moyamoya disease (6). Flaps included flow through radial forearm fasciocutaneous flaps (2), a flow through radial forearm fascial flap (1) and flow through pedicled temporoparietal fascial flaps (4). The superficial temporal vessels (6) and facial vessels (1) were used as the recipient site pedicle. Flow through reperfusion was established into the middle cerebral artery (5) and anterior communicating artery (2). There were no intraoperative complications. All flaps survived and there were no donor site complications. Postoperative imaging demonstrated graft patency in 6/7 patients. In one case of flow through TPF flap, the direct graft failed, but the indirect flap remained vascularized.

CONCLUSIONS: Flow through flaps can be safely used for conditions where combined arterial bypass and soft tissue procedures are required. Early outcomes have not demonstrated any major complications. Long-term results with direct and indirect re-vascularization are pending.

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35 Years of Lower Extremity Take-Backs: Free Flap Type Influences Salvage Outcomes

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PURPOSE: Free flaps for lower extremity trauma reconstruction have a notoriously high failure rate compared with other anatomic sites. In addition, the choice between fasciocutaneous and muscle-based flaps remains controversial: muscle flaps provide pliable bulk for elimination of dead space and may promote osseous union while fasciocutaneous flaps avoid muscle sacrifice, are more easily re-elevated, and may provide a superior aesthetic result. Considering the high incidence of lower extremity flap failure, we compared salvage rates after take-backs for vascular compromise between fasciocutaneous and muscle free flaps for lower extremity trauma reconstruction.

METHODS: Retrospective institutional registry review of 2,898 free flaps performed between 1979–2016 identified 806 lower extremity reconstructions; 361 soft tissue flaps performed for Gustilo IIIB/C coverage met inclusion criteria. Patient demographics, injury mechanism/location, flap type, operative details, and peri-operative outcomes were evaluated. Complications, take-backs, and flap failure rates were compared between muscle and fasciocutaneous flaps using Chi-square and logistic regression. Bonferroni adjusted z tests were used to determine the association between sub-location of injury and flap type. Complication and take-back rates were additionally stratified by defect location and flap type to help eliminate confounding variables.

RESULTS: Overall, muscle flaps predominated (n=287, 79.9%) compared to fasciocutaneous (n=74, 20.5%). Congruent with traditional reconstructive dogma, the distal third was most common defect location (55.5%); within this sub-location, a higher percentage of fasciocutaneous flaps were used (72.5% vs. 51.3%, p=0.016). Fasciocutaneous flaps had smaller mean surface area compared to muscle (205 ± 115cm² vs. 301 ± 253cm², p<0.001). Complications occurred in 143 flaps (39.8%) with 37 partial flap losses (10.3%), and 31 total flap losses (8.6%). Overall complication rates were comparable between muscle and fasciocutaneous flaps (43.5% vs. 39.4%, p=0.538). Partial flap losses were significantly more common among muscle flaps (12.1% vs. 4.1%, p=0.009), however, similar rates of total flap failure occurred in both groups (8.7% vs. 8.1%, p=0.772). Emergent return to the operating room for vascular compromise occurred in 45 flaps (12.4%) due to venous (n=26, 57.8%), arterial (n=14, 31.0%), or undetermined (n=5, 11.1%) causes. There was a trend towards earlier take-backs among fasciocutaneous flaps compared to muscle (1.93 ± 2.5 vs. 3.97 ± 4.8 days, p=0.072). Regression analysis controlling for age, sex, time since injury, number of veins, and flap size found a significantly higher take-back rates among fasciocutaneous flaps (n=15, 20.2%) compared to muscle (n=30, 10.5%) (RR=2.63, p=0.027). Despite higher take-back rates, however, additional regression analysis controlling for the same variables plus skin paddle presence demonstrated higher rates of successful flap salvage after take-backs among fasciocutaneous flaps (66.7%) compared to muscle (16.7%), (RR=13.03, p=0.038).

CONCLUSION: Compared to muscle, fasciocutaneous flaps demonstrated lower partial flap failure rates despite more frequent take-backs for vascular compromise. These findings are likely related to a combination of lower metabolic demand in fasciocutaneous tissue compared to muscle and easier visual recognition of vascular. Interestingly, this
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was independent of both flap size and skin paddle presence. In the context of higher failure rates among lower extremity trauma free flaps, our results suggest improved outcomes with fasciocutaneous tissue compared to muscle.

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Obesity and the Anterior Abdominal Wall Vasculature: Does Weight Gain Influence Perforator Anatomy?

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PURPOSE: Given the national trends in obesity, reconstructive surgeons are faced with an increasing number of overweight and obese women interested in post-mastectomy breast reconstruction. While the link between obesity and worse postoperative outcomes is well-established, few studies have explored the influence of weight gain on the vasculature of the anterior abdominal wall.

METHODS: A retrospective, radiographic review was conducted of all female patients who underwent computed tomographic angiography (CTA) of the anterior abdominal wall between January 2009 and December 2013. CTA studies were evaluated for perforator quality and quantity. Patients were stratified by body mass index (BMI).

RESULTS: There were a total of 916 hemiabdomens included in the study. There was a statistically significant positive correlation between BMI and size of the flap ($p < 0.01$). There was no statistically significant correlation between BMI and deep inferior epigastric artery (DIEA) diameter or mean diameter of major (> 1 mm) DIEA perforators. There was a statistically significant negative correlation between BMI and number of major DIEA perforators ($p < 0.01$).

CONCLUSION: Despite the increased demands of excess abdominal adiposity, DIEA perforator caliber was unaffected by weight gain. That the number of major DIEA perforators decreased with increasing body weight may indicate either a limitation of CTA imaging protocols in overweight and obese patients or increased importance of the superficial inferior epigastric system.

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Reverse Distal Transverse Palmar Arch in Distal Digital Replantation

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PURPOSE: Refinements in microsurgery have made distal finger replantation an established technique with high success rates and good functional and aesthetic outcomes. However, it still represents a technically demanding procedure due to the small vessel caliber and frequent lack of vessel length, requiring the use of interpositional venous grafts in some instances. The purpose of this study is to provide a technical description and the results of a new technique for arterial anastomosis in fingertip replantation, whereby the need for venous grafts is eliminated.

METHODS: At the level of the nail base, the ulnar and radial digital arteries anastomose, forming the distal transverse palmar arch. By ligating one side of the arch, we can mobilize it and turn it distally for anastomosis in the distal stump, or proximally for arteriovenous shunting. Applying this technique, eleven cases (6 males and 5 females; age range, 18–54 years) of distal digital replantation were performed between January 2011 and May 2016. This technique was used for arterial anastomosis in ten cases and arteriovenous shunting for venous drainage in one case. A retrospective case review was conducted. The technical description and clinical outcome evaluations are presented.

RESULTS: Ten of the eleven replanted digits survived, corresponding to an overall success rate of 91%. One replant failed due to venous insufficiency. Blood transfusions were not required for any of the patients. Ten cases remained in hospital and one case was managed on an outpatient basis. Follow-up (range, 1.5 to 5 months) revealed