11:25 AM

REVIEW OF EYE INJURIES ASSOCIATED WITH COSMETIC LASER DEVICES

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Background: Cosmetic dermatologic procedures using light or energy-based devices are increasing in popularity. During these procedures, the eye is susceptible to inadvertent damage due to the thin skin of the eyelids and the abundance of chromophores throughout.

Objective: Discuss ocular injuries associated with facial dermatologic laser treatments, the anatomy of the eye related to these procedures and highlight strategies to diminish the incidence of these injuries.

Methods: A PUBMED search was conducted to identify cases of eye injuries associated with dermatologic laser treatments.

Results: Forty-six cases of eye injury associated with dermatologic laser treatments were identified. In the majority of cases (34/46, 74%) no eye protection was used. In nearly all of the cases, the patient sustained the inadvertent ocular injury (39/46, 85%). The most common procedure was laser hair removal of the face (28/46, 61%). Together, the Alexandrite 755nm, Diode 800nm, Diode 810nm, and Nd:YAG 1064nm lasers were used in 35/46 (74%) of cases. The majority of cases (44/46, 96%) developed injuries specific to the affinity of the laser wavelength to the compatible chromophore-rich portion of the eye.

Conclusion: The majority of dermatologic laser-associated eye injury cases have occurred in the context of laser hair removal and are associated with inadequate use of eye protection. In most cases, the patient sustained the inadvertent ocular injury. Practitioners who perform these procedures should have appropriate ocular anatomy knowledge and laser safety training. Based on this review, we continue to recommend strict and appropriate ocular protection for all cosmetic laser procedures.

Category: Early Experiments

11:33 AM

LIGHT POLARIZATION INTERACTION WITH SKIN CONDITIONS ASSESSSED BY POLARIZATION SENSITIVE OPTICAL COHERENCE TOMOGRAPHY

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Background*:* Light polarization interaction with skin conditions has shown promising performance in some early investigations, such as superficial contrast enhancement and melanoma detection. The basic mechanism behind this interaction is yet unknow and its utility is not fully explored.

Objective: To explore the light polarization interaction with skin conditions by polarization sensitive optical coherence tomography (PS-OCT).

Methods: PS-OCT can offer four signal channels. The intensity channel visualizes the layered structure and surface roughness profile of skin in 3D. The degree of polarization uniformity (DOPU) can assess the depolarization which is related to micro-roughness. The phase retardation can characterize collagen organizations; the diattenuation signals are related to tissue anisotropic scattering and absorption. Different locations of skin are imaged. Skin conditions such as age, color, dryness, and roughness, are controlled and investigated. The experiment data will be compared with a model simulation based on polarization and scattering theory.

Results: All the different skin conditions can be viewed from the intensity images. A rough skin surface or a dark skin color will cause a low DOPU. Collagen degeneration due to skin aging and dryness can be assessed by a lower accumulation speed of phase retardation. A high anisotropy caused by aging and irregularities in other conditions can be detected from the diattenuation signals.

Conclusion*:* PS-OCT is a powerful tool to exam the interaction between light polarization and skin conditions. By recording four signal channels simultaneously into a multiple dimensional matrix, PS-OCT can offer a comprehensive examination in skin conditions.

Category: Early experiments with well-defined objectives/hypotheses

11:41 AM

ALLEVIATING POST-OPERATIVE PATIENT ANXIETY IN THE COVID-19 PANDEMIC: A MOHS SURGERY APP

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Background: Post-operative follow-up from Mohs surgery has been impacted by COVID-19. Patients are no longer seen unless an emergency. Our study aims to assess a need for a Mohs Surgery App to alleviate anxiety. The app would include photographs of categorized repairs at several time-points of recovery.

Methods: Telephone interviews were conducted with patients in two categories. Category A includes 2 sub-groups of pre-pandemic patients, while Category B includes 4 sub-groups of post-pandemic patients. Category A patients were seen in-person to manage their anxiety. Within Category A, two follow-up subgroups were selected: 6-months and 1-year pre-pandemic. Category B patients were not seen, unless a rare emergency. Within Category B, four follow-up subgroups were selected: 0-1, 3, 6 and 9-months post-Mohs. Thirty patients per sub-group, to a total of 180. All patients were recruited in a consecutive manner. A modified visual analog scale was used to assess post-operative anxiety.

