September 2018. All patients were female with a mean age of 59.6 (41–73) years and BMI of 28.8 (25.1–32.3) kg/m². All patients were classified with stage II lymphedema using the International Lymphedema Staging (ILS) criteria. Mean flap weight was 30 (22–40) grams and mean number of lymph nodes transferred detected by intraoperative ultrasound was 7.6 (6–11). In all patients, the right gastroepiploic artery and vein were anastomosed to the proximal end of the radial artery and to one vena comitante, respectively. An anastomosis of the distal end of the radial artery to the left gastroepiploic artery was performed. The intervening segment of the native radial artery was removed. The flap was then supercharged by anastomosing the left gastroepiploic vein to the cephalic vein. All patients followed the standard protocol for postoperative care at our institution. There were no flap losses or peri-operative complications.

CONCLUSION: The flow-through omental free flap to the forearm should be considered as a reliable surgical option for patients with upper extremity BCRL. A distinct advantage of this inset includes moderating the arterial in-flow into the inherent high-pressure environment of the omental flap to avoid an inflow-outflow mismatch. Further study is needed to validate this technique in a larger study sample with longer follow-up.

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Anti α-Gal Nanoparticles Ameliorate Radiation-Induced Wound Healing Impairment

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PURPOSE: Radiation is a common primary, adjuvant and neoadjuvant therapy in oncological patients, resulting in damage to the local tissues and permanently compromised wound healing. As a result, surgery in irradiated tissue is known to have significantly higher rates of complications. It is thought that one cause of impaired wound healing is the aberrant inflammatory response that occurs in irradiated tissues. Humans are continually and safely exposed to the natural antigen α-gal (Galalpha1-3Galbeta1-(3)4GlcNAc-R), and 1% of their antibodies are directed against the antigen. We have previously demonstrated that the topical application of α-gal nanoparticles can significantly accelerate wound healing in both normal and diabetic wounds likely due to accelerated macrophage recruitment. We hypothesized that application of α-gal nanoparticles would similarly enhance wound healing in irradiated wounds.

METHODS: Since mice normally produce the antigen α-gal, α-1,3galactosyltrasferase knockout mice (which do not produce the antigen and therefore can be stimulated to produce antibodies against it) were used in all experiments. Mice were immunized to produce anti α-gal antibodies at titers comparable to those seen in humans. Dorsal skin was isolated using a low-pressure clamp as previously described and was treated with one session of 40Gy. Ten days after radiation two 6-mm bilateral dorsal splinted wounds were created, and these were then treated with α-gal nanoparticles in a 2% carboxymethyl cellulose (CMC) carrier, immediately after wounding and again on postoperative day 1. Control wild type and knockout mice underwent similar irradiation and wounding protocols but were treated with phosphate buffered saline (PBS) in 2% CMC. Wounds were harvested from all animals on days 3, 6, 9, 12 and 15, fixed, sectioned, and H&E and IHC performed to determine the extent of keratinocyte migration, granulation tissue deposition, neovascularization and macrophage invasion.

RESULTS: Full closure of all wounds by day 9 in the non-irradiated control compared to no completely closed wounds in the radiated group confirmed the known inhibitory effects of irradiation on wound healing. In addition, histological changes such as increased epidermal thickness in the tissue surrounding the wound further confirmed the effects of irradiation on the skin. Histologic analysis demonstrated significantly enhanced keratinocyte migration in the α-gal nano-particle treated group by day 15 in comparison to saline treated group (2.37mm versus 0.58mm, p<0.001). Fifteen days after wounding 25% of all α-gal treated wounds were completely healed as oppose to only 10% in the saline treated group. Analysis of later time points is currently underway.

CONCLUSION: Topical application of α-gal nanoparticles onto radiated wounds significantly accelerates the rate and degree of wound closure. We believe this naturally occurring agent has great promise for translation in plastic surgery as it has demonstrated efficacy in not only
normal wounds but pathologic (diabetic, radiated) ones as well. Further work continues towards a better understanding of the mechanisms underlying the salutary effects of alpha gal.

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Denervation Induced Degradation of Motor Endplates can be Delayed Using Local Supplementation of Agrin at the Time of Injury.

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PURPOSE: Robust muscle atrophy and fibrosis are cited as the prime causes for the permanence of motor deficits following surgical intervention for a denervation injury. Following a peripheral nerve transection, regenerating axons traverse long distances to reinnervate their target organs. However, due to the slow rate of axonal regrowth and a large segmental defect, muscle atrophy and destabilization of the neuromuscular junction (NMJ) usually proceeds before reinnervation occurs. Agrin is characterized as an essential component of NMJ formation and synaptogenesis. Here, we utilize an \textit{in vivo} agrin deficient mouse nerve denervation model to both characterize the morphology of agrin deficient endplates as well as the response of the NMJ to local delivery of agrin following a denervation event. We found the endplates of agrin-deficient mice in a more degraded states than the endplates of wildtype mice following denervation. We also found that local delivery of agrin following denervation serves to transiently improve motor endplate morphology. We thus demonstrate the efficacy of using a biomolecular therapeutic approach to maintain and preserve the denervated NMJ.

MATERIALS AND METHODS: A denervation model was created in 6-week-old mice from WT and agrin deficient C57BL/6 strains by excising 10mm right sciatic nerve segment from the mid-thigh of the mice and suturing the proximal nerve stump to the gluteal muscle with 9-0 suture so as to prevent regeneration. Agrin deficient mice were either injected with supplemental agrin or PBS as a control at the site of injury. The downstream denervated and contralateral control soleus, plantaris and gastrocnemius muscles were harvested for immunohistochemistry, cryo-sections with H&E staining, and quantitative western blots at the 1,2,4,8 and 16-week timepoints. Quantification of motor endplate morphology was done using Velocity 3-D image software. Quantification of muscle fiber diameter was done using ImageJ software.

RESULTS: Fluorescence confocal imaging of harvested soleus muscles revealed that agrin supplemented animals retained superior motor endplate morphology over control animals in all timepoints. The average surface area of agrin supplemented endplates were significantly greater than control endplates in all analyzed timepoints (p <0.05)

CONCLUSION: Highlighting the importance of agrin, we have shown that even a single supplemental dose of agrin delivered locally at the site of injury is effective in preserving motor endplates in denervated mice hindlimbs even at the latest time points. This is consistent with our previous work that detailed MMP3 knock down maintained agrin at the NMJ and thereby preserved the motor endplates so as to improve function recovery. Taken together, these current experiments support the strategy to preserve motor endplates so as to prolong the window of opportunity for surgical intervention after a traumatic nerve injury.

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Clinical Outcomes in Prepectoral Stage 1 Breast Reconstruction

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PURPOSE: Plastic surgeons are increasingly exploring prepectoral breast reconstruction as an option for their patients, but there is little evidence on clinical outcomes to guide this decision-making process. The placement of a prosthetic device superficial to the pectoralis major muscle is an attractive breast reconstruction technique addressing the issue of animation deformity and incurring less