkey to all members of the Mohs College.

CONCLUSION: Those surgeons who perform a greater number of nail procedures during fellowship are more likely to continue this practice after training. The majority of Mohs surgeons use epinephrine-containing anesthesia or a tourniquet, and there have been few long-term complications as a result of this practice. This survey supports the safety of nail surgery performed by Mohs surgeons.

032

TITLE: The Purse-string Bipedicle Combination Flap for the Repair of Scalp Defects Following Mohs Surgery

AUTHORS: *Kenny J. Omlin, MD[1]; Faranak Kamangar, MD[1]*

INSTITUTION: 1. University of California, Davis, Department of Dermatology, Davis, CA, United States

PURPOSE: The scalp is a very common location requiring Mohs surgery for the effective removal of non-melanoma skin cancers. Decreased tissue laxity of the scalp combined with considerable vascular perfusion can pose a significant challenge to the reconstructive surgeon. Repair techniques described in the literature include secondary intention, primary closure, full thickness/split thickness skin grafts and a variety of flaps. We describe a novel technique utilizing a combination of an intradermal purse-string suture technique combined with a bipedicle flap for the repair of a variety of scalp defects.

DESIGN: 27 patients underwent Mohs surgery for the removal of either squamous cell or basal cell carcinoma involving the scalp. Defect sites included frontal, parietal and occipital regions of the scalp. Defect size ranged between 1.0cm x 1.0cm to 8.3cm x 3.2cm. Immediate repair was performed for all cases utilizing the purse-string bipedicle repair technique. The surgical site is meticulously undermined and an absorbable purse-string stitch is placed. After determining the ideal tissue reservoir, which will serve as a bipedicle flap, a curvilinear incision is made at a length approximately 2-3x the width of the surgical site defect. The bipedicle flap is widely undermined at the level of the galea aponeurotica (galeotomy) and the bipedicle flap is subsequently advanced to achieve complete closure of the primary surgical defect (Figure 1, Figure 2) (Animation movie).

CONCLUSION: The purse-string bipedicle combination flap is an excellent repair option for a wide variety of scalp defects following Mohs surgery. The centralized vector forces created by the purse-string stitch results in a significant decrease in size of the primary defect. Strategic placement of a bipedicle flap and subsequent galeotomy, adjacent to the purse-string repair, allows for further tissue mobility and complete closure of the surgical defect. The combination of excellent aesthetic outcomes, minimal operative time, technical ease, and minimal patient morbidity make the purse-string bipedicle combination flap a valuable addition to the armamentarium of the reconstructive surgeon (Figure 3).

(Figures on next page)

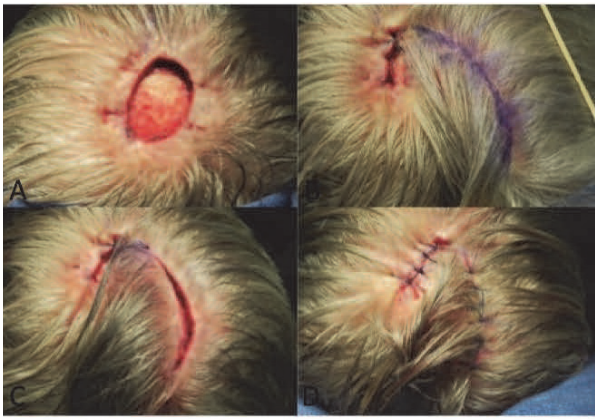


Figure 1: A) Scalp defect; B) Purse-string in place;
C) Bipedicle flap incised; D) Purse-string Bipedicle flap in place

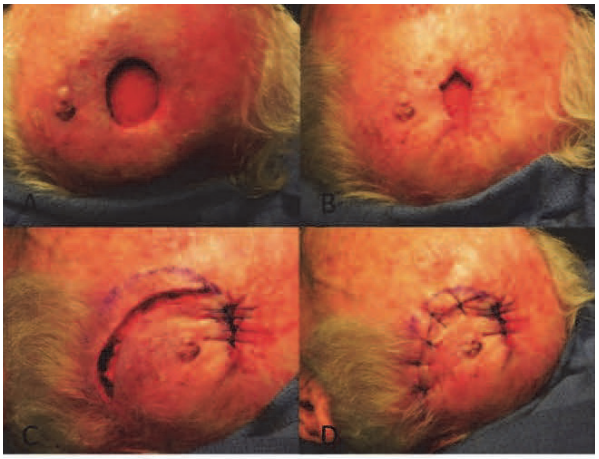


Figure 2: A) Scalp defect; B) Purse-string in place; C) Bipedicle flap incised; D) Purse-string Bipedicle flap in place

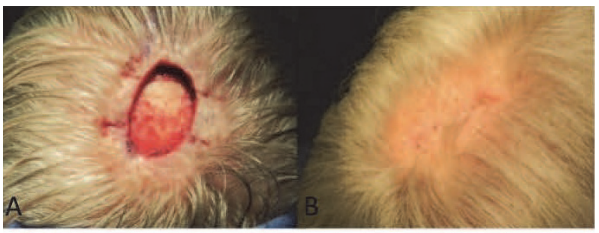


Figure 3: A) Scalp defect; B) 6-Month post-operative outcome

033

TITLE: Assessing the Predictive Probability of Melanoma Using Data Provided by a Multispectral Digital Skin Lesion Analysis Device

AUTHORS: *Jane Yoo, MD, MPP[1]; Natalie Tucker, BA[2]; Darrell Rigel, MD, MS[3]*

INSTITUTIONS: 1. Albert Einstein College of Medicine, Department of Dermatology, New York, NY, United States 2. Mela Sciences, Inc., Irvington, NY, United States 3. New York University, Langone Medical Center, New York, NY, United States

PURPOSE: Risk prediction models are often used as research tools to help identify individuals at high risk of specific cancers in the general population. Developing statistical models that evaluate the probability of developing cancer over a defined period of time allows for earlier or more frequent screening and counseling as well as earlier intervention and treatment. While many different diagnostic tools for melanoma have emerged in the past decade, very few have quantified their predictive capacity for melanoma or other high risk pigmented lesions. A Multispectral Digital Skin Lesion Analysis device (MSDSLA) combines multispectral data acquisition and novel feature generation with automatic quantitative analysis. The automatic quantitative analysis utilizes a lesion classifier score derived from 75 features to evaluate the degree of 3-dimensional morphological disorganization of pigmented skin lesions.

SUMMARY: The logistic regression model used in this study was: logit(p) =a + b1x1+ b2x2 + ….+ bixi where p is the calculated probability of melanoma and x1x 2 xi are explanatory variables. The model logit(p)=a+bx is equivalent to p=probability of melanoma (or of lesion considered for biopsy) = e^(a+bx) / 1+e^(a+bx) For the Melanoma model: p=probability of melanoma = e^(-3.8+0.53x) / 1+e^(-3.8+0.53x) or p/1-p=odds of melanoma For every one unit increase the MSDLA classifier score, the odds of favoring the presence of MM/AMH/HGDN increased by 1.7. For the Melanoma/AMH/HGDN model: p=probability of MM/AMH/HGDN = e^(-3.3+0.49x) / 1+e^(-3.3+0.49x) or p / 1-p= odds of melanoma/AMH/HGDN For every one increase in unit in the MSDLA classifier score, the odds of favoring the presence of melanoma increased by 1.6.

DESIGN: Data from 1632 pigmented lesions analyzed by a Multispectral Digital Skin Lesion Analysis device were used to perform a logistic regression analysis. Final pathological diagnoses were assigned to four distinct categories: 1) High grade dysplastic nevus (HGDN), 2) Atypical melanocytic hyperplasia (AMH), 3) Malignant melanoma (MM) or, 4) Other. The MDSLA device assigns classifier scores, or numerical values based on analytical values from a lesion's level of structural disorder to pigmented lesions. By applying these values, we derived logistic regression models to determine the probability distribution for Malignant Melanoma and for lesions that might be considered suitable for biopsy (Melanoma or Atypical Melanocytic Hyperplasia or High Grade Dysplastic Nevus).

CONCLUSION: By performing a univariate logistic regression analysis, we were able to calculate the predictive probability of a pigmented lesion for melanoma or for consideration for biopsy based on data obtained from a multispectral digital skin lesion analysis skin lesion analysis device. This is the first study, to our knowledge, that has evaluated a dermatological technological instrument for its potential quantitative predictive capacity for presence of melanoma and other high risk pigmented lesions.

034

TITLE: Angioinvasive Cutaneous Squamous Cell Carcinoma on the Scalp: A Case Report and Review of the Literature

AUTHORS: *Megan Morrison, DO[1]; Kent J. Krach, MD [1,2]*

INSTITUTIONS: 1. St. Joseph Mercy Hospital, Ypsilanti, MI, United States 2. Midwest Skin Cancer Surgery Center, Clinton Township, MI, United States

PURPOSE: The purpose of this study is to present a case of intravascular squamous cell carcinoma (SCC) and review the literature on intravascular invasion of cSCC and its potential as an additional independent risk factor in the prognosis of cSCC. We will also review the current 2010 AJCC guidelines for cSCC as well as the alternative guideline staging system introduced in 2013.

SUMMARY: Cases of cSCC with lymphatic or vascular vessel invasion have an increased risk of regional and distant metastasis influencing prognosis. Despite this, lymphatic and vascular invasion are not considered in most studies, unlike perineural invasion, and therefore they are not included in the most recent AJCC staging criteria. In a study by Moore et al, the presence of lymphatic/vascular invasion and the depth of invasion had the most compelling association with lymph node metastasis, with P values of <0.0001 and 0.001. Lymphovascular invasion was seen histologically in 40% of patients with lymph node metastases and, by contrast, in 8% of patients without metastatic disease. These findings were confirmed by Peat et al, whose study revealed that the two highest risk factors for development of metastatic disease are poor histological differentiation and perineural or lymphovascular infiltration.

DESIGN: Literature review

CONCLUSION: It is clear from our literature review that lymphatic or vascular invasion implies a poor prognosis, but there is no evidence to support this as an independent risk factor at this time. As there is an increased risk of metastasis seen with intravascular cSCC, and more studies need to be done to evaluate standardized treatment recommendations to help stratify the prognostic value of high-risk tumor features. Some studies have recommended elective treatment of the draining nodal basins with either surgery or radiation therapy when adverse features such as invasion beyond the subcutaneous fat and lymphovascular invasion are identified in the primary lesion.

Figure 1.

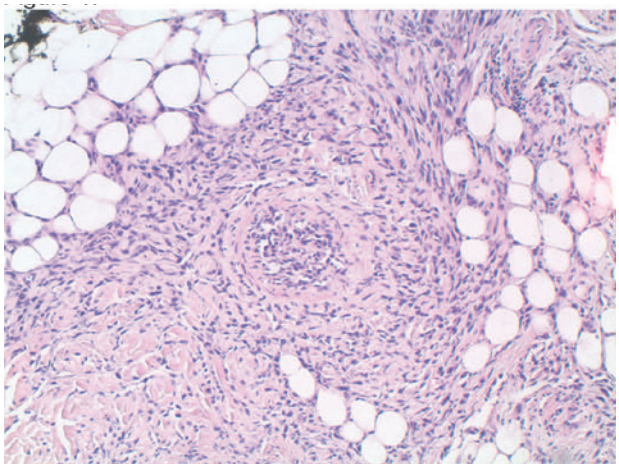


Figure 2.

