lymphographic outcomes, including ICG pattern and LVB patency, following axillary ILR in patients at high risk for breast cancer associated lymphedema.

**Methods:** Baseline ICG studies of 15 patients who underwent ILR were compared to studies obtained during secondary stage breast reconstructive procedures to assess for any changes in lymphatic morphology and transit in the at-risk arm.

**Results:** All 15 patients in this study demonstrated linear lymphatic flow in intra-operative lymphography studies performed during the initial lymphatic reconstruction. An average of 2.4 (range 1-4) LVBs were performed per patient. Only 1 patient in this study group had preservation of incontinuity lymphatics at time of ALND. Followup lymphographic studies showed clear, linear lymphatic transit in 12/15 patients. Only 1 patient in this study group had preservation of incontinuity lymphatics at time of ALND. Followup lymphographic studies showed clear, linear lymphatic transit in 12/15 patients. Of these 12 patients, an average of 2.5 LVBs were performed, 10 received chemotherapy (7 neoadjuvant, 3 adjuvant), and all 12 received post mastectomy radiation (PMRT). Dermal backflow patterns of varying severity were recorded in 3/15 patients, two of whom showed signs of lymphedema prior to their followup study and the last went on to develop clinically detectable lymphedema. Of these 3 patients, an average of 2 LVBs were performed, all received chemotherapy (2 neoadjuvant, 1 adjuvant) and 2/3 underwent PMRT. Of the 12 patients that remain lymphedema-free, 7 post-operative studies demonstrated clear visualization of linear ICG flow from the lymphatics of the arm into the axilla without evidence of lymphatic collateralization. An average of 3 LVBs were performed in this group and 100% of these patients received adjuvant radiation.

**Conclusion:** We have demonstrated that ICG lymphography can be implemented as a post-operative tool to assess lymphatic function in patients who have undergone ILR in the axilla. Post-operative imaging studies in the majority of patients demonstrated linear ICG flow with evidence of lymphatic contractility and velocity similar to baseline studies obtained at the time of lymphadenectomy and ILR. Additionally, ICG flow patterns through the axilla in post-operative imaging studies provided visual evidence supporting sustained LVB patency despite inflammation and tissue fibrosis associated with axillary irradiation.

**QUICK SHOTS**

**QS1**

**Pre-implanted Nerve Grafts (PING) to Improve Functional Outcomes in VCA**

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**Purpose:** Improved graft reinnervation and functional recovery would greatly enhance the utility of vascularized composite allotransplantation (VCA). Pre-implantation of nerve grafts in a limb transplant recipient prior to transplantation to increase the length of the severed nerves in the amputation stump offers a novel, readily translatable approach to this problem. At the time of transplantation a pre-implanted nerve graft (PING) would be elevated from its wound bed in the amputated stump and unfurled distally into the transplanted limb, allowing for a more distal nerve coaptation.

**Methods:** We used a reversed sciatic-tibial nerve isograft coapted end-to-end to a median nerve in a rat to: (1) determine viability of distal axons after elevating PINGs; and (2) assess for ischemic injury to axons in the distal PING following elevation from the wound bed. For axonal viability, grafts of varying lengths (2cm,3cm,4cm, n≥5/group) were left to regenerate for 8 weeks. The distal ends were then biopsied prior to elevation, and again one week after elevation. For ischemia assessment, blood flow along 4cm long PINGs was measured with laser doppler at multiple timepoints: baseline (at time of grafting), 8 weeks after grafting (before elevation), immediately after elevation, and 3 and 7 days post-elevation (n=8/timepoint). Means were compared with t-tests and ANOVA. A pig forelimb model was used to assess the functional impact of PINGs. A 6cm long reversed ulnar-PING was coapted to the proximally transected ulnar nerve. After 12 weeks of regeneration, the distal PING was transferred end-to-end to the median nerve just proximal to the elbow. A control group underwent ulnar-to-median nerve transfer 6cm proximal to the elbow (n=4 limbs/group). Hoof flexion force was measured every three weeks.
**Results**

