

116

### **A Prospective Study Comparing Breast Sensation In Neurotized And Non-neurotized Autologous Free Flap Reconstructions Using Electronic Pressure Sensory Gradients**

**Michael Tecce, DO, Jessica R. Cunning, MBA, Michael Tecce, DO, Shelby L. Nathan, MD, Arturo J. Rios-Diaz, MD, Cutler Whitely, BS, Robyn B. Broach, PhD, Joseph M. Serletti, MD**

**University of Pennsylvania, Philadelphia, PA, USA.**

**Purpose:** Restoration of breast sensation following autologous breast reconstruction is integral to the reconstructive paradigm for breast cancer patients. We sought to quantify the impact of neurotization in autologous breast reconstruction on sensation and quality of life (QoL).

**Methods:** A patient-blinded prospective study was undertaken for patients undergoing autologous breast reconstruction. Patients were assigned to neurotized group or non-neurotized group. Using the Pressure-Specified Sensory Device™ to quantify sensation (range: 0-100, 100=lowest sensation), mastectomy and flap skin were tested in four poles at a minimum of 12-months postoperatively. Kruskal-Wallis tests were used to compare sensation and Breast-Q QoL scores between cohorts at the flap-level.

**Results:** One-hundred and fifty-five flaps were tested, of which 49.7% were neurotized. Patients tended to be 53 years-old (IQR 46-61), White (82.2%), non-obese (BMI<30: 57.3%), and have TRAM flaps (79.7%). The neurotized group demonstrated higher sensation at the mastectomy superior pole compared to the non-neurotized group (66.2 [33.5-96.4] vs 83.2 [51.3-100]; p=0.03). Sensation was decreased for patients who underwent radiation therapy (p>0.05) irrespective of neurotization. Of the flaps with minimal sensation (scores>90), sensation at the lateral mastectomy and lateral flap sites were significantly less for non-innervated TRAM flaps than non-innervated DIEP flaps (p=0.03 and p=0.03, respectively). However, no flap-type difference existed amongst innervated flaps (p>0.05). The neurotized group exhibited greater QoL compared to the non-neurotized group in 3 of the 11 QoL domains (p<0.05).

**Conclusions:** Neurotization during autologous breast reconstruction appears to increase sensibility in only one of four quadrants, whereas radiation impairs sensation regardless of innervation status. QoL was higher in the innervation cohort. Further analysis inclusive of change over time is needed as the study progresses.

117

### **Prevalence, Independent Risk Factors, And A Model To Predict Chronic Nerve Pain After Burn Injury**

**Kevin M. Klifto, PharmD, Pooja S. Yesantharao, MS, A. Lee Dellon, MD, PhD, C. Scott Hultman, MD, MBA**

**The Johns Hopkins University School of Medicine, Baltimore, MD, USA.**

**Purpose:** Chronic pain, unrelated to the burn itself, can manifest as a long-term complication in patients sustaining burn injuries. The purpose of this study was to determine the prevalence, independent associated risk factors, and construct a mathematical model predicting a patient's risk of developing chronic nerve pain (CNP) after burn injury.

**Methods:** A retrospective analysis was conducted from 1880 adults admitted to a single institution's Burn Unit from 2014-2019. Of the 1880 patients, 113 developed CNP. CNP was defined as patient-described pain evaluated by ≥two clinicians for ≥six months after burn injury, unrelated to a pre-existing illness/medications. Comparisons between patients admitted to the Burn Unit with no pain and patients admitted to the Burn Unit who developed CNP were performed using binary logistic regression. The modified Delphi process was used for selection of 78 potential risk variables. Multivariate regression techniques were used to derive the model, Brier scores assessed model performance, Area-under-the-curve (AUC) assessed model discrimination, Hosmer-Lemeshow goodness-of-fit test assessed model calibration, and stratified K-fold cross-validation assessed model accuracy and generalizability. Follow-up for the model was set to six months.

**Results:** One hundred thirteen (n=113) of the 1880 burn patients developed CNP as a direct result of burn injury over five years with a prevalence of 6%. Independent risk factors associated with developing CNP were substance abuse (OR=3.7, 95%CI [1.6, 8.6]; p=0.003), current everyday smokers (OR=3.9, 95%CI [1.9, 8.3]; p<0.001), intubated