perioperative course. Despite significant donor (10%–20%) and recipient (20%–30%) site complication rates the vertical rectus abdominis myocutaneous flap is currently the gold standard reconstruction for complex perineal defects. On this background the inferior gluteal artery myocutaneous flap was introduced and refined at our institution over a number of years, which includes the use of adjunctive mesh. In 56 consecutive patients, it has proven to provide a simple and reliable method of achieving primary wound healing allowing for early day 1 postoperative mobilization to minimize perioperative morbidity, and a durable reconstruction of the perineum with almost no donor site morbidity.

METHODS AND MATERIAL: Records of all patients who underwent pelvic exenteration and plastic surgical reconstruction at Peter MacCallum Cancer Centre, Melbourne, Australia between January 2015 and December 2019 were retrospectively reviewed following ethics approval. All data relating to patient demographics, comorbidities, tumor pathology and grade, surgeries, adjuvant therapies and perioperative medical and surgical complications was collected from a prospectively maintained database of pelvic exenterations. Specific to the reconstruction, early outcome measures included partial/total flap failure, donor site or flap dehiscence, hematoma, infection and early (<30 days) return to theatre. Late outcome measures included revision surgeries, abdominal or perineal hernia, fistula and symptomatic flap bulk. The minimum follow-up period was 3 months.

RESULTS: There were 56 consecutive pelvic exenteration patients, all of whom were reconstructed by 1 of 2 plastic and reconstructive surgeons. Seventy percent of patients had rectal adenocarcinoma, whereas 30% of patients had recurrent disease. Ninety-eight percent were irradiated. Using the Royal Marsden Pelvic Exenteration Classification, there were equal rates of anterior, posterior and lateral pelvic exenterations. Mesh was used in 14 patients, all in the final year of the study. There were no partial/total flap failures. There were 3 early (<30 days) return to theatre, 2 for flap dehiscence, 1 for evacuation of a donor site hematoma. There was one surgical site infection at each donor and recipient site. There were no mesh complications or fistula. There was one perineal hernia and one late flap revision for excessive bulk.

CONCLUSION: This novel reconstructive method based on the inferior gluteal artery myocutaneous flap is technically simple and safe allowing for early mobilization whilst providing a durable reconstruction with minimal donor morbidity. Use of adjunctive mesh is safe. We argue that the IGAM flap, not the vertical rectus abdominis myocutaneous, is the more appropriate reconstruction for the complex perineal defect and for this vulnerable cohort of patients.

Bony Defects of the Foot Lead to High Rates of Transfer Lesion Development: Soft Tissue Reconstruction Is Not Enough in the Chronic Wound Population

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BACKGROUND: Bony resection is often necessary before soft tissue reconstruction in the chronic wound population due to osteomyelitis and bony abnormalities. Although transmetatarsal amputation is argued to be the most functional approach when extensive bony resection is required, recent evidence suggests preservation of the first 2 rays may improve load-bearing at the expense of an increased risk of subsequent procedures.1 Altering the metatarsal parabola also increases the risk of transfer lesion development as one metatarsal takes on more weight. The aim of this study was to investigate the risks of ulcer recurrence and transfer lesion development after microsurgical soft tissue reconstruction with underlying bony defects.

METHODS: A retrospective review of lower extremity free tissue transfer (FTT) for chronic wounds with underlying bony defects at our institution from 2011 to 2019 was performed. Data collected included demographics, comorbidities, wound locations, and FTT characteristics. Outcomes of interest were ulcer recurrence and development of transfer lesions post-FTT. Multivariate logistic regression was used to produce adjusted odds ratios for transfer lesion development using a backward model.

