MedStar Georgetown University Hospital

Saphenous Artery Perforator Flap for Coverage About the Proximolateral Leg: A Case Report

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ABSTRACT

The saphenous artery perforator (SAP) flap is historically used for coverage of orthopedic soft tissue defects about the knee and proximal leg. This flap based from the descending genicular artery provides robust circulation and generous coverage to the recipient region. This is an infrequently cited solution to a challenging problem, and should be regarded as a valuable limb salvage tool in the foot and ankle surgeon's armamentarium. The purpose of this review and case report was to provide a detailed review and descriptor of a unique case of local transpositional saphenous artery perforator flap about the proximolateral leg.

LITERATURE REVIEW

The Saphenous Artery arises as one of three branches of the Descending Genicular Artery. In this area of the lower extremity the vascular supply is robust and orients in predictable branching patterns. Three types of branching occur, depending on whether all 3 branches shared a common origin (60%); one of the branches has an isolated origin (30%); or all 3 branches have isolated origins (10%)[1].

Lee et al[2] found the average length of the saphenous artery was 14.8 cm, located 12cm above the medial epicondyle with an average diameter of 1.63 mm. A median average of 4 saphenous perforators branched from a single saphenous artery with 2 septocutaneous perforators and 2 musculocutaneous perforators located at ~7.0 cm proximal to the medial epicondyle.

Nenad et al[3] retrospectively analyzed 50 patients for a mean of 4 years following distally based saphenous neurofasciocutaneous perforator flaps and found 70% success rate at that time. They identified 3 variables that impacted flap failure rates: the number of previous reconstructive operations, the identity of the performing surgeon, and the area of the primary defect.

Lin et al[5] saw successful reconstruction of 5 patients for soft tissue defects about the knee and proximal 1/3 of the tibia with saphenous perforator flap.

CASE REPORT

We present the case report of a 49 year old Female status post local transpositional SAP flap for definitive defect closure about the proximolateral leg. The patient originally presented with a chronically recalcitrant anterolateral proximal leg wound which was managed with local wound care for several months. Vascular and Rheumatological work-ups revealed no underlying pathology.

Soft tissue debridement to the level of crural fascia with optimization of vascular perfusion and supplementation of a local rotational saphenous artery perforator flap was performed. Following a period of post-operative immobilization, the patient underwent split-thickness skin grafting to the donor site and subsequently returned to independent ambulation with maintenance of soft tissue integrity for the duration of 12 month follow-up.

FIGURE 1: Chronic recalcitrant wound of the proximal 1/3 of the anterolateral tibia. Vascular and Rhematology work ups revealed no underlying pathology.

FIGURE 2: Soft tissue debridement was carried into the level of the crural fascia. Staged debridement was utilzed with supplementary use of negative pressure wound therapy.

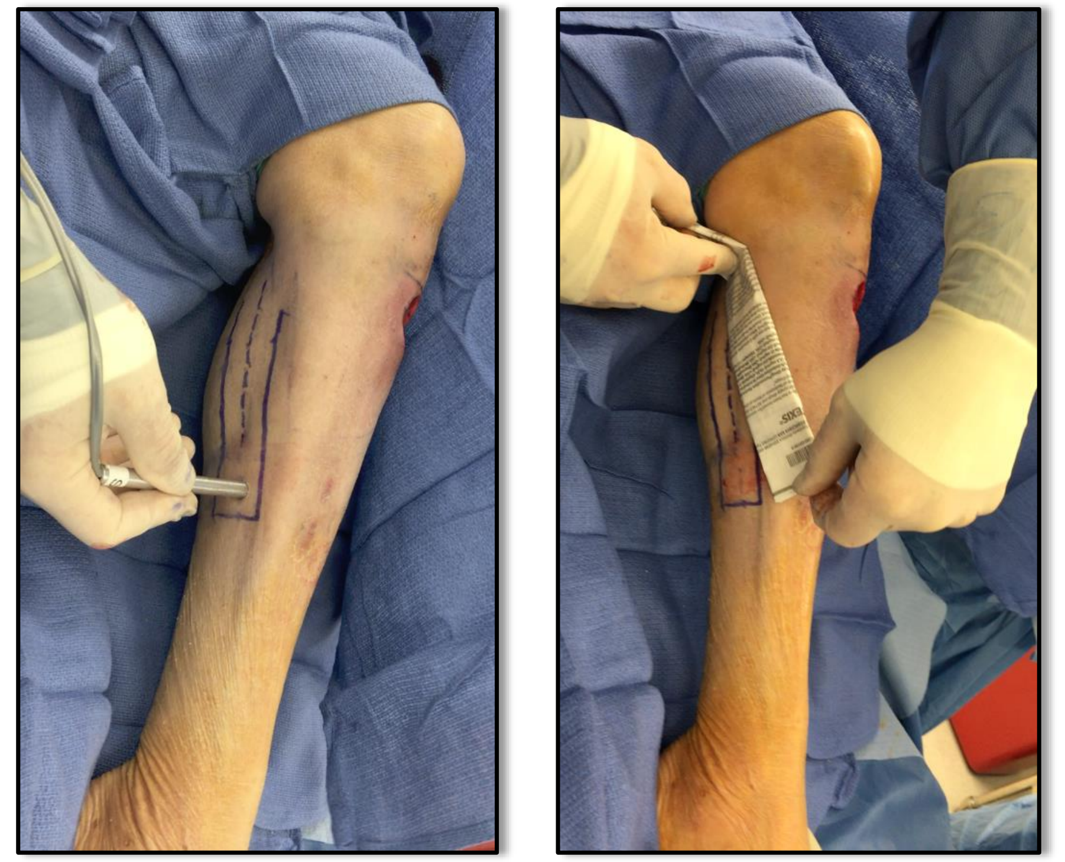

FIGURE 3: Flap planning was confirmed with intraoperative arterial doppler tracing. Rotational axis and length was confirmed with paper template