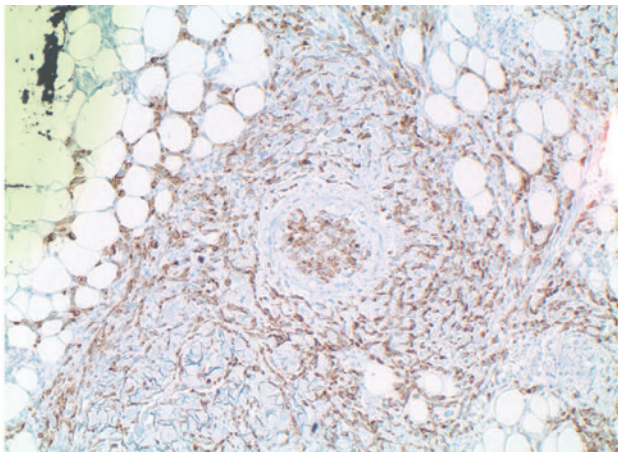
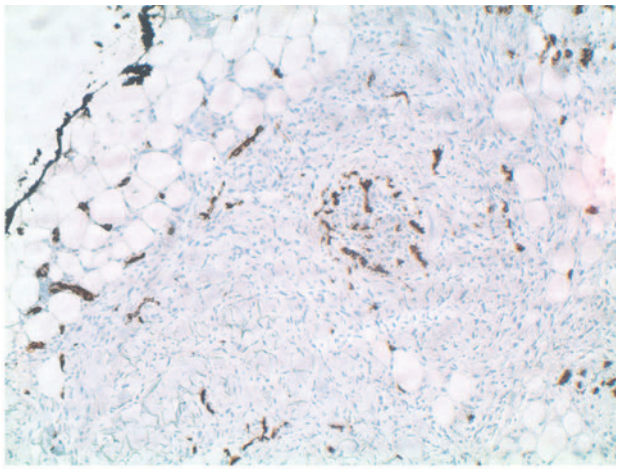


Figure 3.



035

TITLE: **Two-Staged Bilobed Interpolated Flap (Nasal Sidewall-to-Ala Interpolation Flap or Nose-to-Nose Interpolation Flap)**

AUTHORS: *Cynthia Abban, MD, PhD[1]; Hakeem Sam, MD, PhD[1]*

INSTITUTION: 1. University of Pittsburgh, Department of Dermatology, Pittsburgh, PA, United States

PURPOSE: Reconstruction of nasal alar defects poses a challenge due to the aesthetic and functional goals of the repair. Herein, we present a two-staged bilobed interpolated flap (nasal sidewall-to-ala or nose-to-nose interpolation flap) repair for a Mohs defect of the nasal ala. This repair was favored over alternatives because: (1) a traditional single-staged bilobed flap design run the risk of blunting the prominent superior ala crease in our patient, (2) a nasal donor site was used in a staged flap design, keeping reconstruction within the nasal subunit, avoiding possible donor site morbidity of a cheek or forehead donor site and keeping incisions largely within desirable borders of cosmetic subunits.

DESIGN: A 53 year-old white man presented with a basal cell carcinoma involving the left nasal ala. Mohs micrographic surgery was performed to obtain clear tumor margins. The final defect measured 1.3 cm x 1.2 cm (Figure 1). A modified (Zitelli) bilobed flap design was further modified for an interpolated repair based on the nasal sidewall. No standing cone was to be removed. The range of the entire flap was in a ninety degree quadrant relative to the axis of the primary defect with both lobes of the flap confined to this quadrant. To help position the lobes, two imaginary arcs were incorporated in the design with an inner and outer arc at the mid-section of the defect and the outer arc beginning at the superior portion of the defect respectively. The normal take-off incision for the first lobe was displaced superiorly to rest within the ala crease, while closure of the secondary defect placed the scar at the border between the nasal sidewall and dorsum. Both lobes were designed to be of similar size and slightly longer than usual (Figure 2). Wide undermining of flaps and defect was done to relieve pivotal restraint and prevent flap pin-cushioning. Flap was elevated and secured into place after meticulous hemostasis (Figure 3). Flap take down was completed at week 3 (Figures 4 and 5). At 6 weeks post-procedure, patient had a well healed flap with preservation of ala crease and nasal ala symmetry (Figure 6).

CONCLUSION: A two-staged bilobed interpolated flap was constructed without a cone removal as compared to the Zitelli design for the bilobed flap which incorporates an excision of a dog-ear redundancy near the base of the flap in a single-stage repair. Potential donor site morbidity of the staged paramedian forehead or cheek-to-nose flap or blunting of the ala crease was avoided. Although our reconstruction design involved a two-staged process, this approach enabled us minimize anatomic distortion while incorporating an adjacent nasal side wall skin with similar tissue consistency to our area of defect.

Figure 1.

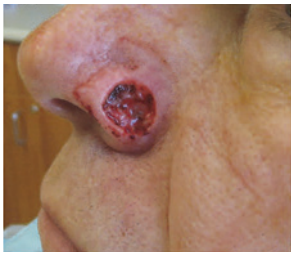


Figure 2.

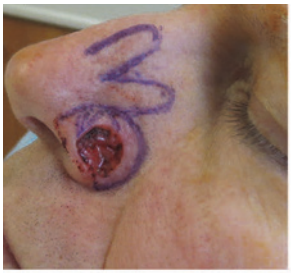


Figure 3.

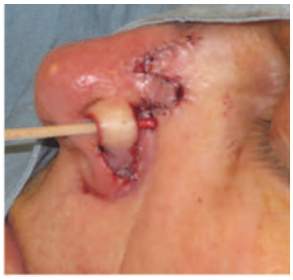


Figure 4.

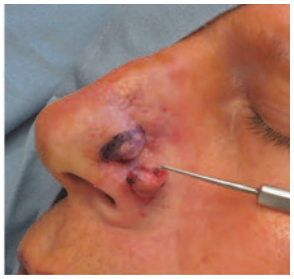


Figure 5.

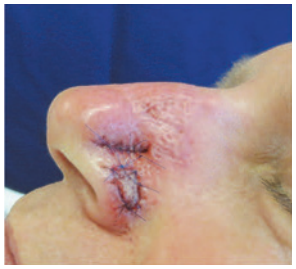
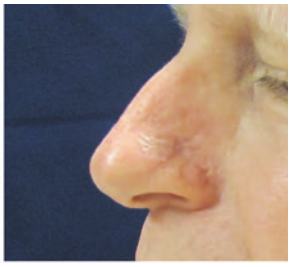


Figure 6.



036

TITLE: **In-transit Metastasis of Squamous Cell Carcinoma in the Setting of Herpes Zoster**

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PURPOSE: We present a case of metastatic squamous cell carcinoma (SCC) in a zosteriform pattern following a herpes zoster flare in an otherwise immunocompetent patient. Cutaneous SCC metastasizing in a zosteriform distribution is exceptionally rare with the majority of cases reported in immunocompromised individuals. To our knowledge, only two cases have been reported in immunocompetent patients.

SUMMARY: A 55-year-old healthy male presented with an SCC of the vertex scalp penetrating to fat. His history included recently resolved herpes zoster (HZV) on his right scalp and forehead (V1 distribution). After resolution of HZV, a SCC nodule was noted on his right scalp in the V1 distribution. Several months following tumor extirpation with MMS, the patient began to develop multiple

subcutaneous nodules of SCC within 3-5 centimeters of the original lesion and within the distribution of his post-herpetic neuralgia. These tumors, which lacked epidermal connection, were considered intransit metastases. He subsequently underwent radiation therapy (XRT) to the right scalp. Soon after completion, he developed a new lesion at the anterolateral edge of the irradiated zone. This lesion was treated by MMS. A second course of XRT was performed to treat the right anterior scalp in order to prevent further in-transit metastases. Despite this treatment, the patient continued to develop new lesions in the radiated region. CT soft tissue neck and MRI brain/orbits showed no lymphadenopathy or abnormal intracranial enhancement or mass. No perineural invasion was noted in the primary SCC. Whole exome sequencing of the tumors is being pursued to better understand the relationship of the primary lesion to the metastatic tumors.

DESIGN: We describe a case of in transit metastases of a cutaneous SCC in which the metastatic lesions appear to follow the distribution of a recently resolved case of HZV.

CONCLUSION: This is a challenging case of SCC of the scalp treated in the setting of recently resolved HZV. Subsequent in-transit metastases appeared to cluster closely in the distribution of the HZV neuralgia. This pattern of spread raises the question of a relationship to the region of HZV, including the possibility of localized immune suppression. Treatment with XRT failed on two occasions and the lesions, which likely spread through the lymphatics or blood vessels, have proved very challenging to treat. Excision of the tumors presents the challenge of poor healing in a radiated field and marginal recurrence. The patient is currently planned to undergo treatment with intralesional interferon (IFN) alpha-2b injections. Other options include intralesional interferon (IFN) alpha-2b injections and systemic chemotherapeutic agents such as cetuximab. Clinical trials are evaluating the role of immunotherapeutics such as anti-PD-1 (programmed death-1 receptor on T cells) monoclonal antibodies that aid in tumor eradication.

037

TITLE: Treatment of Dermatofibroma Sarcoma Protuberans Using Modified Mohs Micrographic Surgery

AUTHORS: *Vineet Mishra, MD[1]; Lee Miller, MD[2]; Ben Kelley, MD[2]; John G. Hancox, MD[2]; Hubert T. Greenway, Jr., MD[2]*

INSTITUTIONS: 1. University of Texas, San Antonio, TX, United States 2. Scripps Clinic, La Jolla, CA, United States

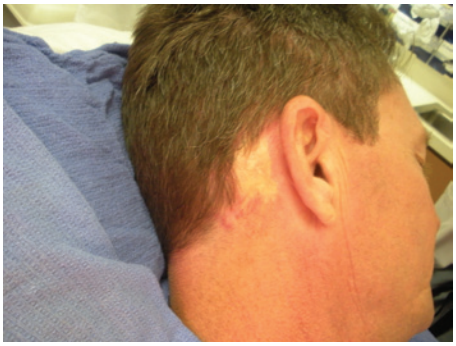
PURPOSE: The purpose of this study was to examine the use of modified Mohs micrographic surgery (MMS) for dermatofibroma sarcoma protuberans (DFSP) at a single institution by one surgeon.

SUMMARY: Of the 43 patients treated with modified MMS for DSFP, there was one identifiable recurrence 26.2 years later after surgery (Figure 1). A metastatic work-up proved to be unremarkable and the patient has no evidence of further recurrence 2 years post-operative.

DESIGN: The authors conducted a retrospective analysis of 43 patients with DFSP who were treated with modified MMS over the past 28 years. This is a retrospective analysis using the data of one surgeon at one institution. There were no cases of the fibrosarcomatous variant.

CONCLUSION: Our data support the growing literature that modified MMS achieves excellent cure rates and local control for DFSP. Life-long follow-up is indicated as evidenced by the recurrence 26 years later.

Figure 1. Erythematous nodule at the hairline inferior and posterior to the original surgery site which proved positive for DFSP after 26.2 years.



038

TITLE: Role of Human Papillomavirus in Cutaneous Squamous Cell Carcinoma: A Meta-analysis

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PURPOSE: Importance: The role of HPV in cutaneous squamous cell carcinoma (cuSCC) has not been well defined in the general population, although the clinical behavior and epidemiology of SCC suggests a viral etiology. Past studies have shown conflicting results, and studies showing HPV infection in SCC have reported variable ranges of detection. Objectives: We sought to determine if there is a significant association between HPV and cuSCC and to determine whether cuSCC from immunosuppressed patients are more likely to carry HPV than cuSCC from immunocompetent patients.

