**Presenter: Anjana Kaur, MBChB, BSc(Hons), MRCS**

**Co-Authors: Muhammad Javed, MD, BSc, MSc (Res), FRCS (Plast)**

**Affiliation: Plastic Surgery Department, Morriston Hospital, Wales, United Kingdom**

The Welsh Centre for Burns and Plastic Surgery (WCBPS) adapted its practice to accommodate the escalation of the COVID-19 pandemic from February 2020. This involved adaptations to burn referral pathways, standard operating procedure/policy, and the use of Virtual Clinics (Telephone/Video) for remote assessment where possible. We undertook this cohort study to evaluate our experience of management of burn injuries during the pandemic and patient experience of adaptation to telemedicine.

**METHODS:** Retrospective review of IBID (International Burn Injury Database) of all presentations and admissions to WCBPS from January 2019 to December 2019 (Control Cohort) and January 2020 to November 2020 (Pandemic Cohort). Demographics, comorbidities, frailty score, mechanism, TBSA, length of stay, and outcomes of injury were reviewed. Statistical analysis has been performed using Z test/unpaired \( t \) test as appropriate. An online questionnaire approved by hospital Research and Development Committee was distributed to patients attending virtual clinics between September 2020 and January 2021.

**RESULTS:** Rate of referrals fell in the pandemic cohort compared with the control cohort. A total of 980 referrals (81/month) were received between January 2019 and December 2019, and 543 (49/month) between January 2020 and November 2020. Average patient age, gender ratio, prevalence of diabetes mellitus, and length of stay (LOS) was comparable between cohorts. Mean TBSA was larger during the pandemic cohort (3.2% versus 1.9%, \( P = 0.0009 \)). A Rockwood frailty score greater than 4 was more prevalent in the pandemic cohort (12.7% versus 2.65%, \( P < 0.0001 \)). A higher incidence of flame burns was noted in the pandemic cohort (\( P < 0.0001 \)), of which 9.7% were associated with deliberate self-harm injuries. Mortality related to burn injury was higher in the pandemic cohort (\( P < 0.09 \)), and no cases of mortality were associated with a proven or suspected COVID-19 infection. In total, 54 adult patients responded to an online survey evaluating remote clinics.

**CONCLUSIONS:** An increase in TBSA and incidence of flame burns was observed during the pandemic. An estimated 92% of the patients were satisfied with their remote assessment. Although remote assessment was welcomed by most, it did not meet the preferences of all.

**Sentinel Lymph Node Biopsy of Melanoma: Does Age Matter?**

**Presenter: Derek Miller, BS**

**Co-Authors: Ralph Rosato, MD, FACS**

**Affiliation: Florida State University College of Medicine, Tallahassee, FL**

**PURPOSE:** Sentinel lymph node biopsy (SLNB) of melanomas is a well-accepted clinical prognostic tool. National guidelines currently recommend SLNB if there is between a 5%–10% probability of having a positive node and offering if >10%.\(^1\) Recent studies have challenged the validity of SLNB and their influence on overall survival rates.\(^2-4\) Our study was prompted by the observation that many elderly patients were forgoing SLNB without recurrence. We hypothesized that age may be associated with SLNB positivity and recurrence rates.

**METHODS:** A retrospective chart review was performed on patients presenting with a primary diagnosis of melanoma in which an SLNB was indicated according to national guidelines. Follow-up data ranged from 1 to 2 years. SLNB positivity and recurrence rates were analyzed and stratified based on age.

**RESULTS:** Fifty-two patients with primary cutaneous melanoma were included. Thirty-one patients underwent an SLNB, whereas 21 patients opted against the procedure. Four patients had a positive SLNB (13.3%, \( N = 31 \)). Stratifying age the results are as follows: patients < 65 years old (Recurrence rates among the SLNB group was 0% at both 1- and 2-year follow-up visits. Among the Non-SLNB group, patients younger than 75 years of age (\( N = 2 \)) had zero recurrences, while two recurrences were found in the 75–84 age group (\( N = 5 \)), and those \( \geq 85 \) (\( N = 14 \)) had zero recurrences.

**CONCLUSIONS:** The decreased SLNB positivity rate among patients \( \geq 75 \) years of age (9.1%) indicates that age may be associated with SLNB positivity. Interestingly, increased age is usually associated with a greater Breslow depth, which correlates with an increased chance of having...
a positive SLN. Furthermore, patients in the Non-SLNB group who were ≥85 years of age did not exhibit recurrence. These data support our initial hypothesis that age may be a prognostic factor for melanoma recurrence and useful for patients in which SLNB is indicated.

