venous congestion of the lymph node flap but was successfully salvaged. No complications at the donor or recipient site for the DIEP flap were seen. One patient stage III underwent additional liposuction at 12 months postoperative to improve final results.

**Conclusion:** The combined use of DIEP flap and GE-VLNT flaps in a single-stage procedure is a safe and reliable surgical intervention for patients with postmastectomy lymphedema who desire and are suitable for autologous microvascular breast and lymphatic reconstruction.

**QS24**

**Axonal Regeneration In Autologous Grafts: Does A Single-Stage Muscle Transfer Improve Functional Outcomes?**

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**Purpose:** Facial nerve palsy affects 27-133 people per 100,000 per year. The current optimal surgery for unilateral facial paralysis is a two-stage procedure: the first being a cross facial nerve graft (CFNG) from the active to the paralyzed side of the face, and the second, a free vascularised muscle transfer to the paralyzed side with attachment of the transposed muscle’s nerve to the CFNG. This permits reanimation of the face in response to emotion, as opposed to the use of an alternative donor nerve which requires extensive relearning to achieve little, if any, emotional response. However, only 60% of patients obtain an excellent result. This study sought to investigate the cause for poor axonal regeneration.

**Methods:** A prospective study was conducted in three phases. Functional outcome measures were combined with histological analysis of axon counts obtained using serial section electron microscopy.

First, 15 patients underwent a two-stage CFNG. Biopsies could only be obtained from the donor nerve and the distal end of the CFNG without negatively impacting outcomes. Second, a facial nerve mouse model was developed using the posterior auricular nerve as the donor. 80 6-week-old female C57BL6 mice were divided into two groups; half had the nerve transected and directly repaired (DNR group), and the other half had the nerve transected and repaired using an interposed peroneal nerve graft (NGr group).

Third, 10 patients underwent a single-stage procedure utilizing a vascularised latissimus dorsi muscle. The nerve was transplanted from the paralyzed side of the face to be coapted to a buccal ‘donor’ nerve.

**Results:** The functional eFACE score of the 15 patients significantly improved from 44 (32-56) to 78 (63-97) at two-years follow-up. At the first stage, the mean axonal count of the buccal ‘donor’ nerve was 639 (408-1208). At the second stage, the mean axonal count of the CFNG was 309 (76-784); only 48% of the original axons regenerated across the first neurorrhaphy.

At post-operative week 48, the DNR group had significantly better nerve function as measured by recovery of ear movement than the NGr group (76% vs 30%). There was no difference in axonal counts of the donor nerve between the groups. In the DNR group, 79% of axons successfully regenerated across the neurorrhaphy. In the NGr group, the ability of axons to successfully regenerate across a neurorrhaphy was significantly worse (61% and 52%) with only 32% of the original axonal count being available for reinnervation.

The functional eFACE score of the 10 patients significantly improved from 41 (35-51) to 89 (72-96) at two-years follow-up; these scores were significantly better than the two-stage patient group. A biopsy of the buccal nerve made prior to coaptation (702, 337-1154) confirmed there was no significant difference in axonal counts between the two human groups.

**Conclusion:** The results conclude that the CFNG is detrimental to axonal regeneration. In order to effect optimal
emotional outcome in facial palsy, a single-stage procedure with a muscle that has a nerve able to reach from the paralysed side to the active donor nerve is preferred.

**QS25**

**Limb-preserving Autologous Reconstruction In Patients With Soft-tissue Malignant Neoplasms: An Analysis Of 468 Cases From 2005 - 2017 ACS-NSQIP National Database**

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**Purpose:** Limb-sparing procedures are replacing amputations in patients with limb soft-tissue malignancies. Autologous reconstruction restores limb function while improving quality of life. However, nationwide studies comparing types of flap are lacking. Herein, we conduct a nationwide short-term outcomes analysis of limb-preserving autologous reconstruction in patients undergoing resection of soft-tissue malignant neoplasm.

**Methods:** Patients who underwent limb-preserving autologous reconstruction after soft-tissue malignant neoplasm resection between 2005-2017 were identified using Current Procedural Terminology Codes for the excision/resection and their concurrent reconstruction in the ACS-NSQIP database. Demographics, operative characteristics, and surgical outcomes were assessed. Comparisons between type of flap and extremity were performed.

**Results:** 468 cases were identified: 392 pedicled(121 upper and 271 lower extremities) and 76 free flaps(28 upper and 48 lower extremities). Overall mean age and BMI were 60.1 years and 29.4 kg/m², respectively. Patient demographics were not statistically different between free and pedicled flap groups. The free flap group had a higher risk of unplanned reoperations(adjustedOR 3.6, 95%CI 1.6-8.3). The lower extremity group showed a higher risk of surgical-site infections(SSI) (adjustedOR 3.5, 95%CI 1.5-8.5). Overall, patients with an operative time above the median (3.4 hours) were associated with a higher risk of SSI, bleeding requiring transfusion, and unplanned reoperation (p<0.004).

**Conclusion:** Autologous reconstruction is a powerful option for limb preservation after soft-tissue malignant neoplasm resection. Based on ACS-NSQIP data, free flap reconstruction and lengthier operative time were associated with higher risk of complications. The therapeutic approach should be considered on an individual basis contemplating the risks and benefits of each type of flap.

**QS26**

**Differential Secretomes Of Processed Adipose Grafts, The Stromal Vascular Fraction And Adipose-derived Stem Cells**

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**Purpose:** Autologous fat grafting (AFG) is a widely accepted technique for soft tissue replacement or augmentation; however, graft take or retention remains unpredictable. To address this, there have been numerous variations in the processing technique, including the addition of progenitor cells known as adipose derived stem cells (ASCs) or other cells from the stromal vascular fraction (SVF). The objective of this study was to compare cytokine, chemokine and other protein expression in adipose grafts, the heterogenous SVF and a pure population of ASCs.

**Methods:** Adipose grafts were harvested from healthy female donors and processed via three commonly used techniques: centrifugation (C), an active filtration device (AF, Revolve) or a passive filtration system (PF, Puregraft). Each resulting graft was further processed to isolate the SVF and protein for analysis. A pure population of ASCs expanded from each donor to passage 4 were used for comparison.

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**Results:** When comparing cytokine expression between the graft, SVF cells and pure ASCs, we found variations