Content available at: https://www.ipinnovative.com/open-access-journals

IP Journal of Surgery and Allied Sciences

Journal homepage: https://www.jsas.co.in/

Case Report

Anterolateral thigh free flap surgery for medial malleoli fracture with extensive dorsal foot skin defect: A case report

Chandrashekar V Mudgal[1], Krishna Prasad[2], Rajesh B Naik[1]*

[1]*Dept. of Orthopaedics, Karnataka Institute of Medical Sciences, Hubli, Karnataka, India*
[2]*Dept. of Plastic Surgery, Karnataka Institute of Medical Sciences, Hubli, Karnataka, India*

ARTICLE INFO

Article history:
Received 27-07-2024
Accepted 24-08-2024
Available online 14-09-2024

Keywords:
Anterolateral thigh flap
Free flap
Dorsal foot
Vacuum-assisted closure (VAC)

ABSTRACT

Severe foot deformities, especially those affecting the dorsum of the foot, can make it difficult to perform daily activities. For example, mild pain when walking can be felt on the dorsal aspect of the foot, and toe contractures can make it difficult to wear non supportive shoes. Reconstructive surgeons face a great deal of difficulty in providing a suitable flap in accordance with the "like for like" reconstructive principle. The best outcomes for reconstructing small- to medium-sized dorsal foot lesions have been reported using local flaps and pedicled flaps. Reconstruction of large dorsal foot deformities is, however, hardly studied. In this work, we report our experience reconstructing large dorsal foot lesions using the free anterolateral thigh (ALT) flap.

1. Introduction

Lower extremity defects are associated with a lack of local soft tissue and blood supply. This presents difficult issues for surgeons. Reconstruction techniques for lower limb defects include skin grafting, direct closure, and local flaps such as the muscle flap, cross-leg flap, and free flap.[1] One drawback of the local flap is that it restricts movement. In addition to causing patients discomfort as it limits their range of motion, the cross-leg flap has the drawback of necessitating a second procedure in order to isolate the pedicle.[2]

The free flap has the disadvantage of potentially increasing the amount of time needed for the treatment and requiring highly vascularized recipient locations and microsurgical methods. It is beneficial because the flap itself has good vascularity, it is simple to obtain identical tissue, the size of the defect sites essentially has no restrictions on its use, and it can produce satisfactory cosmetic results.[3] According to Pollak et al, even in situations where the reconstruction could be adequately completed with a local flap, a better prognosis would be obtained in reconstruction surgery utilizing a free flap.[4]

2. Case Report

Here is a case of 48-year-old female who had alleged history of road traffic accident, sustained injury to right foot, presented with the wound over the dorsal aspect of foot (Figure 1). X-ray shows medial malleoli fracture with dislocation of fifth proximal interphalangeal joint (Figures 2 and 3). Ultrasound doppler study showed biphasic flow over dorsalis pedis artery, anterior tibial artery, posterior tibial artery.

Patient was posted for surgery for wound debridement (Figure 4) and K-wire application for medial malleoli fracture and dislocation of fifth metatarsophalangeal joint after reduction (Figures 5 and 6). Vacuum assisted Closure

* *Corresponding author*.
E-mail address: rajeshnaik595@gmail.com (R. B. Naik).

https://doi.org/10.18231/j.jsas.2024.020

Figure 1: Clinical picture at the time of presentation in emergency department

(VAC) was done intraoperatively after wound debridement.

Figure 2: Pre-op X-ray showing medial malleoli fracture

On postoperative day 3, patient was posted for anterolateral thigh free flap surgery for defect skin over dorsal aspect of foot (Figures 7 and 8).

Heparin sodium injection 5,000 units in sodium chloride 0.9% was used intra operatively to irrigate the vessels (Figure 9). Postoperatively foot was immobilized with below knee slab and measures were taken to keep body temperature at least 37.6°C (warming blanket, room temperature).

After 6 months of follow-up, flap has taken very well, patient had a good functional outcome (Figures 11 and 12).

Figure 3: Pre-op X-ray showing dislocation of fifth proximal metatarsophalangeal joint

Figure 4: Clinical picture after wound debridement

3. Discussion

The ALT flap usually yields adequate functional recovery and favourable surgical outcomes with high success rates.[5] The flap's developed vascular architecture contributes to its endurance by facilitating effective integration and repair.