REFERENCES:
1. Gradishar WJ et al. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines). *Journal of the National Comprehensive Cancer Network* 2020;18(4).
2. Freeman SR, Gibbs BB, Brodland DG et al. Prognostic value of sentinel lymph node biopsy compared with that of Breslow thickness: implications for informed consent in patients with invasive melanoma. *Dermatologic Surgery* 2013;39(12):1800–1812.
3. Mitra A, Conway C, Walker C, et al. Melanoma sentinel node biopsy and prediction models for relapse and overall survival. *Br J Cancer* 2010;103(8):1229–1236. doi:10.1038/sj.bjc.6605849
4. Sladden M, Zagarella S, Popescu C, Bigby M. No survival benefit for patients with melanoma undergoing sentinel lymph node biopsy: critical appraisal of the multicenter selective lymphadenectomy trial-I final report. *Br J Dermatol*. 2015;172(3):566–571.

13-Cis Retinoic Acid Activates Regenerative Behavior of Primary Human Lymphatic Endothelial Cells

**Presenter:** Jerry Hsu, BS

**Co-Authors:** Roy Yu, BS, Sun Young Park, MS, Wan Jiao, MD, PhD, Dong Won Choi, PhD, Eun Park, MS, Young Kwon Hong, PhD, Alex Wong, MD

**Affiliation:** Keck School of Medicine of University of Southern California, Los Angeles, CA

**PURPOSE:** Lymphatics maintain interstitial fluid homeostasis, while injury leads to lymphatic insufficiency and eventually lymphedema. Previously, we have established the effects of 9-cis retinoic acid (9-cis RA) on lymphatic regeneration as a potential therapeutic agent for secondary lymphedema. The native receptor for 9-cis RA is retinoid X receptor (RXR); however, it is known that 9-cis RA binds to retinoic acid receptor (RAR) as well. Other derivatives of vitamin A, such as 13-cis retinoic acid (13-cis RA) and all-trans retinoic acid, bind RAR and RXR with varying affinity. Although we hypothesize that RXR is the critical receptor in lymphatic endothelial cells (LECs) responsible for prolymphangiogenic responses, this has yet to be proved. To address the current gap in treatment options, we aimed to determine whether 13-cis retinoic acid, a RAR agonist that has been FDA-approved for use in severe acne, is capable of positively affecting LECs in vitro.

**METHODS:** Human primary lymphatic endothelial cells were obtained from discarded human foreskin and were isolated using routine protocols. 13-cis RA was purchased from Sigma-Aldrich (St. Louis, Mo.). LEC proliferation assays were performed with Cell Proliferation Reagent WST-1 (Roche). LECs (6 × 103) were seeded in 96-well plates and treated with vehicle, 9-cis RA (positive control), or 13-cis RA in a low serum media (1% FBS) for 48 hours. WST-1 reagent was added to each well and incubated for 90 minutes. Absorbance was measured at 450 nm in an ELISA reader and cell count was extrapolated from a standard curve. All proliferation assays were performed in quadruplicates. For scratch wound healing assays, LECs (3 × 105) were seeded in Six-well plates and treated with vehicle, 9-cis RA or 13-cis RA in a low serum media. The monolayer was scratched using a 1000-μL pipette tip and images were captured over at least 18 hours, or until full recovery of the scratch area. The rate of migration was determined by subtraction of the final area from the initial area of the migration gap in ImageJ.

**RESULTS:** LECs treated with 13-cis RA demonstrated an increase in cell number of up to 180.4% at 2 mM (P < 0.0001) versus DMSO-treated controls over 48 hours, indicating that 13-cis RA significantly activated proliferation. For the migration studies, scratched areas were nearly recovered in LECs treated with 13-cis RA at 2 mM (P < 0.0001) compared with DMSO-treated controls.

**CONCLUSIONS:** Treatment of human lymphatic endothelial cells with 13-cis RA, a RAR agonist, enhances cell proliferation and migration. Future in vitro studies will compare dose response curves of 13-cis RA and 9-cis RA and their effects on the behavior of LECs at various experimental timepoints. In vivo studies will investigate the effect of 13-cis RA on lymphangiogenesis and lymphatic vessel regeneration using an experimental mouse tail lymphedema model. As a result, 13-cis retinoic acid could serve as a therapeutic agent to treat lymphedema patients.

Free Tissue Transfer Based on Retrograde Recipient Veins in Traumatic Extremity Reconstruction