

Versatility of Pedicled Tensor Fascia Lata Flap in Two Different Challenging Anatomical Defects

G. Gopu¹, M. Ramesh², Dr. R. Balasubramaniam³

^{1,2}Professor, Department of Surgical Oncology, Madurai Medical College

³Department of Surgical Oncology, Madurai Medical College

Abstract: *Background:* The tensor fascia lata is a versatile flap with many uses in reconstructive plastic surgery. As a pedicled flap, its reach to the lower abdomen and groin made it an attractive option for reconstructing soft tissue defects after tumour ablation. We present two cases with challenging anatomical reconstruction after tumour ablation using pedicled TFL flap. A pedicled tensor fascia lata (TFL) flap was therefore performed in both cases, which resulted in durable sensate reconstruction with good functional outcomes and no complications. We believe the pedicled TFL flap represents an important option for the reconstruction of oncologic defects that provides well-vascularized and sensate tissue without the need for microsurgical techniques.

Keywords: TFLflap, versatile, reconstruction

1. Introduction

Wangensteen first reported the tensor fascia lata flap for abdominal wall reconstruction. Later, in 1978, Hill et al. and Nahai et al. described it as free musculocutaneous flap¹². Since then it has widely been used for reconstruction of various anatomical regions as pedicled or free flaps. This is a myofasciocutaneous flap that can be used as a pedicled flap for a wide variety of regions including trochanter, groin, perineum, ischium, and lower abdomen that can occur following trauma, infection, orthopaedic intervention, and pressure sores and after resection of malignant lesions/lymph node dissection³.

Due to various features of tensor fascia lata flap, it is considered as a reliable flap for the reconstruction of many challenging defects. In this paper, we present 2 cases of such defects reconstructed with sensate pedicled TFL flaps after tumour resection⁴. The TFL flap has several potential

advantages in this patient population: (1) provision of a large amount of vascularized tissue with an axial blood supply as a pedicled flap, (2) preservation of sensation, and (3) minimal donor site morbidity⁵⁶.

2. Case Report

2.1 Case 1

A fifty year old female underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy two years ago. Now patient has a non healing ulcer on the lateral aspect of the Pfannenstiel incision on left side for one year. Biopsy of the ulcer revealed squamous cell carcinoma. After pre-operative evaluation with CECT abdomen and pelvis, patient was planned for wide local excision with mesh repair followed by tensor fascia lata flap reconstruction. Post operative histopathology showed squamous cell carcinoma with negative margin.



2.2. Case 2

A 65 year old male patient was diagnosed to have recurrent squamous cell carcinoma of right gluteal region. Patient was

planned for wide local excision with tensor fascia lata flap reconstruction. Post-operative histopathology revealed moderate squamous cell carcinoma with resected margin free.



2.3 Anatomy and Surgical Techniques

The anatomy and surgical technique of the TFL flap have been previously well described. In brief, the TFL muscle is a thin, bandlike muscle located in the lateral thigh that functions as an accessory muscle to help flex and abduct the thigh and is expendable for the purposes of soft tissue reconstruction. It originates from the anterior iliac crest, anterior superior iliac spine (ASIS), and greater trochanter, ultimately inserting onto the lateral tibial condyle. The TFL flap receives its dominant blood supply from the lateral circumflex femoral artery (LCFA), which enters the muscle along its deep aspect approximately 7–12 cm distal to the ASIS, and supplies myocutaneous and septocutaneous perforators to the skin⁷. The sensory innervation of the TFL flap consists of the lateral cutaneous branch of T12 that enters the lateral thigh region after crossing the iliac crest approximately 6 cm posterior to the ASIS and by the lateral femoral cutaneous nerve that enters the anterior border of the lateral thigh skin 10 cm distal to the origin of the tensor fasciae lata muscle.