Results: A total of 101 responses have been obtained so far, between March 2019 and January 2021. 51.5% were male and 48.5% were female. 75.2% indicated that they would find the proposed app helpful, while 24.7% indicated they would not. Patients cited factors such as access to follow-up with other community physicians, low post-operative anxiety, and technological barriers as reasons for not utilizing the proposed app. Demographic factors that may influence future app use include patient age and a history of prior Mohs surgery.

Conclusion: Three-quarters of our patients would derive benefit from the proposed Mohs Surgery App to alleviate post-operative anxiety.

Category: Early experiments with well-defined objectives/hypothesis

11:49 AM

M-CSF-STIMULATED CD11 b$^+$ MYELOID CELLS INDUCE ALOPECIA AREATA IN C3H/ HeJ MICE *VIA* ACTIVATING B LYMPHOCYTES

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Alopecia areata (AA) is an autoimmune skin disease with clinical features of hair loss and skin inflammation. Here, we revealed that dermal injection of either CD11b$^+$ myeloid cells isolated from AA-affected skin or non-AA splenocyte-derived CD11b$^+$ cells treated with macrophage colony-stimulating factor (M-CSF) induces AA in C3H/HeJ mice. The functional similarity of these cells in induction of AA seems to be due to a higher expression of M-CSF found in AA affected skin as compared to that of control. To explore the mechanism by which dermal injection of M-CSF-stimulated CD11b$^+$ cells induce AA, we have co-cultured either AA derived skin cells or M-CSF-stimulated CD11b$^+$ cells with naïve splenocytes. The results of a cell proliferation assay showed activation of splenocytes under both conditions. Most activated splenocytes co-cultured with M-CSF-stimulated myeloid cells were B lymphocytes. Furthermore, dermal injection of M-CSF-stimulated CD11b$^+$ myeloid cells increased the number of hair follicles. In conclusion, in this study, we have provided evidence that M-CSF stimulated CD11b$^+$ cells within the AA dermal lesions induces AA through B cell activation and that initiate a cascade of event lead to inflammatory

Category: Applied/Functional experiments (animal models of disease and *in vivo* studies).

11:57 AM

BEYOND SKIN DEEP: CASE-BASED ONLINE LEARNING MODULES TO IMPROVE THE UNDERSTANDING OF MULTIDISCIPLINARY CARE IN DERMATOLOGY AMONG STUDENTS

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Introduction: Canadian medical schools offer limited clinical dermatology training, and it is difficult for students to understand the strong relevance of dermatology to other areas of medicine. The objective is to evaluate the effectiveness of case-based online modules in improving the understanding of multidisciplinary care in dermatology among medical students.

Methods & Materials: Our team created nine case-based modules on skin conditions that overlaps with ten other disciplines. The modules are composed of multiple-choice questions with explanations, learning objectives, and take-home messages. Their content emphasizes multidisciplinary care in dermatology and centers around patients with different socioeconomic status and skin colors. 35 students were surveyed regarding perceptions of their dermatology curriculum. 20 of them with interests in 17 specialties completed the modules and a survey afterwards.

Results: Only 11.4% of 35 students feel their dermatology education is sufficient, and 73.5% did not feel comfortable seeing patients with skin conditions in clinical settings. All 20 students who completed the modules found the format fits their learning style. Over 90.0% agree that the modules enhanced their knowledge and would help them manage skin conditions in clerkship. 85.0% agree that the modules enhanced their understanding of the multidisciplinary nature in the management of skin conditions in each case.

Conclusion: These findings indicate a need for additional dermatology education for students. Case-based online modules are effective tools to help students better understand the multidisciplinary care in dermatology and provided insight into ways of providing dermatology education for medical students when clinical teaching resource are limited.

Category: Early experiments with well-defined objectives/hypotheses

12:05 PM

PATIENT SATISFACTION SURVEY AT A VANCOUVER PATCH TESTING CLINIC: A TOOL FOR QUALITY IMPROVEMENT

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Introduction

Allergic contact dermatitis (ACD) is a subtype of contact dermatitis characterized by a delayed hypersensitivity eczematous skin reaction to exogenous agents that contact the skin. Patch testing, a specialized test to identify contact allergy, is used to help decrease the burden of eczematous dermatitis in patients with ACD. Here in British Columbia, the Contact Dermatitis Clinic at St. Paul's Hospital is the only dermatology clinic that conducts a comprehensive 80 allergen screening series recommended by the American Contact Dermatitis Society, in addition to supplement allergen testing specific to each patient. Through a satisfaction questionnaire, we aim to describe patient outcomes and identify quality improvement opportunities.