The success rate of anterolateral thigh flap transfer is higher than 95%, and the ALT flap has become a workhorse of reconstructive microsurgery with broad indications for reconstructing defects from head to foot.[6]. The advantages of using the ALT flap include:

1. Ease of harvest due to reliable anatomy.
2. Long and large calibre vascular pedicle.[7]

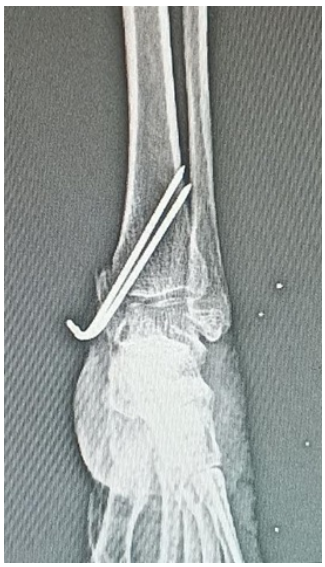

Figure 5: Post-op X-ray showing K-wire application to medial malleoli fracture

Figure 6: Post-op X-ray showing K-wire application to dislocation of fifth proximal metatarsophalangeal joint

Figure 7: Anterolateral free flap donor site (i)

Figure 8: Anterolateral free flap donor site (ii)

Figure 9: Intraoperative clinical picture

3. Versatility in flap modification like flap thinning or harvesting of chimeric flaps, depending on the donor site requirement.
4. Little donor site morbidity.

While complications like infection or partial flap loss are possible, they may be controlled with proper surgical technique and postoperative care.[8] The other complication includes venous and arterial insufficiency, thrombosis, venous congestion, twisting of pedicle, compression of pedicle, tension at flap edges leading to marginal skin necrosis.

4. Conclusion

We discovered that an appropriate treatment option for treating soft tissue abnormalities and forefoot skin damage is the Anterolateral thigh flap.[9] This flap can be utilized to fill traumatic lesions that are small to medium in size and expose bone or tendons. In carefully chosen patients, there

Figure 10: Post-op day 2 clinical picture

Figure 11: 6-month follow-up clinical picture (side view)

Figure 12: 6-month follow-up clinical picture (front view)

was little surgical morbidity at the donor and recipient sites. Long-term benefits in terms of appearance and functionality are also provided by this modified technique.[10] Yet, there is a chance that this flap will result in a vascular crisis, particularly in individuals requiring emergency surgery.

5. Conflict of Interest

None.

References

1. Ferreira MC, Besteiro JM, Jr AAM, Zumiotti A. Reconstruction of the foot with microvascular free flaps. *Microsurgery*. 1994;15(1):33–6.
2. Song YG, Chen GZ, Song YL. The free thigh flap: A new free flap concept based on the septocutaneous artery. *Br J Plast Surg*. 1984;37(2):149–59.
3. Hong JP. Reconstruction of the diabetic foot using the anterolateral thigh perforator flap. *Plast Reconstr Surg*. 2006;117(5):1599–608.
4. Kuo YR, Seng-Feng J, Kuo FM, Liu YT, Lai PW. Versatility of the free anterolateral thigh flap for reconstruction of soft-tissue defects: review of 140 cases. *Ann Plast Surg*. 2002;48(2):161–6.
5. Wei FC, Jain V, Celik N, Chen HC, Chuang DC, Lin CH. Have we found an ideal soft-tissue flap? An experience with 672 anterolateral thigh flaps. *Plast Reconstr Surg*. 2002;109(7):2219–26.
6. Löfstrand JG, Lin CH. Reconstruction of defects in the weight-bearing plantar area using the innervated free medial plantar (instep) flap. *Ann Plast Surg*. 2018;80(3):245–51.
7. Scheufler O, Kalbermatten D, Pierer G. Instep free flap for plantar soft tissue reconstruction: indications and options. *Microsurg*. 2007;27(3):174–80.
8. Hong JP, Kim EK. Sole reconstruction using anterolateral thigh perforator free flaps. *Plast Reconstr Surg*. 2007;119(1):186–93.
9. Pappalardo M, Jeng SF, Sadigh PL, Shih HS. Versatility of the free anterolateral thigh flap in the reconstruction of large defects of the weight-bearing foot: a single-center experience with 20 consecutive cases. *J Reconstr Microsurg*. 2016;32:562–70.
10. Liebau J, Berger A, Pallua N, Dordel HJ. Reconstruction of plantar defects. *Eur J Plast Surg*. 1997;20:300–5.

Author biography

Chandrashekar V Mudgal, Professor

Krishna Prasad, Assistant Professor

Rajesh B Naik, Junior Resident

Cite this article: Mudgal CV, Prasad K, Naik RB. Anterolateral thigh free flap surgery for medial malleoli fracture with extensive dorsal foot skin defect: A case report. *IP J Surg Allied Sci* 2024;6(3):90-93.