

Saphenous Artery Flap for Exposed Patella

Author: Dr. K. V. N. Prasad, MS. MCh (Plastic Surgery),

Asst. Professor, Dept of Plastic Surgery, Kurnool Medical College, Kurnool, AP, India

Corresponding Author: Dr. Raja Ravi, MS. MCh.

Abstract: The saphenous artery flap of the lower leg based on the descending genicular branch of the superficial femoral artery. Saphenous artery is a reliable and best local flap for the cover of the defects around the knee joint exposing patella. It has been used successfully in 2 patients for reconstruction of soft tissue defects around the knee.

The size of these flaps ranged from 5 x 12 cm to 5 x 18 cm. Both flaps survived completely. These cases had minimal donor site morbidity because their donor sites were skin grafted with minimal post op morbidity.

Soft tissue defects over the knee and superior third of the tibia, complicated by exposure of bone, tendon, metal fixation devices or prostheses, require aggressive management. Many local flaps have been devised and used successfully for reconstruction of these soft tissue defects.

One flap which can be elevated from the medial lower leg is the saphenous artery 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 diameter of the

saphenous artery ranges from 1.5 to 2.0 mm. The saphenous artery flap was first used as a free flap. '

Date of Submission: 20-08-2019

Date of Acceptance: 03-09-2019

I. Anatomy And Operative Procedure

The saphenous artery is one of the two branches of the descending genicular artery originating from the superficial femoral artery. After leaving the adductor canal, the saphenous artery runs distally behind the sartorius muscle and enters the subcutaneous tissues below the medial condyle of the tibia. Beyond this point, this artery is referred to as the distal saphenous artery and continues on distally to reach the upper medial aspect of the lower leg.

Along its descending course, the saphenous artery supplies a large area of skin 10 cm above the knee on the medial thigh via its cutaneous branches and 20 cm below the knee on the anteromedial aspect of the leg via the distal saphenous artery. The skin of the medial aspect of the leg is also supplied by the septocutaneous vessels of the posterior tibial artery. The proximal group of perforators of this artery are located about 8 cm below the knee joint. There are good anastomoses between the saphenous artery and the proximal perforators of the posterior tibial artery in the proximal part of the medial aspect of the lower leg. These anastomoses provide an additional blood supply for large saphenous artery flaps.

The proposed flap is marked on the medial aspect of the proximal part of the lower leg; the anterior edge of the flap is along the medial border of the tibia. The pivot point is the insertion of the tendon of the sartorius muscle to the medial condyle of the head of the tibia where the distal saphenous artery runs from beneath the tendon. The proximal base, including the saphenous vessels in the middle of the flap, can be designed as wide as 5 cm.

Case 1





Case 2:



II. Discussion

A gastrocnemius muscle or musculocutaneous flap is a common local flap for cover of soft tissue defects around the knee and superior third of the tibia. These flaps have a reliable vascular pedicle and can offer a plentiful supply of tissue for reconstruction.

Although there is no significant functional loss postoperatively, part of one major muscle of the leg is sacrificed. Soft tissue defects of the lower leg can be associated with injury of the nearby muscles. Utilisation of these local muscles for reconstruction may further impair lower extremity function. The dissection of a muscle flap involves a deep surgical plane and there is a possible risk of injury of a major nerve. Another major drawback of myocutaneous flaps is the obvious deformity of the donor site. Fasciocutaneous flaps can also be used to cover soft tissue defects of the lower leg? In order to minimise the donor site morbidity, various modifications of the fasciocutaneous flap have been developed. Moscona et al.⁴ used an island fasciocutaneous flap to cover an injured knee. This flap was elevated from the posterior part of the lower leg.

The anteromedial aspect of the leg is another potential donor site, which is supplied mainly by the saphenous artery. The area of skin staining after selective injection of methylene blue of the saphenous artery extends to about 20 cm below the knee. This is a large artery which can supply a free flap as large as 29 x 8 cm.⁶ However, Acland et al. reported that this artery was absent in 4 out of 82 cases. In our patients, the saphenous artery was not isolated and the base of the flap was 4.5-5 cm wide. This wide pedicle was easy to

dissect and to transpose. It included the fascial vascular plexus of the medial genicular vessels in addition to the saphenous vessels. However, the vessels of the posterior calf flap were not incorporated in the pedicle; they are located midway between the posterior midline and the fibular head in 95% of clinical and cadaver dissections.

