Lateral genicular artery flap for reconstruction of defects around the knee: a series of 5 cases


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ABSTRACT

The lateral genicular artery flap is a fasciocutaneous flap used for knee reconstruction with low donor site morbidity. It is raised from the lower lateral thigh and is based upon the cutaneous termination of superior lateral genicular artery. This flap showed constant anatomy and is reliable for coverage of defects at superior and lateral portions of the knee and the proximal part of the lower leg. The study period was from January 2016 to June 2017 where we operated on 5 patients, 3 for post-traumatic and 2 were post burn contracture excision. The flap was used as a pedicled fasciocutaneous and was based on the superior lateral genicular artery. Five cases underwent lateral genicular artery flap of which 4 were males and 1 was a female. Mean defect size was 12 cm×10 cm. All the donor sites were closed with a split skin graft. One patient had distal necrosis which was managed conservatively. The lateral genicular artery flap is a thin, versatile, reliable and easy to harvest flap for reconstructing defects around the knee, with good cosmetic and functional outcome.

Keywords: Fasciocutaneous, Knee defects, Reconstruction, Superior lateral genicular artery

INTRODUCTION

Reconstruction of defects around the knee has always been a challenge for the reconstructive surgeon. The aetiology of soft tissue defects around the knee can be post-burn contracture, post-traumatic or post-infective. Many local and free flaps have been described for such reconstruction but have disadvantages such as limited pedicle length and flap size and, in free flaps, difficult micro vascular anastomosis due to deep recipient vessels. However, a local flap is preferred as it simple and less morbid, but the use of a local cutaneous flap is limited because the pedicle length is short for reaching the upper third of the leg.1 Hayashi and Maruyama described the fasciocutaneous flap of the superior lateral genicular artery (SLGA) for reconstruction of defects around the knee, popliteal region, lower third of the thigh, and upper third of the leg.2 This flap is based upon the skin perforators of the SLGA from the right branch of the popliteal artery.3,4 Here, we present five cases of soft tissue defects around the knee which were covered using pedicled lateral genicular artery flaps with good functional and aesthetic outcome.

CASE SERIES

This is a prospective study of 5 cases who underwent lateral genicular artery flap between January 2016 and June 2017. Cases included 3 post traumatic and 2 were post-burn contracture excision. The skin island was designed to fit the resultant defect and was based on the superior lateral genicular artery vascular pedicle in all cases and all the donor sites were closed with split skin graft. All cases were followed up post-operatively from a minimum of 8 months to a maximum of 14 months. The
skin island was designed on the lateral aspect of the lower thigh when the patient standing (Figure 1). The distal end of the flap must cover the skin over the lateral condyle of the femur, to include the emergence of the cutaneous perforator of the SLGA. The proximal end of the flap can be safely extended to the midpoint between the greater trochanter and the lateral condyle of the femur. The patient was placed in a lateral decubitus position and the incision is started from the proximal end of the flap with the plane of dissection on the loose areolar layer over the deep fascia. Distal to the point 10 cm above the knee joint, the dissection should be carried down to the iliotibial tract for the safe dissection of the intermuscular septum between the vastus lateralis and short head of the biceps femoris. After division, the vascular pedicle can be identified just above the lateral condyle of the femur (Figure 2). This island lateral genicular artery flap is then elevated and transferred to the defect (Figure 3). The flap arc of rotation reaches the distal third of the thigh, knee, and popliteal fossa, and the proximal third of the lower leg.

Five cases underwent lateral genicular artery flap between January 2016 and June 2017 of which 4 were males and 1 was a female. The age group varied from 30 to 59 years with a mean age of 42 years. The flap dimensions varied from 9×9 cm to 17×11 cm with a mean of 12×10 cm. The mean harvesting time was 80 minutes (range 55-95 minutes). There was complete flap survival in all patients with 1 patient having marginal necrosis which settled conservatively. There was flap edema for the initial 2 to 3 days which later resolved with no flap congestion. The donor areas of all the patients healed well with no restriction in knee joint mobility. The average hospital stay ranged from 5 to 9 days. The photographs of the cases done are described below (Figure 4-7).

Figure 1: Flap marking.

![Figure 1: Flap marking.](image)

Figure 2: Vascular pedicle (black arrow).

![Figure 2: Vascular pedicle (black arrow).](image)

Figure 3: Flap over the defect.

![Figure 3: Flap over the defect.](image)

Figure 4: Patient 1 (a) Pre-operative and (b) post-operative photographs of patient with post burn contracture.

![Figure 4: Patient 1](image)

Figure 5: Patient 2 (a) Pre-operative (b) post-operative photographs of patient with post burn contracture.

![Figure 5: Patient 2](image)

Figure 6: Patient 3 (a) Pre-operative and (b) post-operative photographs of patient with post traumatic wound and knee in full flexion.

![Figure 6: Patient 3](image)
microvascular surgery of this flap.\textsuperscript{2} In the study by Zumiioti et al they used the histomorphometric evaluation of arteries for increasing the precision of diameter measurements and their findings (diameter of 1.161±0.012 mm) allowed the use the flap by means of microsurgery transfer.\textsuperscript{10} The flap colour and texture are similar to those of the knee area and account for a better quality aesthetic appearance, as compared to muscular or musculocutaneous flaps and caused no issues in knee joint mobility.

CONCLUSION

The lateral genicular artery flap is a single stage axial pattern flap which provides a durable and a thin pliable skin cover for defects around the knee with good cosmesis and no functional or sensory deficit.

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REFERENCES