Methods and Results

A 10-question survey was used to collect feedback from 1,226 patients that were patch tested from November 2016 to April 2020 via UBC Qualtrics survey platform. Using both validated Likert scale and open-ended responses, we aimed at assessing four main quality improvement areas: pre-test preparedness, accessibility, identification of allergens, and outcomes. A response rate of 23% (277 completed) was achieved. Overall, patients reported a high degree of satisfaction with pre-test preparedness, allergen identification, and outcomes, with 71% of patients having an allergen identified. Of those who identified as having a positive allergen, 62% (128/205) indicated their rash improved after patch testing. Top allergens identified included fragrances, metals, preservatives (i.e. methylchloroisothiazolinone and methylisothiazolinone), and topical antibiotics. Thematic analysis of open-ended responses found that barriers to patch testing included long wait times, non-Canadian specific allergy avoidance strategies, and lost to follow up.

Conclusion

Patch testing had an appreciable effect on quality of life (QoL) of patients who have ACD, including improvement of cutaneous symptoms. Future QoL opportunities include increasing access to patch testing, the need for more Canadian-specific product avoidance resources, increase follow up including education on non-ACD causes of dermatitis, and the need for ACD-specific QoL assessment tools.

12:13 PM

SECONDARY INTENTION HEALING OVER EXPOSED BONE FOLLOWING MOHS MICROGRAPHIC SURGERY

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Background: Removal of aggressive/longstanding skin cancers with Mohs Micrographic Surgery can result in deep post-surgical defects with exposed bone. In such cases, repair options become challenging due to limited vascularity for standard flap or graft repair. A viable alternate approach is secondary intention healing over exposed bone.

Objective: Demonstrate the utility of secondary intention healing of defects with exposed bone.

Methods/Materials: This is a retrospective case series of 41 patients who had Mohs Micrographic Surgery from July 2010 to January 2020 with post-surgical defects involving exposed bone. These patients then underwent healing by secondary intention rather than active surgical reconstruction.

Results: 90% of patients successfully healed by secondary intention over exposed bone, with 59% having partial loss of periosteum and 41% having full loss of periosteum. Average time to complete granulation was 92 days, and average time to full re-epitheliazation was 186 days. Visual assessment of quality of the final scar resulted in 56% being good, 27% being fair, and 7% being poor. 10% of patients did not successfully heal by secondary intention and were referred to Plastic Surgery for further intervention.

Conclusion: This case series helps to show the utility of secondary intention healing of wounds with exposed bone. It highlights the unpredictability of which patients are able to successfully heal by secondary intention despite factors such as radiation, smoking, diabetes, large defect size, lack of emissary veins, or lack of periosteum. Managing patient expectations and emphasizing importance of good early quality of wound care is important for success.

Category: Early experiments with well-defined objectives/hypotheses

12:21 PM

THE IMPACT OF COVID-19 ON NORTH AMERICAN DERMATOLOGY PRACTICES

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In March 2020, there was mandated closure of non-essential services in many areas across North America, with gradual re-opening as new safety measures and practice guidelines were implemented. Even today, COVID-19 continues to affect the delivery of healthcare services. Specifically in dermatology, clinical care is delivered in close physician-patient proximity through physical exam and use of additional diagnostic and therapeutic procedures. We designed a short quantitative and qualitative survey to better understand how COVID-19 has impacted the delivery of care in North American dermatology practices. This survey was composed of 10 questions examining changes in patient volumes, the use of virtual visits/teledermatology, the frequency of aesthetic and surgical procedures, and other related topics. We identified 102 board-certified dermatologists working in a variety of medical, aesthetic, surgical, and mixed practices, selected based on their geographic location and our ability to access their contact information. Each dermatologist was invited to participate through a personalized e-mail with an anonymized survey link hosted through Qualtrics XM. The survey was viewed by 71 dermatologists and completed by 54 in the 2.5 weeks after distribution. A second wave of e-mails was sent to the remaining 48 dermatologists who had not yet completed the survey, after which 15 participants both viewed and completed the survey. In total, 69 responses were recorded with an overall response rate of 67.6%. The data is currently being analyzed. Understanding the full scope of the impact that COVID-19 continues to have on dermatologic care is paramount to effectively serving our patients.