SUMMARY: In the pooled data, cuSCC were more likely to carry HPV than normal skin (pooled ES 3.43, 95% CI 1.97-5.98, p>0.0001) in both immunosuppressed and immunocompetent patients. An increase in HPV prevalence was found in tumors from immunosuppressed patients compared to immunocompetent patients (pooled ES 3.01, 95%CI 2.00-4.52, p<0.0001).

DESIGN: Data Sources: Pubmed, Embase, Web of Science, CINAHL and Cochrane Library through June 2012 Study

Selection: All relevant published literature on human papillomavirus AND skin cancer or cutaneous squamous cell carcinoma were evaluated by multiple reviewers. Of 3661 records retrieved, 29 articles met inclusion criteria. Data Extraction: We performed a systematic review of the literature and abstracted data from articles in which skin samples were collected by biopsy, HPV detection was done by PCR, and a minimum of 10 cases and 10 controls were used. Outcome and Measures: Pooled effect size and 95% confidence intervals were calculated using random effects meta-analysis using the inverse variance (Dersimonian and Laird) method. Heterogeneity between studies was assessed with two indicators, the I2 and Q statistics. Funnel plots were used to assess publication bias.

CONCLUSION: These results contribute to the body of evidence that HPV is associated with cuSCC. Higher HPV burden in tumors from immunosuppressed patients compared to immunocompetent patients may have therapeutic implications. While further research is needed and the significance of HPV positive tumors is unknown, it may lead to more targeted treatment modalities, reduction of disease burden, and better patient outcomes.

039

TITLE: Basaloid Folliculolymphoid Hyperplasia in the Setting of Erythrodermic Sezary Syndrome

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INSTITUTIONS: 1. University of Minnesota, Department of Dermatology, Minneapolis, MN, United States 2. Twin Cities Dermatopathology, Plymouth, MN, United States

PURPOSE: Background: Basaloid folliculolymphoid hyperplasia is a rarely reported histologic presentation of follicular cutaneous T-cell lymphoma (CTCL). To our knowledge, this finding has never been documented in sezary syndrome. Here we report what we believe to be the first case of basaloid folliculolymphoid hyperplasia in a patient with sezary syndrome but without prior clinical evidence of follicular CTCL. The basaloid folliculolymphoid hyperplasia was found incidentally on frozen section during routine Mohs micrographic surgery (MMS) for a nodular basal cell carcinoma (nBCC).

SUMMARY: Case Presentation: A 77 year-old man with known erythrodermic sezary syndrome presented with a non-healing ulcerated pearly papule with rolled borders and crust on the left cheek. Routine shave biopsy revealed a nBCC. During MMS, frozen section of stage I showed focal areas of typical appearing nBCC but also demonstrated hyperplasia of basaloid cells reminiscent of nBCC arranged in a bizarre manner around follicles without the findings of peripheral palisading and retraction artifact (Figure I and Figure II). Additionally, epidermotropic and folliculotropic atypical lymphocytes with hyperchromatic nuclei are evident along the dermo-epidermal junction and superficial dermis (Figure II). These basaloid folliculolymphoid hyperplastic islands were found diffusely throughout Stage II on both peripheral and deep margins (Figure III). Thought to be an incidental finding in the setting of sezary syndrome, the wound was closed. There was no recurrence of basal cell carcinoma at the 6 month follow up.

CONCLUSION: Discussion: CTCL with histologic changes of basaloid folliculolymphoid hyperplasia resembling nodular basal cell carcinoma is a rare presentation reported only three times in the literature and not yet in the setting of sezary syndrome. Clinically, follicular CTCL often presents as follicular-based papules, small cystic lesions, or comedones. Our patient had long standing history of erythroderma but no reports of follicular-based lesions. Skin biopsies never showed these distinctive features, which perhaps is only evident on larger sampling as with that of a MMS stage. We postulate that basaloid folliculolymphoid hyperplasia is a secondary change in sezary syndrome without distinctive clinical features and such findings may be incidental and confused with basal cell carcinomas in frozen sections for Mohs Micrographic Surgery.

Figure 1. Mohs Frozen section – Stage I: Box indicates magnified area on Figure 2.

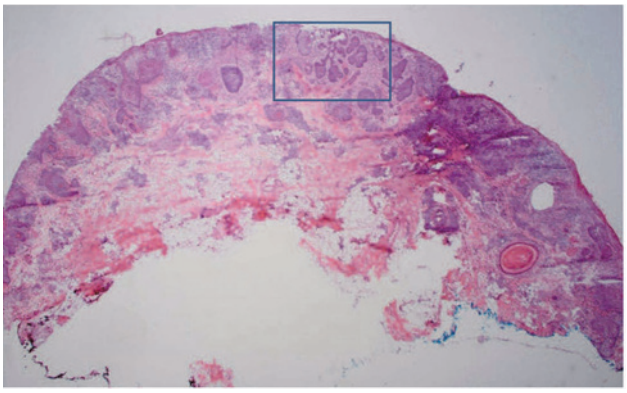


Figure 2. Mohs Frozen Section – Stage I, Magnified: Bizarre basaloid hyperplasia associated with hair follicles without retraction artifact with dense lymphocytic infiltrate showing epiderma- and pilo-trophism.

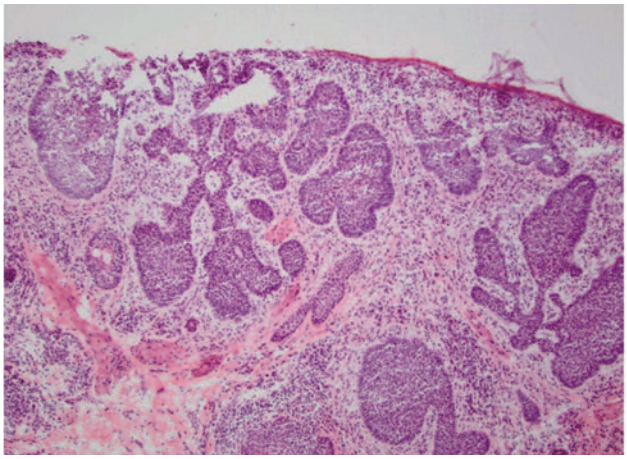
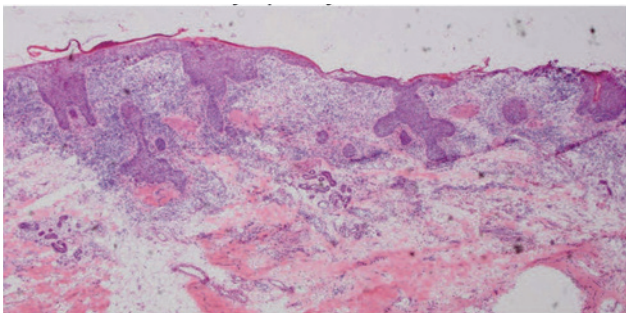


Figure 3. Mohs Frozen Section – Stage II: Bizarre basaloid hyperplasia associated with hair follicles without retraction artifact with dense lymphocytic infiltration.



040

TITLE: Wound Infection Rates Associated with Mohs Micrographic Surgery for Squamous Cell Carcinoma with Aggressive Subclinical Extension in Immunocompromised Smokers

AUTHORS: *Alina Goldenberg, BA[1]; Arisa Ortiz, MD[1]; S. Brian Jiang, MD[1]*

INSTITUTION: 1. University of California, San Diego, Department of Dermatology, La Jolla, CA, United States

PURPOSE: Wound infection rates in dermatologic surgery procedures are believed to be low. However, certain patient characteristics, including tobacco use and immunosuppression, may increase risk for post-operative complications including infection. Immunosuppression not only fundamentally limits the ability to fight infection, but is a known risk factor for squamous cell carcinoma (SCC). Immunosuppressed patients tend to develop more aggressive carcinomas, thus have larger post-operative defect sizes, longer procedure durations and a higher risk of infection. A particular challenge is SCC with aggressive subclinical extension (ASE); these lesions are more extensive than how they appear on clinical examination. They often require multiple stages of Mohs micrographic surgery (MMS), add to procedure lengths and further increase the risk of infection. The purpose of this study was to evaluate the post-procedure infection rates associated with MMS for SCC with ASE among immunosuppressed smokers compared to healthy patients.

SUMMARY: In the 5 years evaluated, we identified one thousand and five cases of SCC treated with MMS. Three hundred and two of them had ASE. Thirty-four percent of the cases were in immunosuppressed patients and 46% in smokers. Fifty-five patients (18%) were both immunosuppressed and cigarette users (SI group). Two percent of all cases and 11% of SI patients were found to have a post-operative infection. All of the patients with an infection were in the SI group. Patients in the SI group were younger than the healthy patients (p=<0.0001). The preoperative sizes of the lesions in the SI group were larger compared to healthy patients (p<0.0001). The majority of the infected lesions were repaired with a graft.

DESIGN: We performed a retrospective cross-sectional chart review of all MMS cases with a biopsy-confirmed diagnosis of SCC (including SCC in situ) identified to have ASE, presenting between March 2007 and February 2012. ASE was defined as any tumor requiring at least 3 MMS stages and a final surgical margin of at least 1 centimeter. Immunocompromised state was defined as a participant having an organ transplant, chronic immunosuppressive therapy use, or having a diagnosis of leukemia, lymphoma or HIV. Cigarette use during or within 6 months of MMS was included. Infection rates were assessed within 1 week following MMS.

CONCLUSION: Younger patients with large defects and graft repairs may be at a higher risk of post-operative infections despite post-procedure antibiotic prophylaxis. Immunosuppressed smokers may have a predilection for infections due to poor wound healing and inherent inability to fight off common pathogens. A limitation to our study is a small sample; we plan to conduct a large-scale study to further elucidate these preliminary findings.

Table 1. Demographics

	Cases, n=302, %	Smokers and Immunosuppressed (SI), n=55	Healthy, non-smokers, n=247
Sex			
Male	233 (77)	53 (96)	180 (73)
Female	69 (23)	2 (4)	67 (27)
Skin type 1/2/3/4/unknown	42/213/18/2/27	2/51/2	40/170/3/2/19
Age, years (mean, median, range)	68/69/38-96	61/59/38-81	70/71/38-96
Immunosuppressed	103 (34)	55 (100)	0
Cigarette use	139 (46)	55 (100)	0
Location			
Zone 1[a]	139	18	102
Zone 2[b]	139	26	114
Zone 3[c]	24	11	31
Preoperative size mm² (mean/median /range)	162/132/4-1591	257/156/35-1400	142/100/4-1591
Repair type			
CLC	76 (25)	16 (29)	60 (24)
Graft	91 (32)	21 (38)	69 (28)
Flap	120 (40)	16 (29)	105 (43)
Plastics	15 (5)	2 (4)	13 (5)
Antibiotic prophylaxis	6	1	5
Post procedure antibiotics	113 (37)	23 (42)(100)[d]	90 (36)
Infection	6 (2)	6 (11)	0
Post infection antibiotics	5	5	0
Pacemaker	20	0	20
Joint replacement	11	0	11
Artificial valve	12	0	12

[a] NCCN Guidelines Version 1.2013 of Squamous cell skin cancers: "mask areas" of face (central elids, eyebrows, periorbital nose, lips (cutaneous and vermillion), chin, mandible, preauricular and stauricular skin/sulci, temple, ear), genitalia, hands, and feet

[b] NCCN Guidelines Version 1.2013 of Squamous cell skin cancers: cheeks, forehead, scalp, neck etibial

[c] NCCN Guidelines Version 1.2013 of Squamous cell skin cancers: trunk and extremities exclud etibial, hands, feet, nail units, and ankles

[d] 100%: All of the patients with a post-procedure infection received prophylactic post-procedu tibiotics

041

TITLE: Same-day Erbium: YAG Laser Resurfacing to Improve Second Intention Healing after Mohs Micrographic Surgery on the Nose and Forehead

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INSTITUTIONS: 1. Washington University, Department of Dermatology, St. Louis, MO, United States 2. Washington University, Center for Dermatologic and Cosmetic Surgery, St. Louis, MO, United States

PURPOSE: This study examines the effectiveness of same-day resurfacing with the Erbium:YAG (Er:YAG) laser to improve wound healing by second intention after Mohs micrographic surgery (MMS) on the nose and forehead. The disadvantages of second intention healing on convex areas such as the nose and forehead include less predictable scar formation and depression of scars. Use of the Er:YAG laser to superficially ablate and feather the surrounding borders of surgical defects helps reduce scar depression. It may also be helpful for blending the contrast of scar and normal tissue when defects approach or cross cosmetic subunit boundary lines. In 2001, Ammirati et al. reported efficacy of immediate post-operative resurfacing with various ablative lasers. Mild hypopigmentation was noted and was most frequently associated with earlier, less selective carbon dioxide lasers. Our study advances this field by describing the consistent use of the Er:YAG ablative laser to treat 62 patients. Cosmetic outcomes have been measured in 52 patients with digital post-operative photographs using a modified Stony Brook Scar Evaluation Scale. This evaluated for scar height, color, texture, symmetry, and overall appearance.

