



**A STUDY ON THE UTILITY OF PEDICLED MEDIAL HEMISOLEUS MUSCLE FLAP IN LOWER LIMB SALVAGE IN A TERTIARY CARE HOSPITAL**

**Pritha Rakshit\***

Consultant Plastic Surgeon, Apollo Multispeciality Hospitals Limited, Kolkata, India. \*Corresponding Author

**ABSTRACT**

**Background:** Road traffic accidents are a major public health problem in India, and patients with middle third and lower third compound tibial fractures present a particularly difficult surgical challenge due to the difficulty in achieving soft-tissue coverage of the bone in this area. The use of local pedicled flaps for coverage is one option for treatment in patients who are not willing or fit enough to undergo free tissue transfer. We have used the Medial Hemi-Soleus Muscle Flap, both proximally and distally based, to achieve coverage of these difficult soft tissue defects, thereby reducing the risk of osteomyelitis, protracted hospital stay and early mobilization. **Study design:** Prospective, interventional, institution based, conducted at Apollo Multispeciality Hospitals, Kolkata, India. **Method:** Our study includes 10 patients operated over a period of 1 year; all patients underwent wound coverage with medial hemisoleus muscle flap; 6 proximally based and 4 distally based, and were followed up for 1 year, without any significant complications. **Conclusion:** Hemisoleus muscle flap is a reliable flap with robust vascular supply to cover the lower and middle 1/3rd leg defects.

**KEYWORDS :** exposed tibia, proximally based, distally based, medial hemisoleus muscle.

**INTRODUCTION**

Fractures of the lower limb caused by road traffic accidents often pose problems due to the use of implant materials. The intensity of the trauma, the degree of contamination, and the associated soft tissue defects represent negative prognostic factors, which must be taken into account to avoid the structural, septic, and functional complications. The tibial shaft is narrowest at the junction of its middle and inferior thirds, which is the most frequent site of fracture. Unfortunately, this area of the bone also has the poorest blood supply and the anteromedial portion of the tibia is covered by skin and subcutaneous fat only. These factors lead to many instances of bone exposure and delayed healing which require specialized soft-tissue coverage [1,2,3]. A local muscle flap such as the medial hemisoleus is very convenient.

If a local fasciocutaneous flap is not feasible or desired, the distally based medial hemisoleus flap is a common reliable alternative for reconstruction of distal third leg defects of small to moderate size. In the present series, relatively larger defects were successfully reconstructed using this flap. Intraoperative confirmation of the viability of the flap pedicle increases the rate of flap survival. Moreover, the muscle bulk recruited during flap harvest is well contoured for tibial coverage, providing added aesthetic benefit for these injuries [4].

**METHODOLOGY:**

This prospective, interventional, institution based study was conducted at Apollo Multispeciality Hospitals, Kolkata, and included 10 patients with exposed tibia in the middle and lower third, in the age group of 20-70 years, operated over a period of 1 year – during January 2021 to December 2021 and were followed up for 1 year without any serious complications. In 6 cases, a proximally-based hemisoleus flap was used, and rest 4 were covered by a distally based medial hemisoleus muscle flap followed by split skin graft. All patients were recorded for flap failure, early and late postoperative complications, and long-term ambulatory status.

**RESULTS**

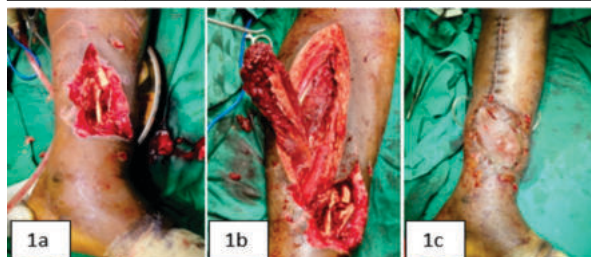
Six of the patients studied had defects in the middle third of their leg. Four patients had defects over the lower third of the leg. All the flaps survived well, only one patient developed partial skin graft loss and achieved complete healing by regular dressings. No donor site morbidity was observed, except minimal depression in the posterior leg.

Long term follow up demonstrated 7 patients ambulating independently after an average of 6 months, with the

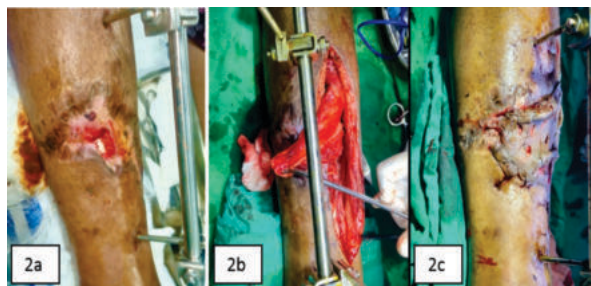
remainder needing a walking assistance with walker or crutches.

**Table 1 – General Details**

SERIAL NO	AGE IN YEARS	SEX	SOFT TISSUE COVERAGE	COMPLICATIONS
1	22	M	MIDDLE 1/3	NIL
2	25	M	LOWER 1/3	NIL
3	38	M	MIDDLE 1/3	NIL
4	42	F	LOWER 1/3	PARTIAL SKIN GRAFT LOSS
5	35	M	MIDDLE 1/3	NIL
6	26	M	MIDDLE 1/3	NIL
7	28	M	LOWER 1/3	NIL
8	51	M	MIDDLE 1/3	NIL
9	47	M	LOWER 1/3	NIL
10	65	M	MIDDLE 1/3	NIL



**Figure 1a** – defect in lower 1/3rd tibia, **1b** – distally based medial hemisoleus muscle harvest, **1c** – after flap inset and split skin grafting.



**Figure 2a** – defect in middle 1/3rd tibia, **2b** – proximally based medial hemisoleus muscle harvest, **2c** – after flap inset and split skin grafting.

**CONCLUSION**

Both the versions of the medial hemisoleus flap – proximally

based and distally based are highly suitable for the treatment of complex middle and lower leg defects due to a high degree of reliability, versatility, minimal donor site morbidity, less operating time, low cost and good functional gain. As surgeons consider the reconstructive ladder for lower extremity trauma, a pedicled soleus muscle flap might be a more suitable option in certain patients and should not be overlooked in the modern era of microvascular reconstruction.

#### REFERENCES

- [1] Sinnatamby CS. *Last's anatomy regional and applied*, Vol. 145-6. Philadelphia: Elsevier, 2006, 176.
- [2] Moore KL, Dalley AR, Agur AM. *Clinically oriented anatomy*, Vol. 520-2. Baltimore: Lippincott Williams & Wilkins, 2010, 527.
- [3] Thorne CH, Chung KC, Gosain AK, Gurtner GC, Mehrara BJ, Rubin JP, et al.. *Grabb and smith's plastic surgery*, Vol. 942. Philadelphia: Lippincott Williams & Wilkins, 2014.
- [4] Song P, Pu LLQ. The Soleus Muscle Flap: An overview of its clinical applications for lower extremity reconstruction. *Ann Plast Surg* 2018; 81: S10916.