ORIGINAL RESEARCH PAPER
Volume-9 | Issue-1 | January-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

# FREE SUPRAFASCIAL ANTEROLATERAL THIGH FLAP FOR RECONSTRUCTION OF LOWER EXTREMITY DEFECTS – A PROSPECTIVE STUDY

Plastic Surgery

**Alagar Raja Durairaj** — Associate Professor, Department of Plastic & Reconstructive Surgery, Saveetha Medical College & Hospital, Thandalam, Kanchipuram Dist. 602105.

**Narayanamurthy Sundaramurthy** — Associate Professor, Department of Plastic & Reconstructive Surgery, Saveetha Medical College & Hospital, Thandalam, Kanchipuram Dist. 602105.

**Surya Rao Rao Venkata Mahipathy*** — Professor & Head, Department of Plastic & Reconstructive Surgery, Saveetha Medical College & Hospital, Thandalam, Kanchipuram Dist. 602105. *Corresponding Author

## ABSTRACT

Free anterolateral thigh (ALT) flap is a versatile and a workhorse flap in the field of reconstructive microsurgery for lower extremity defects. Conventionally, ALT flap is harvested in subfascial plane from lateral aspect of thigh for reconstruction of lower extremity defects. In our unit, we harvested ALT flap in suprafascial plane for lower extremity reconstruction and analyzed the outcome, advantages and disadvantages.

## KEYWORDS

Anterolateral thigh flap, suprafascial, subfascial, lower extremity

## INTRODUCTION:

ALT flap was first described by Song et al in 1984. It was popularized by Koshima et al and Kimata for head and neck reconstruction.(1) ALT is a fasciocutaneous flap based on perforators from descending branch of lateral circumflex femoral artery. Perforators reach the skin either through vastus lateralis muscle as musculocutaneous perforator [60%] or they travel in the septum between vastus lateralis and rectus femoris as septocutaneous perforator [40%].(2) Perforator calibre ranges between 1.5 to 2.5 mm and it is accompanied by two venae comitantes which are larger in caliber ranging between 1.8 to 4mm.(1) ALT flap can be harvested as musculofasciocutaneous flap by inclusion of the vastus lateralis. It can become a sensate flap by including a branch of lateral circumflex femoral nerve.

## MATERIALS AND METHOD:

ALT flaps done for lower limb reconstruction from August 2015 to August 2019 were included in the study. Total number of ALT flaps done over this period was 35, out of which 17 were subfascial and 18 were suprafascial. In the subfascial group, 12 were male patients and 5 were female whereas in the suprafascial group, 14 were male and 3 were female. 31 out of 35 flaps survived. The remaining 4 flaps failed, two in each group. Flap dehiscences were found in three patients in subfascial groups requiring trimming and secondary suturing. There was no flap dehiscence in suprafascial group. Debulking procedures were done for 5 patients in subfascial group, two patients for aesthetic appearance, two for fitting of special footwear and one for restricted mobility of foot. No debulking procedures were done in suprafascial group.

### Surgical technique:

Flap marking is done in a standard pattern by drawing a line between the anterior superior iliac spine and the supero-lateral point of patella. Midpoint of the above line is marked after measuring the distance between the above two bony landmarks. A circle of 3cm radius is drawn around the midpoint and divided into four quadrants. Perforator is traced within the circle using hand Doppler and it is usually found in the lower outer quadrant .Flap of required dimension is marked and centered over the identified perforator point.(2,3) Flap is harvested in suprafascial or Scarpa's fascial plane to get a thin flap. Meticulous sharp dissection is done to maintain the suprafascial plane and to identify the perforator. Once the perforator is identified, it is dissected carefully through the crural fascia. To avoid damage to the pedicle usually a thin cuff of crural fascia is taken along with the pedicle. Then the dissection is continued through vastus lateralis muscle or through the septum depending on the type of perforator. The pedicle can be dissected up to the origin of the descending branch to get adequate length. (Fig. 1 & 2)

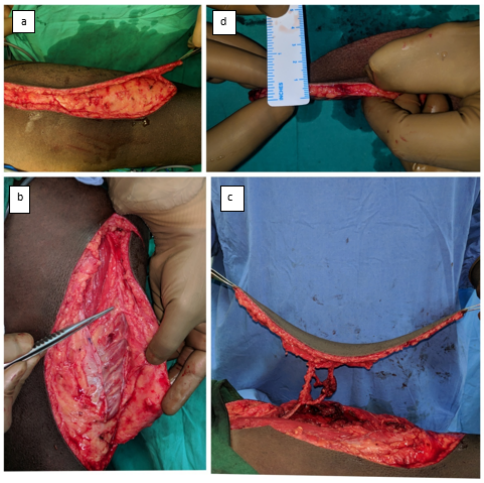


**Fig. 1 – Pictures showing harvesting the flap (a), the dissection through Scarpa's fascia (b), the pedicle with perforator (c) and the thin suprafascial flap (d)**