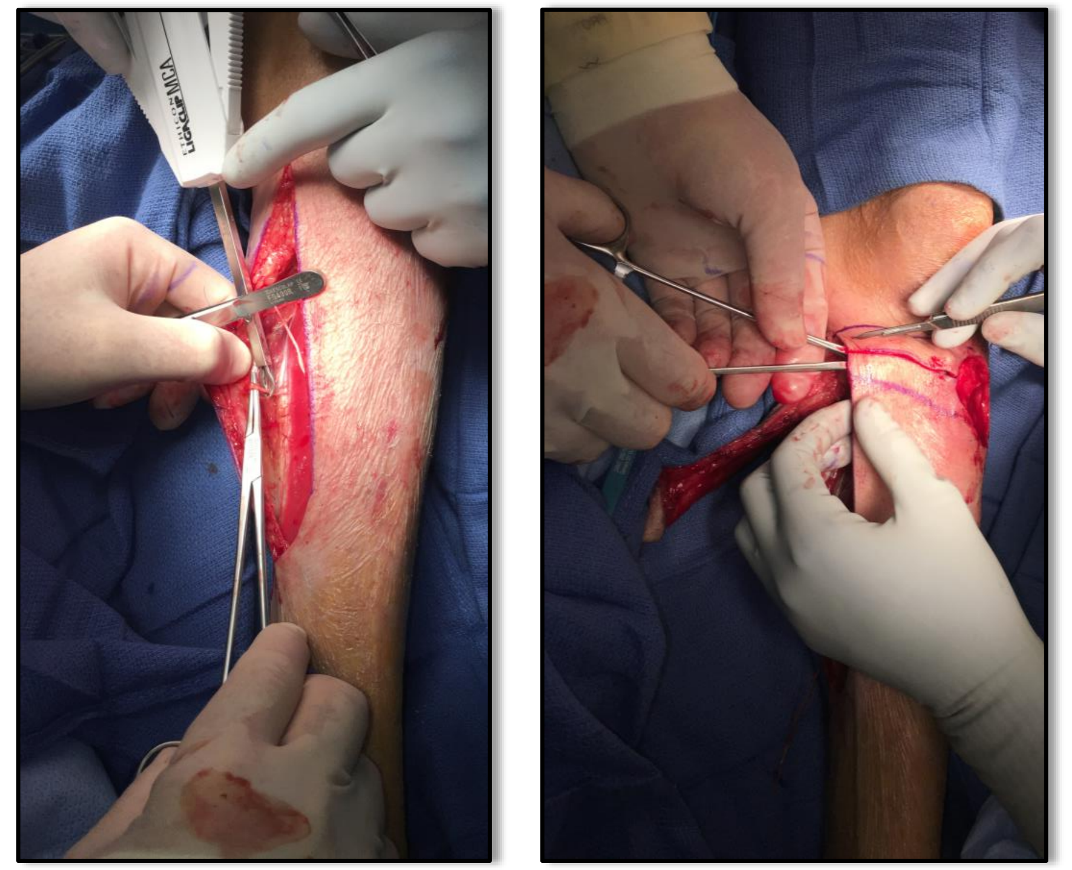

FIGURE 4: Cutaneous dissection was carried to the level of deep fascia with axis oriented proximally. Cutaneous tunnel was developed to connect the flap to the chronic wound.

FIGURE 5: Full thickness cutaneous flap was raised and cutaneous tunnel was developed in preparation for transposition.

FIGURE 6: The Saphenous Artery Perforator flap was transposed and secured in place under minimal tension via modified Allgower-Donati suture technique.

CONCLUSION

Many local flaps have been devised and used successfully for reconstruction of soft tissue defects over the knee and superior third of the tibia. Donor site morbidity can be minimized if the donor site is closed primarily with the partially or totally preserved skin. One flap which can be elevated from the medial lower leg is the saphenous artery perferator flap, which is supplied by the saphenous artery. The skin territory supplied by this artery is large and includes the anteromedial third of the leg. The many perforators of the saphenous artery make it a useful pedicle of a perforator flap. The saphenous artery perforator flap is thin, has a long vascular pedicle and a dependable nerve supply, and can be made quite large.

The saphenous artery perforator flap should be considered as a reconstructive option for defect closure about the proximal leg. Knowledge of anatomy and technique make the transposition of the saphenous artery perforator flap a practical method and its use makes it possible to obtain definitive and lasting coverage while reducing hospital length of stay.

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