SUMMARY: Immediate resurfacing with the Er:YAG laser after MMS on the nose and forehead produces satisfactory cosmetic outcomes and overall patient satisfaction. Post-operative follow-up times ranged from 1 to 80 weeks, with a median of 4 weeks and mean of 6 weeks. The overall modified Stony Brook Scar Evaluation score was 4.46 out of 5. There were very few side effects observed and immediate hypopigmentation was mild with Er:YAG laser resurfacing. One case of chondrodermatitis nodularis nasi developed after Er:YAG laser resurfacing.

DESIGN: This retrospective study identified 62 patients from 2008 to 2013 who underwent MMS for squamous cell carcinoma or basal cell carcinoma on the nose or forehead and had same-day Er:YAG laser resurfacing of the edge of their surgical wound to augment second intention healing. Sixty-one lesions were located on the nose and 1 lesion was located on the forehead. Post-operative digital photographs were available for 52 patients with high enough quality to evaluate cosmetic outcomes using a modified Stony Brook Scar Evaluation Scale. This scale was designed to evaluate laceration repairs so modification was required to include evaluation for scar height, color, texture, symmetry, and overall appearance. Scores were determined and averaged from two evaluating dermatologists who were not the primary surgeons on each case. Chart reviews were done to evaluate post-operative complications and assess overall patient satisfaction by documenting the need for scar revision.

CONCLUSION: Same-day resurfacing with the Erbium:YAG laser is an effective technique for improving wound healing by second intention after MMS on convex areas of the nose and forehead.

Figure 1. Post-op

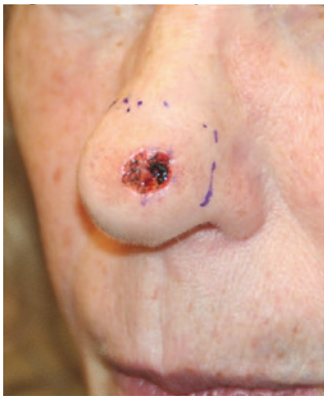


Figure 2. 8-days

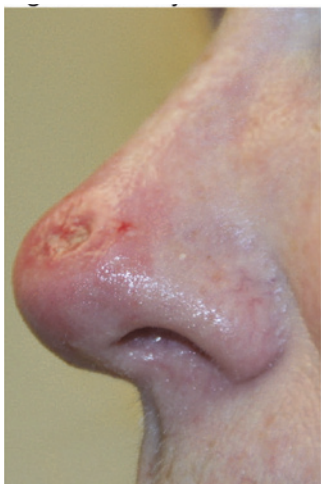
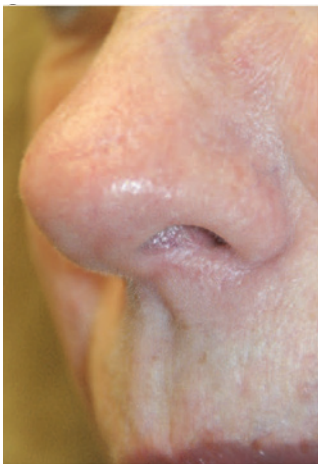


Figure 3. 1 Month



042

TITLE: Dermoscopy for Non-surgical Post-treatment Follow-up of Bowen's Disease

AUTHORS: *Shih-Tsung Cheng, MD[1]; Yi-huey Cheng, Senior Medical Student[2]; Stephen C-S Hu, MD[1]; Chiao-Li K. Ke, MD[3]*

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PURPOSE: Bowen's disease has the potential to develop into invasive squamous cell carcinoma if not adequately treated. Previously, it had been shown that the dermoscopic features of Bowen's disease are characterized by glomerular vessels and scaly surface. However, few studies have investigated the use of dermoscopy for non-surgical post-treatment follow-up of Bowen's disease. We seek to evaluate the usefulness of

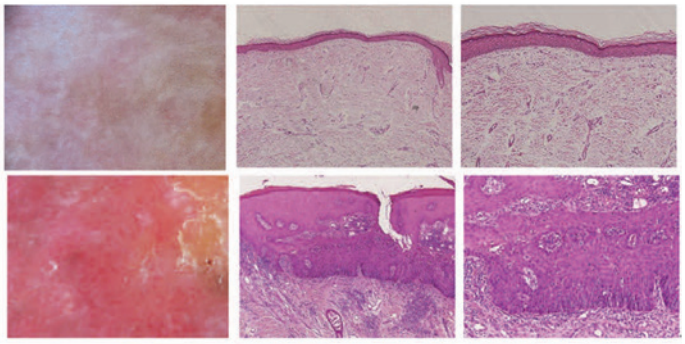
dermoscopy in the post-treatment follow-up of Bowen's disease.

SUMMARY: A total of 20 patients with 28 Bowen's disease lesions were included in this study. Following treatment, dermoscopic examination revealed the disappearance of pre-existing vascular structures in 19 lesions, and remaining vascular structures in 9 lesions. Histopathological evaluation of the treated lesions showed replacement with normal epidermis in 10 out of 12 lesions with disappearance of dermoscopic vascular structures (sensitivity 83 %), and residual Bowen's disease in 9 out of 11 lesions with persistent dermoscopic vascular structures (sensitivity 82 %).

DESIGN: Dermoscopic examination was performed on a series of patients with histologically confirmed Bowen's disease before and after various non-surgical treatment modalities (including liquid nitrogen therapy, 5% imiquimod cream, carbon dioxide laser ablation). Skin biopsies were taken from selected regions of the tumor to correlate changes in dermoscopic features and histopathological findings.

CONCLUSION: Dermoscopy is a useful and highly sensitive non-surgical post-treatment follow-up tool for Bowen's disease. The disappearance of vascular structures on dermoscopy is associated with disease cure, while the persistence of vascular structures indicates residual disease.

Figure 1. In lesions with disappearance of vascular structures, repeat skin biopsies revealed complete replacement of previous Bowen's disease by a normal epidermis and decreased dermal vascularity. In areas with persistence of vascular structures, repeat skin biopsies showed residual Bowen's disease and persistent increased dermal vascularity.



043

TITLE: **Take the Sutures Out: An Essential Salvage Maneuver for Flaps with Venous Congestion**

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PURPOSE: Venous congestion during flap creation and/or placement is a worrisome sign that may presage flap necrosis. Venous congestion is defined as dilation of veins and capillaries secondary to venous outflow obstruction. This leads to the telltale clinical signs of dark purple skin color and brisk capillary refill. If left unchecked, the flap is likely to become increasingly distended and develop arterial ischemia and total flap necrosis as the obstruction backs up to the arterial side. Thus, successful management of venous congestion hinges on immediate recognition, followed by execution of appropriate operative maneuvers to promote venous drainage. Often, partial or total flap salvage can be achieved.

DESIGN: The clinical pearl for successful management of venous obstruction during flap placement is immediate removal of all deep and superficial sutures. In a flap that is already compromised, this maneuver in many cases will relieve venous outflow obstruction. Additional useful steps include the following: give the flap fifteen to twenty minutes after suture removal to accommodate; place a warm saline-soaked gauze on the flap, which may improve flap circulation; finally, add one or two simple interrupted fixation sutures to position the flap. Leave the rest of the sutures out. To illustrate the usefulness of immediate intervention for venous flap congestion, we present one of three clinical cases in which suture removal proved successful. After Mohs surgery to clear tumor from the ala of a 55 year-old man, a melolabial flap was planned for reconstruction. After the flap was cut and transposed, signs of venous congestion were visualized, including purple skin color change and brisk capillary refill (Figure-1). Upon suturing the flap into place, the skin changes worsened. A diagnosis of flap-threatening venous congestion was made and all the sutures were promptly removed. The flap was warmed with warm saline gauze. A pink color returned to the base of the flap; the venous obstruction appeared improved. The distal tip still retained mild purple skin changes. A few interrupted skin sutures were placed to position the flap, which did not result in any further flap compromise (Figure-2). The rest of the sutures were left out. The patient was re-examined multiple times in the initial post-operative period. The patient was instructed to place a daily occlusive dressing with ointment. By day 10, the flap had developed mild superficial necrosis at the tip. The majority of the flap, however, was successfully salvaged (Figure-3). With a minor revisional surgery at the flap base only to remove a standing cone, the patient ultimately achieved an excellent aesthetic outcome.

CONCLUSION: Prompt recognition and diagnosis of venous congestion during flap placement, followed by the immediate removal of sutures is a clinical pearl that can result in successful flap salvage.

Figure 1. After transposition, the melolabial flap demonstrated purple skin color changes and brisk capillary refill consistent with venous congestion.

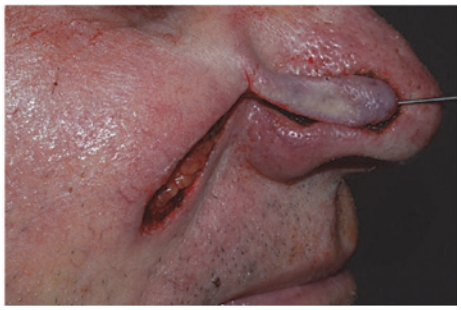


Figure 2. Flap appearance after deep and running suture removal. Base of the flap is pink, healthy, and without congestion. Note that the purple skin changes continue at the flap tip.

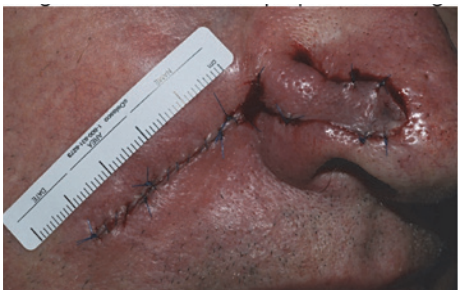
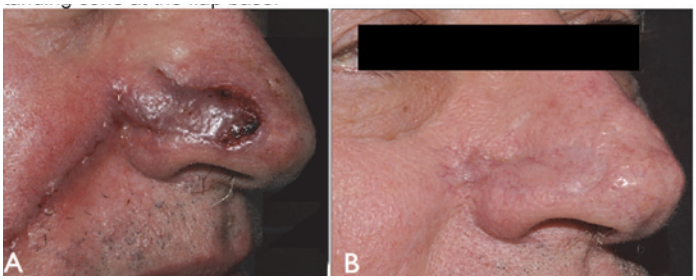


Figure 3. A. Post-operative day 10. The distal flap tip has undergone superficial necrosis. The rest of the flap has been salvaged. B. 8 month post-operative follow up. The tip of the flap healed with daily dressing changes without further surgical intervention. The patient ultimately obtained an excellent result after revisional surgery to remove a standing cone at the flap base.