**Axonal viability:** after 8 weeks, axons had regenerated into the distal grafts in all lengths: mean myelinated axon counts (±SD): 7043 (±790), 6066 (±1838), 6491 (±983) in 2cm, 3cm, 4cm grafts, with no differences between graft lengths (p=0.48). One week after elevation and unfurling, the number of myelinated axons was significantly decreased in all groups (p<0.006): 3821 (±567), 2953 (±1107), 2894 (±1761) in 2cm, 3cm, 4cm grafts, with no differences between lengths (p=0.91).

**Ischemic injury:** immediately after elevating a PING, blood flow within the distal half of the graft fell to baseline levels (i.e. no blood flow). 3 days after elevation, blood flow throughout the graft was significantly above baseline (p≤0.04) and matched/exceeded flow measured immediately prior to elevation.

**Functional impact:** preliminary results suggest PINGs can deliver rapid functional recovery.

**Conclusions:** Axons remain present in clinically relevant numbers at the distal ends of PINGs after elevation and unfurling. A decrease in axon counts after elevation may relate to ischemia in the distal PING immediately after elevation. Preliminary functional results show PINGs are capable of delivering early functional recovery.

**QS2**

**Outcomes Of Pediatric Dynamic Facial Reanimation After Two Decades**

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**Purpose:** Pediatric facial paralysis has substantial functional consequences in a growing child including impaired quality of life. Microneurovascular facial reanimation is the gold standard for smile reconstruction; however, quantitative data are lacking regarding long-term outcomes, particularly beyond 10 years. The primary objective of this study was to evaluate the long-term surgical and patient-reported outcomes after dynamic reconstruction of unilateral facial paralysis in childhood.

**Methods:** A cross-sectional study was performed of patients in our institutional facial paralysis database (1978-2008) who underwent dynamic reconstruction of unilateral facial paralysis 20 or more years ago. All patients were treated as children with a staged cross face nerve graft and free functioning muscle transfer. Frontal facial photographs in repose and maximal smile prior to surgery, within 2 years post-surgery, and at long term follow-up were analyzed using the MEEI Face-Gram software for commissure excursion. Patient-reported outcomes were obtained using the FaCE Scale for subjective facial impairment and disability, as well as the FACE-Q Satisfaction with Outcome and FACE-Q Social Function scales. Results are reported as median [IQR] and non-parametric statistical analysis was performed with alpha of 0.05.

**Results:** Eleven patients were included with long term follow-up of 23.7 [5.6] years (6 females, 5 males; 5 congenital, 6 acquired; age at surgery 7.3 [6.3] years). For surgical quantitative measures, commissure excursion significantly improved from prior to surgery (-1.3 [7.4] mm) compared to follow up within 2 years post-surgery (7.0 [1.7] mm) (p<0.05) and from prior to surgery compared to long term follow-up (8.3 [4.9] mm) (p<0.001). There was no statistically significant difference in commissure excursion within 2 years post-surgery and at long term follow-up (p>0.05). For patient-reported outcomes, median FaCE Scale scores showed good function for social function (81/100), oral function (88/100), facial comfort (92/100), and overall score (75/100). On the FACE-Q Satisfaction with Outcome scale, 10/11 respondents somewhat agreed or definitely agreed with the statement, “I am pleased with the result.” On the FACE-Q Social Function scale, 10/11 respondents somewhat agreed or definitely agreed with the statements, “I make a good first impression” and “I feel confident when I participate in group situations.”

**Conclusion:** Dynamic reconstruction of unilateral facial paralysis in young children improves commissure excursion that is maintained at long-term follow up. As adults, these patients report a high level of satisfaction and social functioning with their smile reconstruction.

**QS3**

**The Ideal Match: Optimizing Partial Face Transplants In Terms Of Skin Tone Discrepancies**

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