

Lateral Calcaneal Flap - A Saviour to Achilles Tendon

Dr. Shyam Gupta^{1*}, Dr. Ankit Gupta²

Ms, Mch Plastic Surgery PGIMER, Dr RML Hospital, Delhi, India

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***Corresponding author**

Dr. Shyam Gupta

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Abstract: Achilles tendon injury is frequent occurrence in road traffic accident which creates a prolonged bed ridden situation if not managed properly. Distal one-third of limb is a soft tissue scanty area housing only the tendinous structures which makes healing a bit difficult in this area. Lateral calcaneal artery based fasciocutaneous flap is an axial flap which can be used as a tool to provide soft tissue cover to repaired or exposed tendoachilles in the acute or chronic setting to speed up the healing process and shorten the morbidity. We studied a series of 5 patients which showed 100% healing rate with no complications.

Keywords: Tendoachilles, Lateral calcaneal artery fasciocutaneous flap, distal leg.

INTRODUCTION

Tendoachilles is the strongest tendon of the body and so the name (Achilles: The warrior in fight of troy). Exposure of tendoachilles in road traffic accidents (RTA), accidental lacerations, avulsions is common presentation in emergency department. Since the lower one- third of leg has scanty soft tissue as compared to the rest of lower limb, it poses a healing problem once ruptured or exposed leading to increased morbidity and prolonged absence from work. There was a constant need to devise vascular soft tissue cover for this area. We are presenting a case series of 5 patients where coverage of exposed tendoachilles done by lateral calcaneal artery based fasciocutaneous flap. It is a sturdy and easy to do flap with minimal training and can be done at basic setup with certain results especially by podiatrician or orthopedician who don't have exposure to microvascular training.

MATERIALS AND METHODS

It is a prospective observational study

5 patients were treated with exposed tendoachilles during a period of 3 months in PGIMER, DR RML hospital, Delhi. All patients were presented within 5-20 days of injury with exposed tendoachilles. Patients with peripheral vascular disease, angiopathy or other vascular diseases were excluded from the study.

Pre-operatively arterial course was marked with the help of hand held Doppler. Intraoperatively, under local anaesthesia debridement was done and defect measured, flap designed and planning in reverse done to avoid any mismatch in flap size. Flap inset done and donor site grafted with split thickness skin graft and fixed with bolster sutures. Limb kept immobilized for 5 days in slab and flap monitoring done via its marginal colour and dermal bleeding pattern. Patient discharged on 6th day after first dressing and followed up on 10th, 21st day and then at 3 month.

RESULTS

5 patients were treated with debridement and cover with lateral calcaneal arterial flap with split

thickness skin graft at the donor site under local anaesthesia.

Male female ratio = 3:2.

Mode of injury in all patients was road traffic accident.

Age ranging from 18-60 years. Patient presented from 5-20 days of injury.

All flaps healed well and graft taken well.

DISCUSSION

In the era of automobile controlling speed is a difficult task for the younger generation inspite of laws enforcement. As a result road traffic accident is common in India and world. Lower extremity trauma is a frequent presentation in poly trauma patients. Among all the trauma lower one-third of leg deserves special mention as it is having scanty of soft tissue padding over a number of tendons passing and minimal or no muscle mass. All these things pose the risk of non-healing, infection, or exposure of vital structures of support for locomotion of distal one- third of limb. We studied the benefits of early cover by lateral calcaneal

artery based fasciocutaneous flap for exposed tendoachilles for rapid healing and speedy recovery as compared to other conservative methods of dressing.

There are other authors who have described this good cover [1, 2].

Table-1: No post-operative complications noted except for small patches of graft non-take which were healed with conservative measures

SL no	Age / sex	Day of presentation after injury	Flap outcome	Graft take	complication
1.	25/m	15	Well healed	100%	No
2.	43/f	5	Well healed	95%	No
3.	45/m	20	Well healed	92%	No
4.	60/m	20	Well healed	85%	No
5.	18/f	18	Well healed	100%	no

Various flaps available are reverse sural flap, peroneus brevis muscle flap, lateral supramalleolar flap, free flap etc[3-6].

Lateral calcaneal flap is of two types -

- 1- Short type(only vertical component)- see in figure 1.
- 2- Long type (vertical and horizontal component)- see in figure 2
- 3-

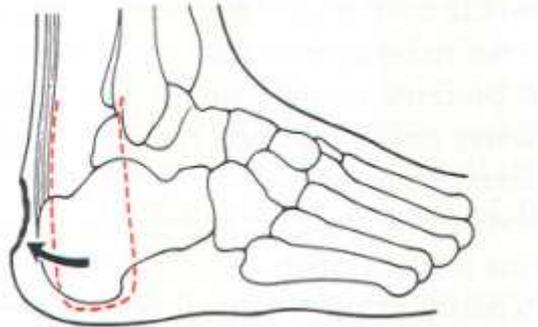


Fig-1: short type

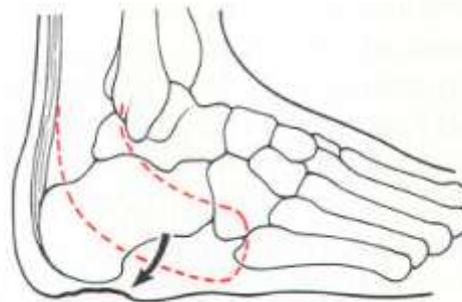


Fig-2: long type

ANATOMY AND DESIGN OF FLAP

Lateral calcaneal neurovascular bundle has a reliable and constant course defined [7]. The base of flap lies approximately 1cm above the maximum convexity of lateral malleolus and extends from the lateral edge of the achilles tendon to the back of lateral malleolus (base dimensions approx 3-4 cm). The flap extends vertically downwards approx 8 cm reaches the lateral edge of plantar surface but does not encroach on the weight bearing area. In long type, the flap curves anteriorly towards the fifth metatarsal base tuberosity.

Depth of dissection is deep to subcutaneous tissue as pedicle lies in subcutaneous tissue which need not to be visualized.

As shown in results all the flaps healed well and graft taken well. All the flaps were sensate so posing no difficulty in wearing shoes. Donor site depression and dog ear due to transposition of flap was a constant finding but no patient mentioned dissatisfaction. There are chances of graft loss if the

peritenon is not left intact over the tendons of the donor site.



Case-1: A- long flap type



B-3 month follow up pic (dog ear present)

Case 2



Fig-A: Pre-operative defect



Fig-B: Marking of flap (short flap type)



Fig-C: Early post op showing healthy flap margins and graft take



Fig-D: 3 month follow up showing excellent graft take

CONCLUSION

Posterior heel defect resulting into delayed healing of tendoachilles is not an uncommon occurrence due to scanty soft tissue padding. Lateral calcaneal artery based fasciocutaneous flap is an easy and certain option for cover if performed correctly as described and speeds up the healing and early return to function. We recommend lateral calcaneal artery flap as a must to do flap or flap of choice for posterior heel defects.

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