044

TITLE: Primary Cutaneous Adenosquamous Carcinoma Mimicking Mucoepidermoid Carcinoma

AUTHORS: *Anthony V. Benedetto, DO[1,2]; Abhishek Aphale, MD[1]*

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PURPOSE: This report augments the available knowledge regarding primary cutaneous adenosquamous carcinoma and supports the use of Mohs micrographic surgery for its treatment.

DESIGN: Presented here is a case of a 71 year old man with a 2.3 centimeter crusted, keratotic, friable nodule that had been growing over five months. The initial biopsy was interpreted as mucoepidermoid carcinoma. Upon subsequent examination it was concluded to be adenosquamous carcinoma. There were atypical squamous cells in the epidermis and dermis showing an infiltrating pattern and pseudogland formation. Foci of cells were positive for CK7, CEA and EMA. P63 was positive indicating a primary cutaneous lesion. The lesion was excised completely using Mohs micrographic technique. The patient is being, and will be, followed closely with regular comprehensive physical examinations and review of systems; no evidence for recurrence or metastasis has been encountered over this 4-month period.

CONCLUSION: Adenosquamous carcinoma is thought to arise from the acrosyringium and is characterized by an invasive squamous cell carcinoma component in conjunction with a component of adenocarcinoma with malignant cuboidal or columnar epithelial cells forming glandular structures. There is usually strong CEA and CK7 positivity within the mucinous cells. Some consider it analogous to mucoedpidermoid carcinoma or squamous cell carcinoma with mucinous metaplasia. However, there is growing evidence that these are likely separate entities. Mucoepidermoid carcinoma is a malignancy of salivary glands with dermal collections of mucous-secreting cells, epidermoid cells and intermediate-type basaloid cells. It does not contain an intraepidermal component. The malignant cells are positive for CK7, CEA and EMA. Squamous cell carcinoma with mucinous metaplasia is characterized by atypical squamous cells in the epidermis invading into the dermis with focal areas of cells with intracellular mucin resembling, but not forming, glandular structures. In the few available reports, the malignant cells were negative for CK7, CEA and EMA. An important reason to distinguish between these entities is that they exhibit distinct behaviors. Since there is such a paucity of reports of squamous cell carcinoma with mucinous metaplasia, it is difficult to make a generalizable statement regarding its behavior; however, in the available reports, the lesions were excised using wide local excision with no recurrence or metastasis up to one year thereafter. Mucoepidermoid carcinoma is considered to be less aggressive than primary cutaneous adenosquamous carcinoma; however, the finding of mucoepidermoid carcinoma in the skin ought to raise suspicion of a metastasis from a tumor originating in the salivary glands. The reported incidence of metastasis for mucoepidermoid carcinoma is 2% for low-grade, 16% for medium-grade and 35% for high-grade tumors. While the reported incidence of metastasis of primary cutaneous adenosquamous carcinoma is 50%. Successful treatment of adenosquamous carcinoma has been demonstrated with wide local excision and with Mohs micrographic surgery.

045

TITLE: Use of Nasalis Hinge Flap and Full Thickness Skin Graft for Reconstruction of Partial Thickness Nasal Supratip and Tip Wounds

AUTHORS: *Eleanor Higgins, MB, BCh, BAO, MRCPI[1]; Rupert Barry, MD, MRCPI[1]*

INSTITUTION: 1. St. James' Hospital, Department of Dermatology, Dublin, Ireland

PURPOSE: Reconstruction of deep partial thickness wounds of the nasal supratip/tip can be challenging. Restoration of the appropriate converse contour is crucial to a successful reconstruction. Suboptimal reconstruction may result in an inappropriate concave contour which may be unsightly. Distal nasal defects may be repaired with a variety of local cutaneous flaps. These can involve extensive surgical procedures (including interpolated flaps) which may not be indicated or tolerated in an elderly population. The combination of a nasalis hinge flap and an overlying full thickness skin graft (FTSG) is a simple, reliable and reproducible one-stage reconstructive option for the repair of deep partial thickness wounds of the distal nasal region. We present a case series of patients to illustrate the technique and to highlight its merits.

DESIGN: We present a series of patients with partial-thickness wounds of the nasal supratip and nasal tip following Mohs surgery (Figure 1), repaired with a nasalis hinge flap and full thickness skin graft. A linear incision is made along the nasal dorsum/ sidewall junction over the proposed nasalis hinge flap. An appropriately sized hinge flap is then developed by incising down to the supraperichondrial plane (Figure 2). The flap is triangular in shape with its apex positioned superiorly. The muscular flap is elevated to within 3-4mm of its base. It is the folded over itself to fill the adjacent surgical defect. The flap is sutured into place with a rapidly absorbable 4-0 polyglactin 910 suture. A FTSG is immediately placed onto the folded nasalis hinge flap and secured with a rapidly absorbable 6-0 polyglactin 910 suture. A double layer non-adhesive foam bolster dressing is then used to secure the graft in place. The donor area of the nasalis hinge flap is closed in a primary layered manner. Both bolster and donor surface non-absorbable sutures are removed one week post-operatively.

CONCLUSION: The muscular nasalis hinge flap facilitates restoration of the natural convex contour of the distal nose. This permits immediate usage of a full thickness skin graft for cutaneous coverage which enables a simpler reconstruction. The site of the linear incision results in a scar which matures well and is discrete at the border of a cosmetic subunit. We have used this repair in a number of patients with a good cosmetic outcome and minimal patient morbidity. The combination of a muscular nasalis hinge flap and full thickness skin graft provides a simple, effective, single stage repair option to recreate the contour defect in deep partial thickness defects of the nasal tip and supra-tip.

Figure 1.

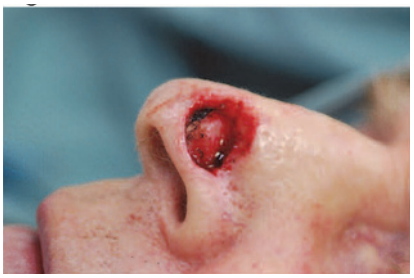
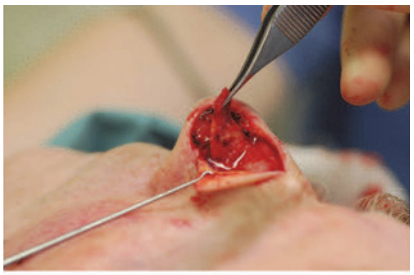


Figure 2.



046

TITLE: Informed Consent, Use, and Storage of Digital Photography among Mohs Surgeons and Academic Dermatologists in the US

AUTHORS: *Michael D. Sarradet, MD[1]; Sasha Jenkins, MD, MPH[1]; Benjamin Stoff, MD[1]; Laura DeLong, MD, MPH[1]; Jane Grant-Kels, MD[2]; Virginia A. Moye, BS[3]*

INSTITUTIONS: 1. Emory University School of Medicine, Department of Dermatology, Atlanta, GA, United States 2. University of Connecticut Health Center, Farmington, CT, United States 3. UNC Chapel Hill School of Medicine, Chapel Hill, NC, United States

PURPOSE: Digital photography is pervasive in dermatology. Potential uses include monitoring untreated disease and disease progression, monitoring treatment response, evaluating medical and cosmetic treatment, determining surgical sites, educating trainees and colleagues, and publishing reports in scientific journals. However, the nature of use, storage, and informed consent practices for digital photography among dermatologic surgeons has not been investigated. This study utilized a comprehensive, validated survey to elucidate these elements in order to better define standard practice.

SUMMARY: Overall response rate was 18% (32% response rate from APD and 17% from ACMS). 34% were members of the APD, 53% were members of the ACMS, and 14% were members of both groups. The majority of respondents were either in an academic setting (51%) or at a private group practice (50%), and were procedural dermatologists, including Mohs surgeons (61%). The respondents were broadly representative of the range of duration in practice and region of the country. All but one respondent used photography in practice. Of users, all employed

photography for patient care, 77% for education, 62% for publication and <37% for research and/or informal consults. Photographs were mostly taken on designated work-only cameras (89%), although 14% used personal cameras and 30% Smartphones. Only 37% of responders utilized a password protected phone. All but 4% pursued some form of consent before taking photographs, with 16% using verbal consent and 80% using written consent (Figure 1). If using written consent, the majority (94%) explained what the photograph would be used for. Photographs are stored on a variety of devices: ranging from personal cell phones (6%) to patients' chart (50%) to personal computers (20%) (Figure 2). However, 96% of respondents believed photographs should be a part of the medical record. There were diverse responses to what makes a photograph de-identified (Figure 3). Although 35% use black bars to cover patient's eyes, most felt that this did not conceal a patient's identity (66%).

DESIGN: An email with the survey link was sent to all members of American College of Mohs Surgery (ACMS) and Association of Professors of Dermatology (APD) three times. A total of 238 responses were collected so far. A follow-up email reminder will be sent to increase the response rate. CONCLUSION: All but one respondent of this survey uses photography in his/her practice, and the majority utilizes written consent. However, most varied in type of storage and opinion about what makes a photograph identifiable. Based on these findings, ACMS may consider generating a consensus statement on appropriate use of digital photography in dermatology practice.

CONCLUSION: All but one respondent of this survey uses photography in his/her practice, and the majority utilizes written consent. However, most varied in type of storage and opinion about what makes a photograph identifiable. Based on these findings, ACMS may consider generating a consensus statement on appropriate use of digital photography in dermatology practice.

Figure 1. Q13 – What method of consent, if any, is used for taking photographs in your office? Answered: 225; Skipped: 17

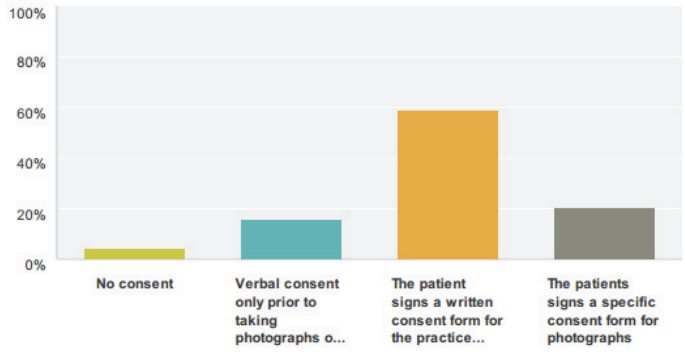


Figure 2. Q15 – Where are patient photographs taken by you or someone you supervise stored? Check all that apply. Answered: 210; Skipped: 32

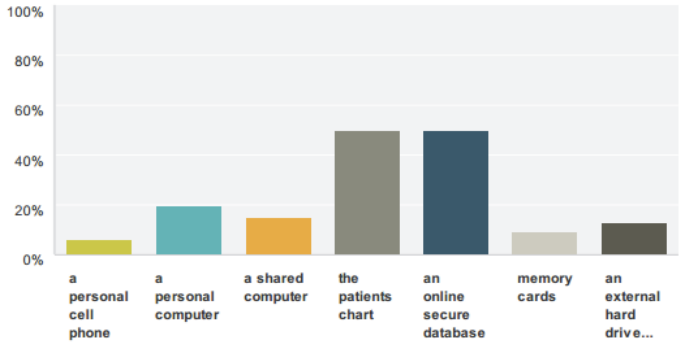
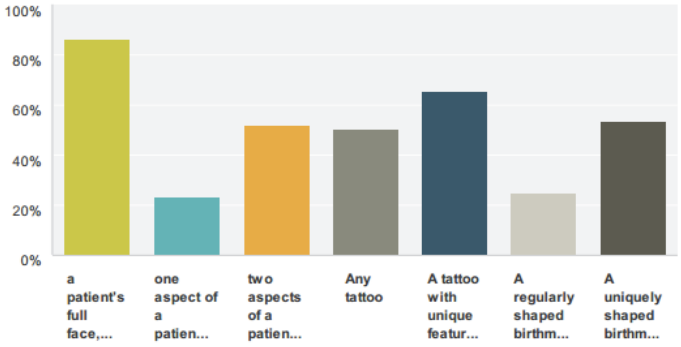


Figure 3. Q18 – In your opinion, what makes a photograph identifiable? Check all that apply. Answered: 217; Skipped: 25



047

TITLE: A Therapeutic Approach to Invasive and In-situ Squamous Cell Carcinomas arising in a Patient with Hydroxyurea-associated Non-melanoma Skin Cancers

AUTHORS: *Emily F. Stamell, MD[1]; Joshua Berger, MD[1]; Ryan B. Turner, MD[1]*

INSTITUTION: 1. Albert Einstein College of Medicine, Division of Dermatology, New York, NY, United States

PURPOSE: Hydroxyurea-associated nonmelanoma skin cancers (HU-NMSC) are well-documented side effects of chronic hydroxyurea therapy. These skin cancers are typically aggressive and often require a multimodal treatment approach.

