



EFFECTIVE USE OF A PROXIMAL PERONEAL PERFORATOR IN VASCULAR AUGMENTATION AND DESIGN ALTERATION OF A REVERSE SURAL FLAP IN SOFT TISSUE COVERAGE OVER A RECONSTRUCTED TENDO ACHILLES

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ABSTRACT

Primary closure of wound over a reconstructed tendo achilles may not be possible always and might need a flap cover. The reverse sural flap has emerged as first choice flap owing to its versatile characters. But a common complication of the reverse sural flap is venous congestion resulting in tip or partial loss of the skin paddle. Therefore it is prudent to include additional perforators at the base of the skin paddle to avoid venous congestion. In this case report, a robust peroneal septo cutaneous perforator was noted in the mid leg while harvesting a reverse sural flap to cover a reconstructed tendo achilles and the perforator was included in the distal part of the skin paddle of the flap thus augmenting the vascular supply of the reverse sural flap. Inclusion of an additional vascular supply enabled us to alter the skin paddle design from conventional peninsular flap to an islanded one which just advanced over the repaired achilles thus enabling a cosmetically and functionally excellent coverage.

KEYWORDS : Reverse Sural Flap; Vascular Augmentation; Peroneal Perforator; Tendo Achilles; Distal Leg Defect

INTRODUCTION

The reverse sural flap is a work horse flap in lower limb reconstruction^[1] and is known for venous congestion, partial or total necrosis.^[1,2,3] Therefore the conventional wisdom is to include additional perforators at the base of the flap in addition to its own which is located midway between the tendo achilles and the lateral malleolus so as to avoid venous congestion. Application of the reverse sural flap to cover a reconstructed achilles tendon^[4] is an established procedure and it involves the application of the flap as a peninsular fasciocutaneous flap or as an islanded fasciocutaneous paddle with adipofascial pedicle. In either case, the vascularity of the flap comes from its base in a retrograde manner and therefore there is always a possibility of venous insufficiency and flap loss. Therefore it is prudent to include additional perforators so as to augment the vascularity, in particular, the venous drainage at its base.^[5,6] In this case, the additional perforator was added at the distal end of the skin paddle rather than at the base.

Case Report

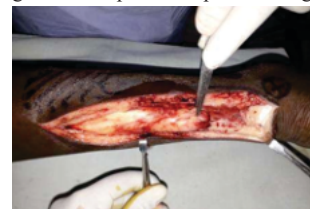
A 19 years old male presented with an unstable gait and a transverse scar over the right distal tendo achilles region.



He gave a history of cut injury six weeks before and was sutured elsewhere. On palpation, there was a step deformity and tenderness over the region, thus confirming the rupture of tendo achilles. He was planned for reconstruction of the ruptured achilles using proximal flip over flap technique and coverage with reverse sural flap as the scar was unyielding for a tension free closure. Therefore, marking was made for reverse sural flap and medial flap incision was used to approach the ruptured achilles.



The proximal and distal cut ends of the achilles tendon were identified and repaired using the central part of the proximal segment.



The reverse sural flap was raised along with the underlying fascia, lesser saphenous vein and sural nerve from the medial incision. The proximal incision was made and the proximal ends of the sural nerve and lesser saphenous vein were ligated and divided. While elevating the flap on the lateral side, a robust perforator was found entering the flap from the peroneus brevis muscle and was found traversing through its substance.



The perforator was traced for certain distance but not till its source as the flap was almost near completely raised. But a decision was made to preserve this perforator and the flap elevation was completed. Initial attempts to cover the repaired achilles with the flap created some traction and therefore a decision was made to convert the peninsular skin paddle in to an islanded paddle with the preservation of the proximal perforator. Once the skin paddle was islanded, the flap moved without any tension over the reconstructed achilles.



The additional perforator which was marked earlier at the flap base was smaller than the proximal perforator and therefore it was cauterized with bipolar diathermy. The flap was given inset and the flap donor site was covered with skin graft.



Post operatively, non weight bearing ambulation was started on third day and he was maintained on anterior plaster slab for six weeks and later full weight bearing ambulation was enabled. Minor areas of skin graft loss were seen, which healed with conservative management.

DISCUSSION

In spite of being one of the most sought after flaps in lower limb reconstruction, especially in the distal leg, foot and ankle region, the perennial problems with the reverse sural flap are venous congestion and flap necrosis.^[7] Remedial measures to save the flap are; supercharging the lesser saphenous vein at the recipient site, avoiding tunneling of the pedicle, inclusion of an additional perforator at the base and harvesting the flap with a wide base pedicle. Leech therapy and intermittent bleeding of the lesser saphenous vein at the recipient area are the other measures but are less practiced.^[2,3] The perforator plus flap concept^[5,6] implies the presence of a known or unknown perforator at the base of a fasciocutaneous flap and its presence is confirmed with a hand doppler. It provides an additional vascular source and in an islanded flap it enables good flap movement with a greater arc of rotation. So our case differs from perforator plus concept as we added a perforator at the distal end of the skin paddle rather than from the base.

Proximal peroneal artery perforators are reliable vascular pedicles and their use is well documented^[8,9] in the reconstruction of proximal and mid leg defects. They can be septocutaneous or musculocutaneous and can be used both as pedicled or free flaps. In our case, the chance finding of a good proximal peroneal perforator which was of septo cutaneous type enabled us to include it in the flap as an additional vascular supply and modify the design from the conventional peninsular flap to an islanded advancement flap based on two vascular sources, one proximal [Peroneal perforator] and one distal [Regular pedicle of the RSA flap]. The end result was an excellent soft tissue coverage to the reconstructed tendo achilles and cosmetically acceptable scar at the surgical site.

CONCLUSION

To conclude, it is always safer to include additional perforators to the reverse sural flap to avoid venous congestion and flap loss. This case was unique because the additional source of vascular supply came from a proximal perforator rather than a distal perforator.

Declaration of Patient Consent

Ethical approval is not required as it is a case study. The authors confirm that they have taken the necessary consent forms from the patient. The patient was clarified that his / her face, name or any other personal details of identification will not be revealed in the photographs and is intended purely for educational purposes only and has accepted and consented.

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