Category: Early experiments with well-defined objectives/hypotheses

12:29 PM

UBC RURAL AND REMOTE DERMATOLOGY: A PROGRESS REPORT

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We set out to test a model of telemedicine using the Northern Interior division of Northern Health, and set it against the control, the Northeast and Northwest divisions. The COVID-19 pandemic and rapid adoption of Zoom teleconferencing forced a change in our service and impacted our design so that all rural areas in BC were the 'experimental site'. This also included all First Nations communities consulting via the FNHA Doctor of the Day program. Our qualitative and quantitative results will be discussed. These will include month-to-month call volume, location analysis, preferred methods of communication and most common diagnoses encountered. Preliminary results will be presented from interviews with rural practitioners using the service. Referrals have come from most Health Authorities including communities such as Dease Lake, Fort Nelson, Fernie, and Port Hardy. We believe our methods of assessment (still being developed) could be adapted for quality assessment. We will present our argument and evidence that this model of service - which is not limited to our specific methods - can and does fulfill an unmet need.

Category: Early experiments with well-defined objectives/hypotheses

12:37 PM

POLARIZATION MEMORY RATE: A NEW OPTICAL BIOMARKER FOR SKIN CANCER DETECTION

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Background and Objectives: Discriminating between cancerous and benign tissue requires examining tissue features on a cellular level. The current gold standard is to identify histopathological features, but optical technologies provide ways to detect these features faster and non-invasively. This presentation introduces a new optical biomarker for cancer detection called the polarization memory rate (PMR). The polarization of light waves refers to the orientation of their intrinsic oscillations. Polarization includes linear and circular directions of oscillation, and light can range from uniformly polarized to randomly depolarized.

Hypothesis: The nucleus is the primary scatterer within the cell, and in cancerous cells the nucleus is larger and denser. In terms of optical properties, this results in cancerous cells having a higher index of refraction. It has been demonstrated that scatterers with higher indices of refraction depolarize linear polarized light to a greater extent than circular polarized light. PMR is the ratio between circular and linear depolarization, and we hypothesize that this metric can be a sensitive detector for cancerous tissue.
Methods: A literature review of experimental PMR observations across multiple tissue types revealed the theoretical basis for this biomarker. Bringing this theory to practice, cancerous and benign skin lesions were measured by a prototype polarimetry probe to assess their differences in PMR.

Conclusion: Polarization memory rate has been found to be measurable on skin tissue *in vivo*, and sensitive enough to allow for discrimination on *in vivo* skin tissue samples. Future work will focus on the creation of a more rigorous device to more fully observe this polarization biomarker.

Category: Pilot/Exploratory experiments

12:45 PM

THE IMPACT OF COVID-19 ON THE DIAGNOSIS OF MELANOMA IN BRITISH COLUMBIA

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Melanoma is a potentially deadly skin cancer. When a concerning pigmented lesion is found on the skin, efficient detection, biopsy and excision are important. When there are delays in the management of melanoma, patients and the health care system experience increased morbidity, mortality and costs.

On March 17th, 2020, a public health emergency was declared in British Columbia due to the global COVID-19 pandemic. Much of the healthcare system was affected, with thousands of cancelled surgeries and appointments. Many dermatologists and primary care providers switched to a predominantly virtual care model in an attempt to decrease spread of the virus. It is also likely that certain patients avoided seeking medical care due to a fear of contracting the virus.

The impact of the COVID-19 pandemic on patient outcomes remains to be determined. We hypothesize that the COVID-19 pandemic will result in a lower number of biopsies of melanoma and a higher number of patients with more advanced melanoma at diagnosis. To address these hypotheses, we have conducted a retrospective review of pathology reports for melanomas diagnosed in the BC lower mainland, comparing the period March-Oct 2019 to March-Oct 2020.

The results of this study provide insight into the impact of the COVID-19 pandemic in British Columbia. This will help with understanding the adaptability of the healthcare system in BC, provide planning information in anticipation of future pandemics, and also provide planning information for potential future increases in advanced melanoma diagnoses.

Category: Early experiments with well-defined objectives/hypotheses