SUMMARY: We describe a 68-year-old male with a history of essential thrombocythemia on chronic hydroxyurea therapy who presented with an invasive squamous cell carcinomas (SCC) of the hands arising in a background of dermatomyositis-like changes also secondary to hydroxyurea (Image A). Additional biopsies of non-contiguous dermatomyositis-like changes on the hands revealed histological alterations consistent with SCC in situ (SCCIS). The patient underwent Mohs Micrographic Surgery for the invasive SCC (Image B) followed by radiotherapy (Image C). The in situ cancers were treated with topical imiquimod. Hydroxyurea therapy was continued due

to the severity of the patient's underlying essential thrombocythemia. Despite improvement of the SCC's on the hands, the patient went on to develop an SCC of the rectum.

DESIGN: Management of HU-NMSC represents a therapeutic conundrum. Discontinuation of hydroxyurea not only facilitates improved treatment efficacy of the HU-NMSC, but also limits development of new skin caners. However, cessation of therapy is not always an option, as was the case in our patient. As such, HU-NMSC often requires a multimodal approach. There have been a number of therapies reported in the literature, including topical immunomodulators, radiation therapy, photodynamic therapy, surgical excision, and Mohs micrographic surgery. Chemoprevention with retinoids is an adjuvant therapeutic option for patients continued on the hydroxyurea.

CONCLUSION: It is prudent to closely monitor patients on hydroxyurea with or without a history of HU-NMSC given the aggressive nature of the skin cancers.

Image A.

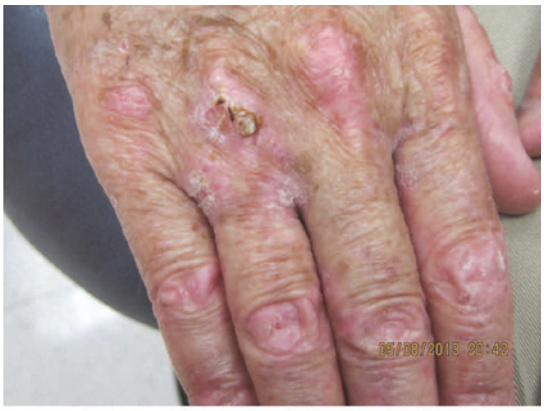


Image B.

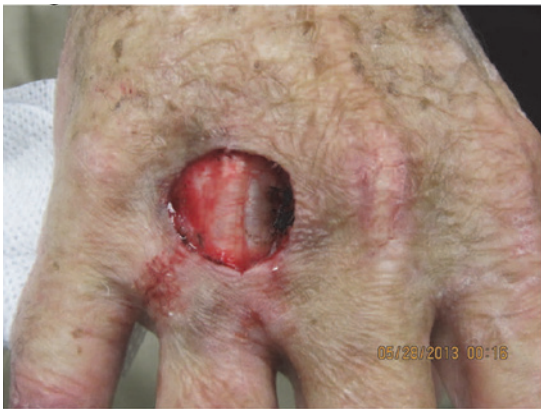
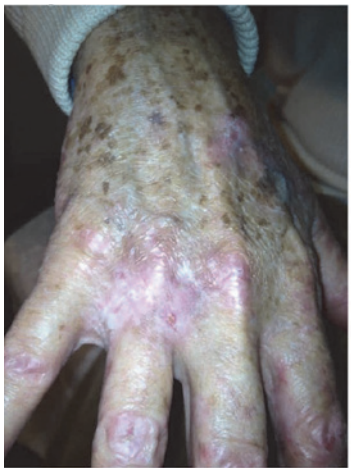


Image C.



048

TITLE: Vismodegib Resistance after Successful Treatment of Basal Carcinomas in Gorlin Syndrome

AUTHORS: *Renato Goreshi, MD[1,2]; Jorge Toro, MD[2]; Wen Chen, MD[3]; Annyce Treherne, MD[4]*

INSTITUTIONS: 1. Howard University Hospital, Department of Dermatology, Washington, DC, United States 2. Washington DC VA Medical Center, Department of Dermatology, Washington, DC, United States 3. Washington DC VA Medical Center, Department of Pathology, Washington, DC, United States 4. Treherne Dermatology & Skin Care Center, Hampton, VA, United States

PURPOSE: The following case presents the use of vismodegib on a patient with Gorlin's Syndrome and presents a possible case of vismodegib resistance. There have been no cases of such resistance in Gorlin's Syndrome to the author's knowledge.

SUMMARY: The patient is a 52-year-old Caucasian man who initially presented to the dermatology clinic with a history of basal cell nevus syndrome (BCNS) with a lesion on the scalp. Biopsy of the scalp lesion had shown cystic basal cell carcinoma (BCC). The patient has a history of multiple BCCs with the first BCC appearing on near the right lateral canthus at age 19. Genetic testing of peripheral blood indicated heterozygosity for a duplication of exon 3 of the PTCH 1 gene confirming the diagnosis of BCNS. He has been treated previously with standard excision, Mohs micrographic surgery (MMS), 5-aminolevulinic acid photodynamic therapy, imiquimod, cryotherapy, and ED&C which provided temporary relief followed with the development of numerous new lesions. The patient was started on vismodegib 150 mg once daily. Three months after starting therapy with vismodegib there was significant reduction in size and number of clinically diagnosed BCCs and clearance of palmoplantar pits. He experienced mild frontotemporal scalp and eyebrow alopecia and muscle tenderness. After 16 months of successful therapy with no BCCs, examination revealed approximately

ten erythematous, slightly elevated, 2-3 mm papules on the torso and lower extremities. Three skin biopsies were performed, confirming BCC, superficial type. The patient is currently awaiting further management.

CONCLUSION: Gorlin syndrome, or BCNS is an autosomal dominant, rare genetic syndrome characterized by multiple basal cell carcinomas, jaw cysts, palmar and plantar pits, skeletal abnormalities and other developmental defects. The most commonly etiologic gene mutation involved in pathogenesis is the PTCH1 gene, but other genes such as the PTCH2, Smoothened (SMO), and Sonic Hedgehog (SHH) have also been observed in BCNS. First-line therapy for BCCs is currently surgical removal, but when there is either locally advanced disease or, as in the described case, numerous BCCs are present other options must be considered. Vismodegib is an oral inhibitor of the Smoothened/Hedgehog pathway, FDA-approved for locally advanced or metastatic BCC. We describe a patient who, after 16 months of successful treatment with vismodegib, developed possible resistance to the medication. A possible pathophysiologic etiology includes PIK3c (phosphatidylinositol 3-kinase catalytic) interference with Smoothened antagonists such as vismodegib, which has been observed in patient with medulloblastoma. Nevertheless, vismodegib provides a promising therapeutic modality for patient with Gorlin Syndrome. Further studies are needed to explore possible vismodegib resistance after continued use and vismodegib's role as a neoadjuvant with other treatments such as imiquimod or photodynamic therapy.

049

TITLE: Multiple Keratoacanthomas Presenting as Prurigo Nodularis in Chronic Lichenified Dermatitis

AUTHORS: *Eric C. Wilkerson, MD[1]; Jeremy Davis, MD[1]; W. Elliot Love, DO[1]*

INSTITUTION: 1. Case Western Reserve University, MetroHealth Medical Center, Department of Dermatology, Cleveland, OH, United States

PURPOSE: Reported is a case of a 53-year-old Nepali woman with a five-year history of an intermittent, generalized, pruritic, and erythrodermic eruption consisting of large, lichenified, scaling plaques and numerous firm papules and nodules. Biopsies of the generalized eruption have shown spongiotic and cytotoxic dermatitis and lichen simplex chronicus. Biopsies of the papules and nodules have shown prurigo nodules and keratoacanthomas, many of which have resolved without treatment, consistent with the typical course of a keratoacanthoma. The patient's clinical presentation is consistent with a syndrome of eruptive keratoacanthomas of various sizes and forms resembling the Witten-Zak subtype and arising in the setting of chronic pruritus, lichenified dermatitis, and prurigo nodularis. Several reported cases of multiple keratoacanthoma syndromes have demonstrated successful treatment with systemic retinoids such as etretinate and acitretin. Our patient is currently undergoing treatment with acitretin.

CONCLUSION: This case highlights the need for careful evaluation of patients with multiple prurigo nodules, with which eruptive keratoacanthomas can been associated.

Figure 1.

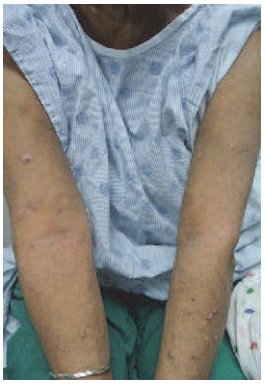


Figure 2.

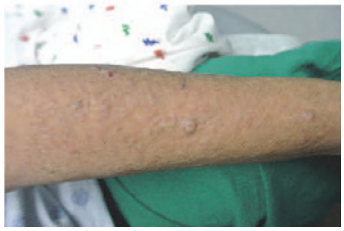
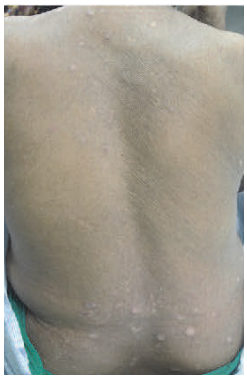


Figure 3.



050

TITLE: Characteristics of Large Basal Cell Carcinomas Removed with Mohs Micrographic Surgery: A 10 Year Experience

AUTHORS: *Anastasia Bassis, MD[1]; J. Ramsey Mellette, Jr., MD[1]; Mariah R. Brown, MD[1]*

INSTITUTION: 1. University of Colorado Health Center, Department of Dermatology, Aurora, CO, United States

PURPOSE: Since the advent of Mohs Micrographic Surgery, it has been observed that certain anatomic locations predispose to the growth of extremely large tumors. Larger tumors increase patient morbidity, procedure complexity, and health care cost, and may result in less optimal cosmetic outcomes. Recognizing patient and histological risk factors may guide screening recommendations and encourage expedited referral for surgical removal. Additionally, ascertaining histological or anatomic factors that predispose to large tumor growth may add to the understanding of tumor oncogenesis.