RESULTS: We identified 64 FTT procedures performed for lower extremity salvage with bony defects. Mean age at time of FTT was 55.9 years old (SD = 11.8). Mean Charlson Comorbidity Index was 4.1 (SD = 2.0). Common comorbidities included: diabetes 76.6% and osteomyelitis 68.8%. The majority of bony defects involved the tripod of the foot (79.7%) with resection of a portion of the first metatarsal (46.9%), fifth metatarsal (51.6%) or calcaneus (21.9%).
Wounds developed post-FTT in 70.3%. The original ulcer recurred in 39.1% while transfer lesions developed in 43.8%. Median time to transfer lesion development was 3.7 months. On bivariate analysis, neither tripod ($P = 0.104$), first metatarsal ($P = 0.053$), nor fifth metatarsal ($P = 0.198$) defects had significant relationships with increased odds of transfer lesion development. Calcaneal defects also did not exhibit a significant relationship with transfer lesion development ($P = 0.939$). Diabetes ($P = 0.043$) and plantar weightbearing defect ($P = 0.045$) exhibited significant relationships with transfer lesion development. On multivariate analysis, both first metatarsal (odds ratio [OR], 7.2; 95% CI, 1.6–31.8) and plantar weightbearing defects (OR, 4.6; 95% CI, 1.1–19.1) were independently associated with increased odds of transfer lesions. Fasciocutaneous flap type was significant for decreased odds of transfer lesions (OR, 0.15; 95% CI, 0.03–0.66). Diabetes was no longer a significant predictor for transfer lesion development.

**CONCLUSIONS:** Defects of the load-bearing tripod, particularly the first and fifth metatarsal, significantly increase the risk of transfer lesion development after FTT. While solely soft tissue reconstruction with FTT achieves success in the short term, transfer lesions occur at high rates in the months to years following initial healing. Use of composite osteocutaneous flaps may be valuable in this population to decrease transfer lesion risk by achieving both bony and soft tissue reconstruction.

**REFERENCE:**
1. Suh YC, Kushida-Contreras BH, Suh HP, et al. Is reconstruction preserving the first ray or first two rays better than full transmetatarsal amputation in diabetic foot? Plast Reconstr Surg. 2019;143:294–305.

The Addition of Fluorescence to the University of Wisconsin “Blue-Blood” Chicken Thigh Model Significantly Enhances Its Effectiveness As a Suprmicrosurgery Training Tool

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**BACKGROUND:** The skills required for supermicrosurgery are hard earned and difficult to master. The University of Wisconsin “blue-blood” chicken thigh model has proven to be an excellent source of small vessels (down to 0.25 mm) but assessing the quality of anastomoses at this spatial scale has proven difficult. Without the capacity for self-assessment, the chicken thigh model becomes a much less effective training tool. We evaluated whether augmentation of this realistic training model with fluorescent imaging would enhance assessment of supermicrosurgical anastomoses, and therefore improve real-time feedback to trainees.

**METHODS:** White light with and without fluorescence imaging overlay captured the infusion of colored saline and fluorescent indocyanine green “blood” through the vessels (n = 7 with diameters ranging from 0.35 to 0.55 mm). Videos with and without fluorescence overlay were separated, randomized, and shown to 7 fellowship-trained microsurgeons at the University of Wisconsin-Madison who rated each anastomosis as “patent”, “not patent” or “unsure.” Surgeon accuracy, uncertainty, and inter-rater agreement were measured to evaluate the effectiveness of each imaging modality for assessing supermicrosurgical anastomoses. Staff opinion regarding the use of fluorescent imaging was also polled using a Likert scale.

**RESULTS:** When assessing the quality of supermicrosurgical anastomoses, the use of fluorescence significantly increased surgeon accuracy to 91% compared with 47% with white light alone ($P = 0.015$), significantly decreased surgeon uncertainty to 4% compared to 41% with white light alone ($P = 0.011$), and significantly improved inter-rater agreement to 91.2% compared with 53.0% with white light alone ($P = 0.016$). Additionally, 100% of participating surgeons “strongly agreed” that the use of fluorescence improved their ability to assess the patency of anastomoses. All of the participating surgeons either “agreed” (43%), or “strongly agreed” (57%) that the use of fluorescence improved their ability to assess for anastomotic leaks.

**CONCLUSIONS:** Augmentation of the University of Wisconsin “blue-blood” chicken thigh model with indocyanine green fluorescence significantly improves accuracy, decreases uncertainty and improves inter-rater agreement when assessing supermicrosurgical anastomoses in a training setting. Now, with fluorescence, the “blue-blood” chicken thigh model is capable of providing high quality, real-time feedback at the supermicrosurgery scale, redeeming it as an effective training tool for supermicrosurgery skills.

**REFERENCE:**