Flap elevation is performed from a lateral decubitus position. The ASIS and lateral tibial condyle are marked, as is a line adjoining these two points, which approximates the anterior border of the TFL. The flap is designed based on the dimensions of the defect, preferably along the proximal two-thirds of the thigh where perfusion is more reliable. Dissection of the flap begins distally, where the TFL is identified and disinserted, and then it is raised from inferior to superior. In the proximal thigh, great care is exercised to identify and preserve the vascular pedicle along the deep aspect of the flap. Further proximal flap and pedicle dissection are performed to adequately mobilize the flap. Sensory innervation to the flap is maintained by preserving both the lateral cutaneous branch of T12 and the lateral femoral cutaneous nerve. The lateral cutaneous branch of

T12 is located subcutaneously 6 cm posterior to the ASIS and is thus proximal relative to flap dissection and is easily maintained during standard harvest. The lateral femoral cutaneous nerve is located subcutaneously 10 cm inferior to the ASIS and can be identified when dissecting through the subcutaneous tissues of the anterior flap incision, where it is identified and mobilized, if necessary. The intervening skin bridge between the donor and recipient sites is divided in order to prevent constriction of the flap beneath a subcutaneous tunnel. In addition, this allows for medial rotation and advancement of the posterior thigh tissues that facilitates donor site closure and also reduces the size of the defect. Closed suction drains are placed, and primary donor site closure can typically be accomplished when the flap is less than 9 cm wide; otherwise split-thickness skin grafting may be necessary.

3. Discussion

Reconstruction of soft tissue defects around lower abdomen and gluteal region remains a challenging task for the oncologic plastic surgeon. These regions often require flap cover due to associated exposure of bones or vessels or other vital structures. The flap can be harvested from local or remote areas. For lower abdominal wall reconstruction, the available options are rectus abdominis muscle flap, tissue expansion, and medial mobilization of abdominal wall muscle. Use of rectus abdominis muscle flap may lead to abdominal weakness or hernia and lateral mobilization of abdominal muscle is difficult to use in the field of surgical oncology and tissue expansion takes a longer time⁸. The tensor fascia lata flap is a reliable flap having good vascularity and composed of skin, subcutaneous tissue, fascia, and muscle. Besides the fact that this muscle is expendable, it causes minimal donor site morbidity without any knee weakness. In first case, we used pedicled tensor fascia lata flap to reconstruct lower abdominal defect. We found no

complication in terms of herniation or abdominal wall weakness. This corresponds to literature as described by some authors who reported that fascia lata is an effective flap that avoids the use of mesh and having a low incidence of recurrent herniation. In our case, we reinforced the abdominal flap defect with prolene mesh followed by TFL flap.

Most prior descriptions of techniques to reconstruct the gluteal region have focused on patients with pressure sores for whom defects are typically located over bony prominences (ischium and sacrum) and for whom there are typically suitable local flap options for soft tissue reconstruction⁹. Patients with gluteal squamous cell carcinoma present a significantly different clinical scenario. In this population, large area of resection often prohibit the use of local flap options. Although in these cases microsurgical reconstruction may be considered, these larger resection also often render the gluteal vessels (the only recipient vessels in proximity) unsuitable for free tissue transfer, thereby necessitating a significantly more complicated procedure involving vein grafts and position changes during surgery. The anterolateral thigh (ALT) flap represents a pedicled option for reconstruction of gluteal defects; however, this is often limited to lateral defects since it is located further from the buttocks than the TFL flap¹⁰. In addition, the TFL flap is more easily harvested from a lateral decubitus position compared to the ALT flap, to allow for simultaneous access to the gluteal defect.

Although the TFL flap has been well described in the reconstruction of trochanteric pressure sores and abdominal wall defects, to our knowledge, it has not been previously described for the reconstruction of gluteal defects due to limitation of lateral arc of rotation. In this case report we describe reconstruction of large gluteal defect following resection with laterally rotated TFL flap even though lateral arc of rotation is the limitation. Reconstruction was successfully achieved with pedicled sensory TFL flaps, with minimal morbidity¹¹

The morbidity of TFL flap lies in thigh scarring which is worse if a skin graft is used especially in females. Problems with the flap's vascularity of its distal part should not be encountered, if the flap is harvested within the safe limits, a proper flap's design is well executed, and the edges are comfortably inserted to the defect.

4. Conclusion

In conclusion, the TFL flap is a versatile flap with minimal donor site morbidity. It can be recommended in lower abdominal wall defect and also gluteal defect instead of free flap in which complex procedure needed because of larger resection. In these extensive anatomical defects can be reconstructed with the pedicled TFL flap, which allows for transfer of a large amount of well-vascularized tissue, as well as primary donor site closure, minimal donor site morbidity, and sensate reconstruction.

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