SUMMARY: Analysis of the 30 largest BCCs revealed that the lateral superior facial plane was the most common location for large BCC growth, with 37% (11/30) of tumors occurring in this area. Anatomically, this included the temple, lateral forehead, lateral eyebrow, superior pre-auricular and supra-auricular regions. The patients with tumors in the lateral superior facial plane were all Caucasian, and the majority were elderly males with an average age of 71 years (range 49-88). The average post-Mohs defect size in these tumors

was 70 cm2 (range 43-110). Most of the tumors showed a desmoplastic pattern of infiltration (9/11) that extended to the muscle or fascia (6/11). The average number of stages required to clear the tumors was 4.5, and the most common methods of repair involved grafting (7/11) and secondary intention healing (4/11).

DESIGN: In this IRB approved, retrospective chart review study, all Mohs cases performed in the past 10 years at a single academic center were reviewed. The 30 largest BCCs were identified (based on the post-operative size after the final stage of Mohs Surgery). The histopathology of all tumors was confirmed by review of cataloged frozen-section histology slides. All patients with a collision tumor or other tumor type besides BCC were excluded from the study. The medical charts of the included patients were subsequently reviewed to extract data on patient and procedure characteristics. A follow-up questionnaire is planned to collect data on surgical outcomes and recurrence rates.

CONCLUSION: This retrospective chart review of Mohs cases indicates that the majority of extremely large BCCs are seen in the temple area. The predisposition for large tumor growth on the lateral superior facial plane may be explained by growth over embryological fusion planes, variations in microanatomy, or several patient factors, including patient neglect due to difficulty in visualizing the location and increased lateral UV exposure through side windows of automobiles. This anatomic area should be considered a high risk location for growth of large, infiltrative BCCs.

Figure 1. Right Temple BCC

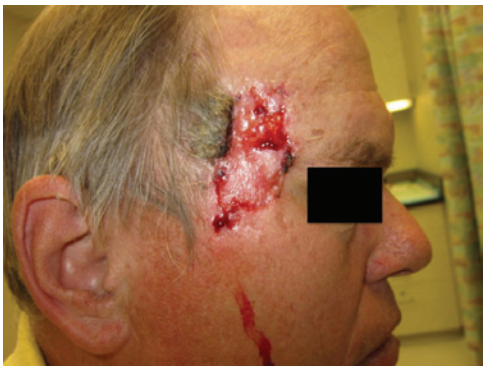
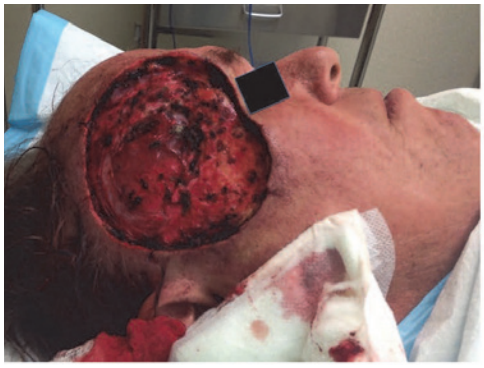


Figure 2. Post-Operative Defect



051

TITLE: Comparison of Full Thickness Skin Grafts versus Second Intention Healing for Mohs Defects of the Helix

AUTHORS: *Phillip C. Hochwalt, MD[1]; Kevin N. Christensen, MD[1]; Sean Cantwell, BS[1]; Christian L. Baum, MD[1]; Jerry D. Brewer, MD[1]; Christopher J. Arpey, MD[1]; Clark C. Otley, MD[1]; Randall K. Roenigk, MD[1]*

INSTITUTION: 1. Mayo Clinic, Department of Dermatology, Rochester, MN, United States

PURPOSE: There are many options for repairing Mohs surgical defects on the helix of the ear. However, there is limited long-term data regarding the cosmetic outcomes, patient satisfaction, and complication rates of these repairs. While flaps and wedge excisions are frequently considered the gold standard for maintaining contour of the helical rim, patients often prefer less involved repairs. Full thickness skin graft (FTSG) repairs for helix defects are considered by many surgeons to provide a good balance of cosmesis and relative simplicity. Conversely, second intention wound healing, the simplest possible repair, is often avoided due to the practitioner's perception of inferior cosmesis, lower patient satisfaction, and the potential for complications such as pain, chondritis, and bleeding. The purpose of this study is to compare outcomes of FTSG versus second intention wound healing for Mohs defects on the helix.

SUMMARY: In total, Mohs defects of the helix were left to heal by second intention in 29 patients and were repaired with a FTSG in 18 patients. Surgical defects and patient characteristics were not significantly different except for an increase in perioperative antibiotic use for FTSG patients (Figure 1). The average VAS score for the second intention group was 82.1 (SD of 7.6) and the average VAS score for the FTSG group was 75.2 (SD of 16.7) (difference of 6.9, 95% CI of -1.3 to 15.1, p value 0.061). A post-hoc analysis of non-inferiority was significant for a VAS difference as small as 2, indicating that the cosmetic outcome from second intention healing was at least as good as FTSG in our study. Retrospective chart analysis revealed no significant difference in complications (Figure 1). Patient reported outcomes were not significantly different (Figure 2).

DESIGN: A retrospective chart review was performed of patients who underwent Mohs surgery on the helix followed by repair with a FTSG or second intention wound healing. Inclusion criteria were as follows: defect size between 1.0 and 3.0cm, defect involving no or minimal cartilage, and a minimum of 6 months follow up. All patients had preoperative, intraoperative, and postoperative photographs. Cosmetic outcomes were assessed by 4 blinded Mohs surgeons utilizing the visual analogue scale (VAS). In addition, patient questionnaires and retrospective chart analysis were used to assess a variety of secondary outcomes including patient satisfaction, wound care difficulty, healing time, postoperative pain, and complications such as infection, graft necrosis, chondritis, and bleeding.

CONCLUSION: Mohs surgical defects left to heal by second intention have comparable long-term cosmetic outcomes to those repaired by FTSG. There was no significant difference in complications including infection and chondritis. Patients were highly satisfied with second intention healing outcomes despite a slightly longer, but not statistically significant, healing time. Second intention healing has the additional benefit of significant cost-saving.

Figure 1.

Characteristics of Patients / Mohs Defects			
	Second Intention (N=29)	FTSG (N=18)	p value
Gender			1.0000[1]
Female	1 (3.4%)	0 (0.0%)	
Male	28 (96.6%)	18 (100.0%)	
Age			0.1968[2]
Mean (SD)	72.6 (10.6)	67.9 (13.7)	
Range	(49.0-88.0)	(42.0-87.0)	
Follow-up (months) at time of photo			0.4256[2]
Mean (SD)	68.9 (28.3)	61.0 (39.2)	
Range	(19.0-122.0)	(6.0-119.0)	
Follow-up (months) at time of patient survey			0.4044[2]
Mean (SD)	81.7 (20.8)	87.7 (22.5)	
Range	(53.0-122.0)	(57.0-119.0)	
Smoking status			1.0000[1]
No	27 (93.1%)	16 (88.9%)	
Occasional	1 (3.4%)	1 (5.6%)	
Yes	1 (3.4%)	1 (5.6%)	
Alcohol			0.7863[1]
No	9 (31.0%)	8 (44.4%)	
Occasional	18 (62.1%)	9 (50.0%)	
Yes	2 (6.9%)	1 (5.6%)	
Hypertension			0.6274[3]
No	15 (51.7%)	8 (44.4%)	
Yes	14 (48.3%)	10 (55.6%)	
Diabetes			0.4548[3]
No	25 (86.2%)	14 (77.8%)	
Yes	4 (13.8%)	4 (22.2%)	
Antiplatelet or anticoagulant use			0.4063[1]
ASA	12 (41.4%)	8 (44.4%)	
ASA/dipyridamole	0 (0.0%)	1 (5.6%)	
Clopidogrel/ASA	2 (6.9%)	0 (0.0%)	
None	13 (44.8%)	6 (33.3%)	
Warfarin	2 (6.9%)	3 (16.7%)	
Antibiotics			0.0021[1]
None	19 (65.5%)	8 (44.4%)	
Post-Operative	0 (0.0%)	6 (33.3%)	
Pre-Operative	9 (31.0%)	2 (11.1%)	
Pre-Operative and Post-Operative	1 (3.4%)	2 (11.1%)	
Defect Size (cm)			0.0940[2]
Mean (SD)	1.7 (0.5)	1.9 (0.5)	
Range	(1.1-2.9)	(1.3-3.0)	
Depth			0.4858[1]
fat	22 (75.9%)	11 (61.1%)	
perichondrium	1 (3.4%)	1 (5.6%)	
focal cartilage	6 (20.7%)	6 (33.3%)	
Fitzpatrick skin type			0.8663[1]
I	3 (10.3%)	2 (11.1%)	
II	22 (75.9%)	15 (83.3%)	
III	4 (13.8%)	1 (5.6%)	
Donor Site			
conchal bowl	N/A	1 (5.6%)	
neck/supraclavicular	N/A	2 (11.1%)	
postauricular	N/A	8 (44.4%)	
preauricular	N/A	7 (38.9%)	
Glogau scale			
Advanced	3 (10.3%)	5 (27.8%)	0.2296[1]
Severe	26 (89.7%)	13 (72.2%)	
Complications (as reported in patient chart)			
No	27 (93.1%)	16 (88.9%)	0.6313[1]
Yes	2 (6.9%)	2 (11.1%)	
[1]Fisher Exact [2]Equal Variance T-Test [3]Chi-SSquare			

Figure 2.

Patient Reported Outcomes*				
	Second Intention (N=29)	FTSG (N=18)	Total (N=47)	p value
Complications				1.0000
No	22 (88.0%)	12 (85.7%)	34 (87.2%)	
Yes	3 (12.0%)	2 (14.3%)	5 (12.8%)	
Missing*	4 (.%)	4 (.%)	8	
Infection				
No	25 (100.0%)	14 (100.0%)	39 (100.0%)	
Missing*	4 (.%)	4 (.%)	8	
Bleeding				0.5277
No	23 (92.0%)	14 (100.0%)	37 (94.9%)	
Yes	2 (8.0%)	0 (0.0%)	2 (5.1%)	
Missing*	4 (.%)	4 (.%)	8	
Graft necrosis				
No	N/A	12 (85.7%)		
Yes	N/A	2 (14.3%)		
Missing*	N/A	4 (.%)		
Chondritis				
No	25 (100.0%)	14 (100.0%)	39 (100.0%)	
Missing*	4 (.%)	4 (.%)	8	
Pain severity (1-10)				0.6065
Mean (SD)	2.5 (1.8)	2.8 (1.6)	2.6 (1.7)	
Range	(1.0-8.5)	(1.0-5.0)	(1.0-8.5)	
Duration of pain (days)				0.2243
Mean (SD)	4.6 (6.5)	2.4 (2.1)	3.8 (5.4)	
Range	(1.0-28.0)	(1.0-7.0)	(1.0-28.0)	
Healing time (weeks)				0.7119
Mean (SD)	3.0 (1.6)	2.8 (1.0)	2.9 (1.4)	
Range	(1.0-6.0)	(1.0-5.0)	(1.0-6.0)	
Difficulty with care for site (1-10)				0.4845
Mean (SD)	3.0 (2.5)	2.3 (1.9)	2.7 (2.3)	
Range	(1.0-8.5)	(1.0-8.0)	(1.0-8.5)	
Cosmetic outcome (1-10)				0.0642
Mean (SD)	9.7 (0.7)	8.9 (1.9)	9.4 (1.3)	
Range	(7.0-10.0)	(5.0-10.0)	(5.0-10.0)	
Overall satisfaction (1-10)				0.1493
Mean (SD)	9.8 (0.5)	9.3 (1.1)	9.6 (0.8)	
Range	(8.0-10.0)	(7.0-10.0)	(7.0-10.0)	

*Four patients from each group did not complete patient questionnaires. However, no complications were identified in their chart review.

