OPEN ACCESS

GAVIN PUBLISHERS

Journal of Orthopedic Research and Therapy

Al Lahham S, et al. J Orthop Ther: JORT-1115.

Case Report

DOI: 10.29011/2575-8241. 001115

Salvageable Coverage of Ankle Defects Using Peroneus Brevis Flap

Salim Al Lahham[1,2*], Ahmed Mofeed Mokhallalati[1], Ruba Sada[1], Rehan Zahid[1], Mutaz Abuelgasim[1], Shiyas Mohammedali[1], Sohail Quazi[1], Ahmad Al-Qahtani[1], Talal Al Hetmi[1]

[1]Plastic Surgeon, Hamad Medical Corporation, Doha, Qatar

[2]Fellowship in Microsurgery, Ganga Hospital, Tamil Nadu, India

[*]**Corresponding author:** Salim Al Lahham, Fellowship in Microsurgery, Ganga hospital, No. 313, Mettupalayam Road, Saibaba Koil, Coimbatore, Tamil Nadu 641043, India. Plastic Surgeon, HMC, Qatar. Tel: +9197430197754; Email: sal_lah@hotmail.com

Citation: Al Lahham S, Mokhallalati AM, Sada R, Zahid R, Abuelgasim M, et al. (2018) Salvageable Coverage of Ankle Defects Using Peroneus Brevis Flap. J Orthop Ther: JORT-1115. DOI: 10.29011/2575-8241. 001115

Received Date: 05 September, 2018; **Accepted Date:** 07 September, 2018; **Published Date:** 13 September, 2018

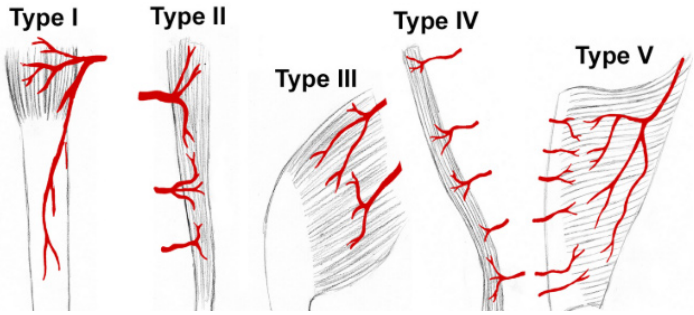
Abstract

The unique anatomical features of the lower third of the leg make coverage of ankle defects a great challenge for the plastic surgeon, especially in cases of severe trauma. Ankle defects can result from trauma, oncologic resection procedures or as complication of postop orthopedic surgeries. The lack of excess skin, or big muscle bellies as well as the poor vascular status of the lower leg make the area humble as a donor area. Then only few loco-regional flaps are available to cover ankle defects. The advances made in microsurgery has made the free flap a good reconstructive option based on a suitable recipient vessel. In cases of severe trauma, there is great possibility of multiple main vessels injury which might limit the option of free flap [1,2]. We report a case of triple vessel injury at ankle level with anterior defect which was managed with peroneus brevis muscle flap [3].

Discussion

➢ Anatomical considerations

- The blood supply of the foot comes from three arteries at the level of ankle: the peroneal,posterior tibial and anterior tibial arteries.
- One intact vessel is enough to provide adequate vascularity to the foot.
- Peroneous brevis muscle is classified as type 2 flap and sometimes type 4 according to Mathes& Nahai classification (Figure 1).



- The main blood supply of the muscle comes from the peroneal artery which gives many muscular branches to the muscle.
- The muscle is located in the lateral leg compartment deep to peronus longus. It originates from the middle and lower third of fibula and got inserted in the base of the 5th metatarsal bone.
- It is innervated by superficial peroneal nerve.
- The muscle can be used as proximally based or distally based muscle flap.
- The distally based flap has the ability to reach the heel and both malleoli and can cover defects with 4 cm width [4,5]

We report a case of RTA, in which a 30-year-old male worker has got severe trauma to his left lower limb. The trauma caused triple vessel injury at the level of distal leg and ankle. The patient underwent urgent revascularization of the foot with repair of anterior Tibial artery. Intraoperative, the posterior Tibial artery and Peroneal artery were badly crushed as reported by the vascular surgeons. After the successful revascularization, there was raw area involving the anterior aspect of the ankle with exposed anastomosis site which required adequate soft tissue coverage (Figure 2,3).

Figure 1: Raw area of the left ankle.

Figure 2: Exposed tendons and eschar covering the vascular anastomosis site.

Since the patient had only anterior tibial artery to perfuse the leg then then any flap based on this vessel is better to be avoided. Our plan was to utilize a muscle flap based on Peroneal or posterior Tibial artery And as the posterior Tibial artery was crushed along its distal third in the leg, our plan was to use muscle flap distally based on peroneal artery for the coverage of the defect. We used distally based peroneus brevis muscle flap.

Operative Details

- The knee is flexed at 90 degrees
- The head of fibula and lateral malleolus are marked
- A line connecting the previous land marks outlines the lateral compartment
- An incision is made along that line in the middle third of the leg and the muscle is identified deeper to peroneus longus.
- The superficial peroneal nerve is identified during the procedure and only branches to the peroneus brevis muscle are sacrificed
- The muscle is elevated from its fibular origin in a proximal to distal direction, and the 6 cm distance from lateral malleolus is preserved and not dissected to maintain well perfusion for the muscle.
- Then the muscle is flipped over the defect and skin grafted
- The donor is primarily closed with one P-Vac, which is removed usually within 24-48 hours.
- Postop care is done with leg elevation over a pillow and first dressing change is done on the 3rd postop day [6,7].

And the patient was discharged one week postop with excellent wound condition (Figure 4,5).

Figure 4: Showing the peroneus muscle flap elevated.

Figure 5: The muscle flap is covering the defect and ready for skin grafting.

Conclusion

Distally based Peroneus brevis muscle flap is an excellent option to cover exposed bone, tendons and vessels at the distal leg and ankle level. The usage of this muscle does not cause any clear motor deficit. The procedure is relatively quick and effective.

References

1. Wettstein R, Schürch R, Banic A, Erni D, Harder Y (2008) Review of 197 consecutive free flap reconstructions in the lower extremity. J Plast Reconstr Aesthet Surg 61: 772-776.
2. Rudig LL, Gercek E, Hessmann MH, Müller LP (2008) [The distally based sural neurocutaneous island flap for coverage of soft-tissue defects on the distal lower leg, ankle and heel]. Oper Orthop Traumatol 20: 252-261.
3. Thornton BP, Rosenblum WJ, Pu LL (2005) Reconstruction of limited soft-tissue defect with open tibial fracture in the distal third of the leg: a cost and outcome study. Ann Plast Surg 54: 276-280.
4. Fraccalvieri M, Bogetti P, Verna G, Carlucci S, Fava R, et al. (2008) Distally based fasciocutaneous sural flap for foot reconstruction: a retrospective review of 10 years' experience. Foot Ankle Int 29: 191-198.
5. McHenry TP, Early JS, Schacherer TG (2001) Peroneus brevis rotation flap: anatomic considerations and clinical experience. J Trauma 50: 922-926.
6. Bach AD, Leffler M, Kneser U, Kopp J, Horch RE (2007) The versatility of the distally based peroneus brevis muscle flap in reconstructive surgery of the foot and lower leg. Ann Plast Surg 58: 397-404.
7. Barr ST, Rowley JM, O'Neill PJ, Barillo DJ, Paulsen SM (2002) How reliable is the distally based peroneus brevis muscle flap? Plast Reconstr Surg 110: 360-362.