was thus proposed in this study as a potential preventative pain measure when performed concurrently at the time of amputation.

**METHODS:** TMR was performed concurrently in 40 patients undergoing major limb amputation as a preemptive measure for symptomatic neuromas and phantom limb phenomena across four centers. Outcomes were assessed using the Patient-Reported Outcomes Measurement Information System (PROMIS) and a Numerical Rating Scale and were compared to a cross-section of 727 untreated amputee controls. One-way ANOVA followed by pairwise comparisons of means was conducted between cohorts.

**RESULTS:** Patients undergoing TMR concurrently with major limb amputation had dramatic improvement in residual limb and phantom limb pain compared to untreated amputee controls across all measures. PROMIS score mean differences for phantom limb pain were 8.1 (CI 5.5–10.7) for Pain Intensity, 8.3 (CI 5.3–11.2) for Pain Behavior and 8.6 (CI 6.0–11.2) for Pain Interference, all p<0.001. Mean differences for residual limb pain were 8.4 (CI 5.4–11.3), 10.1 (CI 6.8–13.5), and 8.9 (CI 5.7–12.1) for PROMIS Pain Intensity, Behavior, and Interference, respectively (all p<.001). Numerical Rating Scale (NRS) data also revealed similar improvements in average residual limb pain (1.98 vs 3.89) and phantom limb pain (2.14 vs 3.96) for concurrent TMR amputees compared to the general amputee population.

**CONCLUSION:** Preemptive Targeted Muscle Reinnervation at the time of limb loss should become standard of care for prevention of pathologic phantom and residual limb pain in amputees.

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**Lower Extremity Reconstruction with the Microsurgical Neurosensitive Anterolateral Thigh Flap. Its Impact on Ambulation**

**Presenter:** Anel Gabriela Briceno Abraham, MD

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**PURPOSE:** The versatility and location of the anterolateral thigh flap (ALT) make it well suited for lower extremity reconstruction. The purpose of this study was to evaluate surgical and functional outcomes by specific anatomic regions in the foot to better define the role of the neurosensitive anterolateral thigh flap in lower extremity reconstruction.

**OBJECTIVE:** To determine that the neurosensitive microvascular anterolateral thigh flap provides adequate vascularized skin cover and protective sensitivity for foot reconstruction, allowing the patient to recover weight bearing and ambulation.

**METHODS:** A prospective, longitudinal and observational study was performed, using 20 patients undergoing lower extremity reconstruction with a neurosensitive ALT flap between October 2015 and October 2016 was performed. Sensitive monofilament test and two-point discrimination test were performed before surgery and 6, 12 and 18 months after the procedure.

**RESULTS:** All cases had a microvascular free flap. Defects were located in the forefoot (40%), midfoot (30%) and hindfoot (20%) and ankle (10%)The mean postoperative follow-up was 12 months. There wasn’t any total flap loss. There were 3 cases (15%) of partial dehiscence and one case of donor site infection. There were 2 recipient site complications (10%) of infection, solved by antibiotic therapy. Average of hospitalization stay was 14 days. Partial weight bearing began at an average of 4 weeks, and bipedal gait began at 7 weeks. During the follow-up, all 20 cases achieved full weight bearing, acceptable contour and quality of gait. All cases achieved protective sensitivity and 60% achieved discrimination sensitivity. Overall, 18 patients (90%) returned to their preoperative functional status.

**CONCLUSION:** The variety of ways in which ALT flap reconstructions can be performed suits the diverse tissue requirements of the entire lower extremity especially in the foot where the sensitivity plays a fundamental role in ambulation. In selected patients, neurosensitive microvascular ALT flaps can provide good surgical and functional results and is an effective method of lower extremity reconstruction.

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**Reconstruction of Gustilo Type IIIIC Injuries of the Lower Extremity**

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PURPOSE: Gustilo type IIIC open tibia fractures are characterized by an ischemic limb requiring immediate arterial repair. Despite recent advances in microvascular reconstruction, these patients are at high risk of complications and the decision between primary amputation and limb salvage can be challenging for plastic surgeons. The purpose of this study is to evaluate our experience with Gustilo type IIIC patients who have underwent reconstruction with a free tissue transfer.

METHODS: We retrospectively reviewed an institutional database of all patients who underwent free tissue transfers. Patients with Gustilo type III open tibia fractures that underwent reconstruction with free flap coverage were included in this study. The following information was collected: patient demographics and comorbidities, operative details including flap type and anastomosis details, extent of arterial injury as determined by preoperative angiography and/or intraoperative findings, perioperative complications, and flap outcome (e.g., partial or total failure, take-backs, and salvage rates). To elucidate the difference in outcomes based on the extent arterial injury, we specifically compared the outcomes of Gustilo type IIIC patients and Gustilo type IIIB patients with 1 patent vessel.

RESULTS: Thirty-two patients with Gustilo type IIIC injuries underwent reconstruction with free tissue transfers. The average patient age was 32.6 ± 18 years old, with the majority being male (28, 87.5%). The mechanism of injury was traumatic in all patients. More than one-third of patients received flap coverage within one week of injury. The majority of cases were reconstructed with myocutaneous flaps (24, 75%). The two most commonly used muscle flaps were latissimus dorsi (13, 40.6%) and rectus abdominis (9,28.1%). The remaining two patients were reconstructed with tensor fascia lata and gracilis muscle flaps. Twenty-five percent of patients were reconstructed with fasciocutaneous flaps with the most common being the parascapular flap (4, 12.5%).

The rate of major perioperative complications in the Gustilo type IIIC patients and Gustilo type IIIB patients with one patent vessel was 31.3% and 38.5%, respectively (p = 0.527). Three patients (9.4%) and 5 (15.6%) patients suffered partial and total flap loss, respectively in the Gustilo type IIIC cohort. This was not significantly different than the rates of partial and total flap loss (p=0.209 and p=0.596) in the Gustilo IIIB patients with one patent vessel, which were 12.8% and 20.5%, respectively. In the Gustilo type IIIC group, seven (21.9%) patients were taken back to the operating room and the salvage rate was 28.6% (2/7). The take-back rate in the Gustilo type IIIB group with one patent vessel was 25.6% and salvage rate was 20%. The take-back (p = 0.711) and salvage rates (p= 0.682) between these two groups were not statistically significant.

CONCLUSION: The perioperative complications and flap outcome rates for patients with ischemic limb injuries who underwent free tissue transfer is comparable to those of patients with continuous flow via one patent vessel. Patients who have suffered Gustilo type IIIC open tibia fractures should be considered candidates for limb salvage.

A New Lymphoscintigraphy Staging for Unilateral Extremity Lymphedema: Validation and Correlation between Nuclear Images and Clinical Findings

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BACKGROUND: Approximately 200 million people worldwide suffer from lymphedema.1 Appropriate diagnosis and staging are fundamental for the management of patients with extremity lymphedema.23 Lymphoscintigraphy has long been considered the imaging modality of choice for the diagnosis of lymphatic disorders.43 The purpose of this study was to validate the new Lymphoscintigraphy Staging system for unilateral extremity lymphedema based on a precision medicine concept and to investigate the correlation between the lymphoscintigraphy findings and objective clinical findings.

METHODS: A review of a prospective database was performed for patients with suspected lymphedema who had undergone lymphoscintigraphy for diagnosis and assessment of lymphedema. Patients with unilateral extremity lymphedema were included. Lymphoscintigraphy images were divided into three types: normal drainage, partial obstruction, and total obstruction based on the visualization