052

TITLE: **Double Island Pedicle Flap Repair for Combined Lip Defects**

AUTHORS: *Shyamala C. Huilgol, MBBS(Hons), FACD[1,2]; Joyce Ma, MBBS[1]; Russell J. Hills, MBBS, FACD[3]*

INSTITUTIONS: 1. University of Adelaide, Department of Dermatology, Adelaide, SA, Australia 2. Adelaide Skin & Eye Centre, Kent Town, SA, Australia 3. Aesthetix, Auchenflower, Qld, Australia

PURPOSE: Reconstruction of the lip is a challenge, particularly in fuller lips and where the vermilion border, Cupid's bow and philtral columns are well defined. Excision of skin cancer near the vermilion border often results in a combined cutaneous and vermilion defect, spanning this visually important border. A novel approach to the closure of these combined defects is described, using two island pedicle flaps, one each for the cutaneous and mucosal lip.

SUMMARY: Following institutional ethics board approval, a retrospective review of all patients with combined lip defects who underwent double island pedicle flap repair from June 2008 to July 2013 was performed. Nine patients (5 females; ages 35-89) had 7 upper lip defects and two lower lip defects. Defect sizes ranged from 9x13 to 15x35mm. Eight patients had two vertical flaps. Minor hypertrophic scarring in two patients was successfully treated with injected triamcinolone acetonide. There was one small postoperative bleed. There were no cases of vermilion border mismatch or flap necrosis. Follow-up was 3 months or longer with good or excellent outcomes in all cases. Vertical flaps on the upper lip permitted recreation of the Cupid's bow and the philtral columns.

DESIGN: Small to medium partial-thickness surgical defects of 10-25 mm, crossing the vermilion border on the upper or lower lip are suitable. The flaps are usually vertical, with triangles above and below the defect, but the cutaneous flap may be horizontally mobilized from the lateral lip. The flaps are incised down to the muscle layer and the edges undermined, together with the defect. The tail of mucosal flap extends almost to the gingival sulcus. Meticulous haemostasis is required. Key sutures pex the leading undersurface of the flaps to orbicularis oris at the base of the defect. Subsequent buried sutures realign the lateral edges of the flaps at the vermilion border then standard techniques with buried and superficial sutures are used to complete defect closure. Once both flaps are in position, trimming and suturing of the advancing edges recreates the shape of the vermilion junction, this may be a relatively straight line or mimic curves such as the Cupid's bow. At closure, the flaps should be slightly concave, to prevent trapdooring.

CONCLUSION: Using two island pedicle flaps for repair of combined lip defects obeys the principle of cosmetic subunit repair with separate flaps for the cutaneous and vermilion components. This repair permits retention of the entire natural width of the lip at the vermilion border. Furthermore, unlike standard lip wedge repairs, it permits recreation of the Cupid's bow and philtral columns.

053

TITLE: **Putting the Lid on Wound Contamination**

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PURPOSE: Post operative infections represent a small but real problem in dermatologic surgery, with the infection rate reported between less than 1% to over 4%. Staphylococcus aureus and less commonly streptococcus cause the majority of post-operative infections. Occasionally there is the surprising infection caused by organisms suggesting fecal contamination such as Escherichia coli, Enterobacter cloacae, Enterobacter aerogenes, Kelbsiella pneumonia, and Aeromonas hydrophila. Potential sources include hand contamination of the person performing the wound care and contamination during bathing. However, other sources of infection warrant consideration. Contamination of dressings or the wound from environmental bacteria represents one such source. Fecal material aerosolizes with toilet flushing. Dressing material stored or wound care performed in the bathroom could be contaminated. We explored where our patients performed wound care and where they stored their dressing materials.

SUMMARY: A majority of patients (67.5%) cleaned their wound in the bathroom. Additionally, 10.5% of the respondents indicated they cared for their wound in a bathroom and sat down while they were performing wound care (most likely on the only seat available in the room). The kitchen was the second most popular location to perform wound care, utilized by 21.3% of respondents. The availability of running water likely makes these two locations most popular. The bathroom and kitchen locations again dominated responses of where individuals keep their wound care supplies with 68.9% and 14.7% respectively.

DESIGN: 286 patients in our Mohs surgical unit were surveyed at their first postoperative visit about their wound care technique.

CONCLUSION: Greater than two thirds of our patients perform wound care and store their supplies in the bathroom. This practice may contribute to wound infections, particularly those caused by bacteria seen as fecal contaminants. While further study to link this practice to infection can be done, simply including instructions to do such care in other locations minimizes this potential exposure to contaminating bacteria. With a water supply for hand washing and potential storage for supplies, the kitchen seems the most suitable location for wound care.

054

TITLE: Pexing Sutures Combined with Secondary Intention Healing for Nasal Defects and Internal Nasal Valve Function Loss; a Novel Reconstructive Approach

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INSTITUTION: 1. Portsmouth Hospitals NHS Trust, St. Mary's Hospital, Hampshire, United Kingdom

PURPOSE: We describe a novel, successful and minimally invasive reconstructive technique for large, deep nasal side-wall defects associated with internal nasal valve (INV) function loss post Mohs' Micrographic Surgery (MMS).

SUMMARY: Large and deep nasal defects i.e. 20 mm x 20mm can be a challenge to repair anywhere on the nose particularly so on the lower nasal sidewall affecting the alar with INV function loss. The standard reconstructive approach to regain lost INV function and attain optimal cosmesis would be to use a cartilage baton graft with a staged forehead interpolation flap. With a rising elderly population and non- melanoma skin cancer increasingly prevalent the Mohs' surgeon frequently encounters patients with complex tumours requiring multiple stages of Mohs' surgery prior to achieving complete tumour clearance. In our experience patients often prefer a simple, minimally invasive and functionally effective repair option post MMS. Often patients both young and elderly poorly tolerate multi-staged large interpolation flaps due to further invasive surgery, longer procedure duration, inconvenience of regular dressing changes and post-operative bleeding.

DESIGN: We describe two patients aged 50 and 75 respectively with optimal performance status who underwent 4 stages of MMS respectively to the nasal sidewall with large defects extending down to the nasal mucosal lining and INV function loss lying at least 4 mm away from the nasal rim. Both patients were non- smokers and took no anticoagulants. They opted against cartilage grafting with staged interpolation flap repair in view of further invasive surgery. We used 4-0 polydiaxanone (PDS ®) as pexing suture and sutured the area of INV collapse to the deep intramuscular region of the cheek, which resolved the air inflow limitation. Another 4-0 PDS ® pexing suture was used to stabilise associated nasal rim instability and achieve symmetry of both nasal nares. The rest of the defect was left to heal by secondary intention for 4 weeks. A seaweed alginate dressing (Kaltostac®) was used to pack the defect with a pressure dressing and was changed twice in the first post-operative week. A hydrocolloid dressing (Granuflex®) was then used to enhance wound healing. Both defects completely healed with no functional deficit, high patient satisfaction and optimal cosmesis in 4 weeks with maintainance of these results 4 months postoperatively.

CONCLUSION: We describe the combination of pexing sutures and secondary intention healing for reconstructing large and deep nasal sidewall defects affecting the alar with INV function loss as a novel, effective and minimally invasive reconstructive technique in the appropriately selected patient.

Figure 1.

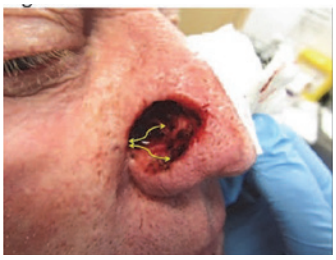
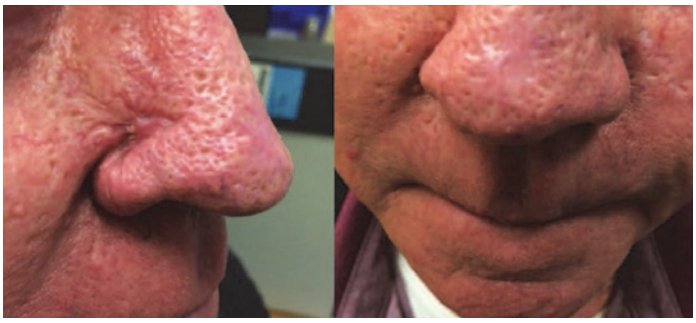


Figure 2.



055

TITLE: **5-mm Surgical Margins are Adequate for Non-lentiginous Melanoma In-situ**

AUTHORS: *Keith L. Duffy, MD[1]; Amanda Truong, BS[2]; Scott R. Florell, MD[3]; Anneli R. Bowen, MD[3]; David Wada, MD[3]; Glen M. Bowen, MD[1]; Douglas Grossman, MD, PhD[3]*

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PURPOSE: There has been some recent debate about appropriate surgical margins for melanoma in-situ. It is well known and documented in the surgical oncology and Mohs surgery literature that the lentigo maligna subtype of melanoma in-situ which occurs on chronically sun damaged skin with lentiginous features is frequently incompletely excised with 5-mm surgical margins. However, the appropriate margins for non-lentiginous melanoma in-situ has still not been well defined or rigorously studied. Based on our groups' clinical experience we hypothesized that 5 mm margins are indeed adequate in the majority of cases for for non-lentiginous melanoma in-situ.

SUMMARY: We reviewed all biopsies from our university and from our melanoma database from 1990-2010 with a dermatopathology report stating "melanoma in-situ." All cases of "lentigo maligna, melanoma in-situ" were excluded. Of an initial screen of 268 reports of "melanoma in-situ" only 76 cases met the criteria for inclusion. All biopsy material was reviewed by three board certified dermatopathologists. Of these 76 cases that were reviewed 40 were excluded because they represented lentigo maligna subtype melanoma in-situ and 4 were excluded because they were noted to have superficial invasion on re-review of the pathology. Thirty-two cases of confirmed non-lentiginous melanoma in-situ were ultimately included in the study. With a mean of 6.75 years (range 1.9 to 18.3 years) of clinical follow-up there were no recurrences noted and no deaths from malignant melanoma. Five patients are in the process of being contacted and will be included once successfully contacted and examined. Of the 32 cases examined 14 had evidence of a positive margin at the time of the biopsy. Only 4 of these specimens showed residual tumor in the excision specimen. None had positive margins on excision. The average histologic excisional margin (measured from residual melanoma in situ or edge of the scar in the excision specimen) was 3.67 mm (range 1.55 – 7 mm). The average margin of clearance (including both biopsy margin and excisional margin) was 4.25 mm (range, 1.1 -7.25 mm). With 5 mm clinical margins, the standard of care at our institution, none of the 32 cases had a positive surgical margin or clinical recurrence.

CONCLUSION: We conclude in our small study that 1) non-lentiginous melanoma in-situ is an entity that is rarely diagnosed, 2) many cases reported as melanoma in-situ (assumed to be non-lentiginous in nature) are truly lentigo maligna subtype melanoma in-situ and many pathologists/dermatopathologists may be not reliably distinguish between these two entities, and 3) 5 mm excision margins of non-lentiginous melanoma in-situ appears to be adequate for histologic clearance and cure.

Notes

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