References

- [1]. Plast Reconstr Surg 1987; 80: 1-14. 1. Barfod B, Pers M. Gastrocnemius-plasty for primary closure of compound injuries of the knee. *J Bone Joint Surg* 1970; 52: 124-7.
- [2]. Lewis VL Jr, Mossie RD, Stulberg DS, Bailey MH, Griffith BH. The fasciocutaneous flap: a conservative approach to the exposed knee joint. *Plast Reconstr Surg* 1990; 85: 252-7.
- [3]. Hallock GG. Local knee random fasciocutaneous flaps. *Ann Plast Surg* 1989; 23: 289996.
- [4]. Moscona AR, Govrin-Yehudain J, Hirshowitz B. The island Adipofascial flap of the leg 395 fasciocutaneous flap: a new type of flap for defects of the knee. *Br J Plast Surg* 1985; 38: 512-14.
- [5]. Gumener R, Montandon D, Marty F, Zbrodowski A. Subcutaneous tissue flap in the limbs: an anatomical and clinical approach. *Ann Plast Surg* 1986; 16: 377785.
- [6]. Acland RD, Schusterman M, Godina M, Eder E, Taylor GI, Carlisle I. The saphenous neurovascular free flap. *Plast Reconstr Surg* 1981; 67: 763-74.
- [7]. Haertsch PA. The blood supply to the skin of the leg: a postmortem investigation. *Br J Plast Surg* 1981; 34: 470-7.
- [8]. Cormack GC, Lamberty BGH. *The arterial anatomy of skin flaps*. Edinburgh: Churchill Livingstone. 1986: 368870.
- [9]. Carrihuiry C, C&a MA, Vasconez-LO. An anatomic study of the septocutaneous vessels of the leg. *Plast Reconstr Surg* 1985; 16: 354463.
- [10]. Feldman JJ, Cohen BE, May JW Jr. The medial gastrocnemius myocutaneous flap. *Plast Reconstr Surg* 1978; 61: 531-9.
- [11]. Arnold PG, Mixer RC. Making the most of the gastrocnemius muscle. *Plast Reconstr Surg* 1983; 72: 38-48.
- [12]. Hallock GG. Relative donor site morbidity of muscle and fascial flaps. *Plast Reconstr Surg* 1993; 92: 70-6.
- [13]. Ponten B. The fasciocutaneous flap: its use in soft tissue defects of the lower leg. *Br J Plast Surg* 1981; 34: 215-20.
- [14]. Petry JJ, Walton RL. Follow-up on the posterior calf fasciocutaneous free flap. *Plast Reconstr Surg* 1985; 76: 149-51.
- [15]. Mathes SJ, Alpert BS, Chang N. Use of the muscle flap in chronic osteomyelitis: experimental and clinical correlation. *Plast Reconstr Surg* 1982; 69: 81529.
- [16]. Ruse11 RC, Graham DR, Feller AM, Zook EH, Mathur A. Experimental evaluation of the antibiotic carrying capacity of a muscle flap into a fibrotic cavity. *Plast Reconstr Surg* 1988; 81: 162270.
- [17]. Thatte RL, Laud N. The use of the fascia of the lower leg as a roll-over flap: its possible clinical applications in reconstructive surgery. *Br J Plast Surg* 1984; 37: 88894.
- [18]. Lin SD, Lai CS, Chou CK, Tsai CW, Tsai CC. Reconstruction of soft tissue defects of the lower leg with the distally based medial adipofascial flap. *Br J Plast Surg* 1994; 47: 13227.
- [19]. Lin SD, Lai CS, Tsai CC, Chou CK, Tsai CW. Clinical application of the distally based medial adipofascial flap for soft tissue defects on the lower half of the leg. *J Trauma* 1995; 38: 623-9.
- [20]. Yaremchuk MJ, Brumback RJ, Manson PN, Burgess AR, Paka A, Weland AJ. Acute and definite management of traumatic osteocutaneous effects of the lower extremity.

Dr.K.V.N. Prasad. "Saphenous Artery Flap for Exposed Patella." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 9, 2019, pp 26-28.