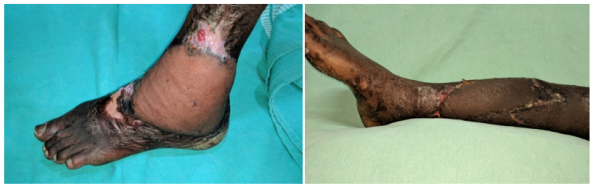

**Fig. 2 – Suprafascial ALT flap results with good contour and aesthetic appearance**

## RESULTS:

No significant difference was found in flap survival and necrosis between the both the groups. Flap necrosis can be attributed to factors like vessel calibre, flow properties and other factors like diabetes, wound bed condition, associated injuries and compromised general condition of the patient. Differences were noted in flap dehiscence, which required secondary suturing in the subfascial group. Also subsequent debulking procedures were done in the subfascial ALT flaps to improve function and aesthetic appearance. Suprafascial ALT flaps neither had dehiscence nor required debulking procedures.

## DISCUSSION:

Free ALT flap is an easier and safer flap to harvest because of its reliable vascularity, good calibre vessels and adequate pedicle length.

Robust vascularity allows harvest of larger dimension flap of up to 25cm. Flap dimension of 12 cm or less can be closed primarily whereas larger flap require skin grafting of donor site.(2) Defects of the lower extremity are mostly shallow. Subfascial ALT flaps are often bulky for the lower limb defects. (Fig. 3)

**Fig. 3 – Subfascial ALT flap harvest and the post op picture showing a bulky flap**

Flap dehiscence at the recipient site is quite common with bulky subfsacial flaps. Hence bulky flaps require subsequent debulking procedures to give good contour and to avoid flap dehiscence.(4,5) Suprafascial ALT flap is thin, giving a good contour to the covered defect at the first sitting itself avoiding subsequent debulking procedures. Thin suprafascial flaps are more pliable compared to the subfascial flaps.(6) When applied across the joints suprafascial flaps prevents restriction of joint mobility which is common with the bulky subfascial flaps. Fitting the reconstructed limb with prosthesis or special foot wear becomes easy and less cumbersome with suprafascial flaps when compared with bulky subfascial flaps.(4) Since the fascia is retained at the donor site, muscle herniation can be prevented at the donor site. Retaining the fascia also allows better graft take if the donor site is skin grafted and provides smooth gliding surface for the muscle function.(7,8) In the subfascial group when the graft is applied directly over the muscle, it may cause adhesion impairing smooth gliding of the muscle. In addition to the above advantages thin suprafascial ALT flaps adds value to the aesthetic outcome of the reconstructed area.(4) The only disadvantage with suprafascial ALT flap is that it requires meticulous dissection technique to harvest the flap in the Scarpa's fascial plane, which may be time consuming in the initial stages till the learning curve is crossed .

## CONCLUSION:

ALT flaps can be routinely harvested in the suprafascial plane for lower limb defects as it is well contoured, more pliable with fewer complications, improving the functional and aesthetic outcome of the reconstructed part. Fascia can be included with ALT flap only if warranted.

## REFERENCES:


1. Koshima I, Fukuda H, Utunomiya R, Soeda S: The anterolateral thigh flap; variations in its vascular pedicle. Br J Plast Surg 42:260, 1989.
2. Pribaz JJ, Orgill DP, Epstein MD, Sampson CE, Hergrueter CA: Anterolateral thigh free flap. Ann Plast Surg 34:585, 1995.
3. Microsurgical Reconstruction of the Lower Extremity. William C. Pederson, Luke Grome. Seminars in Plastic Surgery 2019; 33(01): 054-058
4. Suprafascial versus traditional harvesting technique for free anterolateral thigh flap : A case control study to assess the best functional and aesthetic outcome in extremity recinstruction .MARUCCIA M et al. Microsurgery. 2017 Nov; 37(8): 851-857.
5. Outcomes of subfascial, suprafascial and super thin anterolateral thigh flaps: tailoring thickness without added morbidity. Diamond S et al. J Reconstr Microsurg. 2018 Mar; 34(3): 176-184.
6. Super thin and suprafascial anterolateral thigh flap perforator flaps for extremity reconstruction Seth AK, et al. J Reconstr Microsurg. 2017 Sep; 33(7): 466-473.
7. Suprafascial anterolateral thigh flap harvest. A better way to minimize donor site morbidity in head and neck reconstruction. Chen,yen-chou M.D. Plastic and Reconstructive Surgery. Plast Reconstr Surg. 2016 Sep; 138(3): 689-98.
8. Suprafascial anterolateral thigh flap dissection: Limits and advantages. Agostini, Tommaso M.D.; Perello, Raffaella M.D.; Spinelli Giuseppe M.D. Plast Reconstr Surg. 2017 Mar; 139(3): 809e-810e.