fVCA, 100% of the patients depending on tracheostomy and gastrostomy were decannulated. Compared to pre-transplant state, more than 50% of patients had improvements in quality of life (QoL), eating, speech, motor and sensory functions. Overall, the patients had 0.92 acute rejection episodes per 1 transplant year (TY). The treatment response did not correlate with histological grades of rejection, since the adjustment of the maintenance immunosuppression alone resolved 27.1% and 36.2% of all grade 2 and 3 rejection episodes, respectively. Bacterial infections had a higher incidence rate (0.59 events/1 TR) than viral (0.49 events/1 TR) and fungal infections (0.14 events/1 TR). For both acute rejection and infectious episodes, the incidence rates decreased after the first post-transplant year. Transient nephrotoxic episodes (30.4%), dyslipidemia (21.7%), chronic kidney disease (13.0%), hypertension (13.0%), and diabetes mellitus (13.0%) were among the most commonly developed metabolic complications postoperatively. Posttransplant lymphoproliferative disease, lung cancer, and in situ cervix carcinoma presented all equally in 4.3% of the patients. Chronic skin changes (maculopapular lesions, papillary dermal sclerosis, lichenoid aspect) were observed in 30.4% of patients but they did not correlate with decreased allograft function. Chronic vascular rejections were confirmed in 2 patients and led to allograft loss after 8 and 9 years. Two patients died after 9 and 4 years postoperatively due to lung cancer and suicide, respectively. The quantitative outcome measures for which an important number of patients had missing data were mouth opening (82.6%), speech intelligibility test (78.3%), 2-point discrimination (69.6%), hot/cold discrimination (60.9%), monofilament test (56.5%), motor function (electromyography/manual exam) (56.5%), and the QoL (34.8%).

CONCLUSION: This multicenter compilation of long-term outcomes after fVCA shows an overall favorable postoperative improvement in QoL and allograft functionality. However, the data suggest that, in some cases, the positive outcomes can be compromised by immunosuppression-related complications and the threat of chronic rejection. Future outcomes research in fVCA should focus on standardizing the outcome measures between the centers as well as refining the tools for measurement of procedure-specific functional and QoL gains.

Fleur-de-Lys Myocutaneous Flap for Complex Sacral Reconstruction

Presenter: Lucas Kreutz-Rodrigues, MD

Co-Authors: Samir Mardini, MD; Tarek Elgendy, MBBS; Karim Bakri, MBBS

Affiliation: Mayo Clinic, Rochester, MN

INTRODUCTION: Massive sacral defect resulting from total sacrectomy presents a reconstructive challenge, and in some cases, the use of vertical or transverse Rectus Abdominis Muscle (RAM) flap may not provide enough soft tissue to reconstruct it. The use of Fleur-de-lys flap technique has been described in cases of autologous breast reconstruction and for thoracic wound defects. The aim of this study is to describe the surgical technique of the combination of Transversal Rectus Abdominis Muscle (TRAM) flap with the Vertical Rectus Abdominis Muscle (VRAM) flap, which assumes the form of a “Fleur-de-lys”, and to identify the population of patients reconstructed by this technique followed sacral resection.

METHODS: A retrospective chart review was conducted on patients undergoing oncologic sacral resections followed by Fleur-de-lys myocutaneous flap for soft tissue reconstruction between December 2008 and December 2019. Demographics, clinical and surgical characteristics, postoperative outcomes, and complications were reviewed.

RESULTS: Two patients underwent Fleur-de-lys myocutaneous flap to sacral reconstruction. A 44-year-old male and a 31-year-old female, both patients presented with a locally advanced sacropelvic chordoma requiring en bloc total sacrectomy and rectal resection. The mean tumor size was 2,139 cm³, and the soft tissue defect 13920 cm³. Patients underwent pelvic instrumentation with hardware and fibular grafts (1 patient bilateral free fibula flap; the other allograft fibular bone) for spine and pelvic reconstruction followed by pedicled Fleur-de-lys flap. The posterior abdominal wall was reconstructed in 1 patient with AlloDerm to avoid bowel herniation. One patient developed a minor abdominal wound dehiscence, managed with dressing change, and wound vac. The other patient presented wound infection and minor dehiscence in the abdominal and sacral requiring surgical debridement with successful healing. The mean hospital stay was 74 days (63–85), and the follow-up was 13 months (7–19). One patient expired after 19 months of the initial surgery.

CONCLUSION: The Fleur-de-lys myocutaneous flap obliterates massive soft tissue defects resulted from total sacral resections and avoids the need of other flaps with low morbidity associated.
Targeted Muscle Reinnervation for the Prevention and Treatment of Postamputation Pain and Improvement of Prosthetic Function: A Systematic Review

Presenter: Waverley Y. He, BA

Co-Authors: Amanda L. Chow, BA; Wilmina N. Landford, MD; Jaimie Shores, MD

Affiliation: Johns Hopkins University School of Medicine, Baltimore, MD

PURPOSE: Targeted muscle reinnervation (TMR) is a surgical technique where transected nerves in amputated limbs are redirected to new motor targets. TMR was originally developed to enhance prosthetic control following amputation but has recently also become popular for managing postamputation pain. Standardized outcome measures and time points to evaluate pain and prosthetic function in these patients have not yet been established. We aim to identify and recommend assessment tools used to assess pain and prosthetic function following TMR, as well as to summarize early results.

METHODS: A comprehensive search of literature was conducted using 5 bibliographic databases. Two independent reviewers screened abstracts and full-text articles to select studies describing postamputation pain and/or prosthetic function outcomes of TMR. Methodological quality was appraised using the Newcastle-Ottawa Scale (NOS) and Cochrane Risk of Bias tool (RoB). Studies with duplicate patient populations were identified. Data were extracted including timing of TMR with respect to amputation, location of amputation, and measured pain and/or prosthetic function outcomes. Differences between reviewers were resolved through consensus.

RESULTS: A total of 476 articles were identified, of which 62 were selected for full-text screening and 16 studies were included. Studies from 8 institutions were represented, including 4 cohort studies and 1 randomized controlled trial. Overall, 253 unique patients underwent TMR. One hundred (39.53%) patients were male and 40 (15.81%) were female. Ten studies assessed pain outcomes and 7 described prosthetic function outcomes. Three assessment tools were used to analyze pain: Patient-Reported Outcomes Measurement Information System (PROMIS) in 3 studies, Numerical Rating Scale (n = 2), and Visual Analogue Scale (n = 3). Studies showed decreased prevalence of neuroma pain and phantom limb pain (PLP) following primary TMR compared to amputation only. Prevalence of pain following secondary TMR also decreased postoperatively, although intensity of PLP transiently increased. Primary TMR lead to a greater decrease in PROMIS pain scores compared to amputation only, although there was no significant difference in pain scores following secondary TMR compared to standard neuroma excision treatment. Nine assessment tools were used to evaluate prosthetic function, including box-and-block test (n = 5), clothespin relocation test (n = 4), and amputee mobility predictor (n = 3). Of the 5 studies using box-and-block test, 4 demonstrated improved prosthetic function following TMR.

CONCLUSIONS: Early reports of TMR for the prevention and treatment of postamputation pain are convincing, although the variation in prosthetic training time and scarcity of comparative studies makes it difficult to determine comparative effectiveness for prosthetic function. We recommend that future prospective studies evaluating pain and prosthetic function deploy common assessment tools, such as PROMIS and box-and-block test, at consistent time points.

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