



The 'propeller' distal anteromedial thigh perforator flap. Anatomic study and clinical applications

Fabrizio Moscatiello ^{a,*}, Jaume Masià ^a, Ana Carrera ^b,
José Antonio Clavero ^c, José Ramòn Larrañaga ^a, Gemma Pons ^a

^a Plastic Surgery Department, Hospital de la Santa Creu i Sant Pau, Universitat Autònoma de Barcelona, Sant Antoni M. Claret 167, 08025 Barcelona, Spain

^b Human Anatomy and Embryology Department, Universitat de Barcelona, Barcelona, Spain

^c Radiology Department, Clínica Creu Blanca, Reina Elisenda Moncada 17, 08034 Barcelona, Spain

Received 3 August 2006; accepted 26 February 2007

KEYWORDS

Perforator;
Thigh;
Propeller;
Lower limb

Summary *Background:* The leg and peripatellar region have always been known as a poor source of available flaps. One flap donor site that has proven to be adequate is the distal anteromedial half of the thigh. Due to the potential and plentiful vascular sources of this anatomic region we decided to study the distal anteromedial thigh and its clinical applications.

Anatomic study: Sixteen cryopreserved inferior limbs were latex-injected in the femoral artery and the skin perforators of the distal anteromedial thigh and their source vessels were studied.

Clinical study: In a period between December 2000 and June 2005, skin islands from the distal anteromedial aspect of the thigh of six patients were transferred, as local perforator flaps, to reconstruct the peripatellar region and upper leg soft tissue defects. Every flap was based on a single adequate perforator vessel. The tissue was rotated, as a 'propeller', through 180° and the flap was named 'the propeller distal anteromedial thigh perforator flap'.

Results: In the distal anteromedial thigh the anatomic variability includes not only perforator vessels but also their source vessels. Skin perforators can come from each of the deep vessels.

Our clinical results, with a follow up of 1–4 years, show no total flap losses. Partial necrosis > 20% happened in one diabetic patient.

Conclusion: The propeller distal anteromedial thigh perforator flap can be reliably transferred based on only one adequate perforator vessel. It reduces the morbidity and improves the availability of the distal anteromedial thigh as a flap donor site and represents an additional reconstructive option for knee and upper leg defects.

© 2007 British Association of Plastic, Reconstructive and Aesthetic Surgeons. Published by Elsevier Ltd. All rights reserved.

* Corresponding author. Address: Via Tasso 181, 80127 Napoli, Italy. Mobile: 00393395077074.
E-mail address: fabriziomoscatiello@tiscali.it (F. Moscatiello).

Knee and leg soft tissue defects have always been challenging, due to the poor availability of local flaps. Before the introduction of microsurgery, surgeons had few reconstructive options as random skin flaps, muscular^{1–5} or musculocutaneous flaps^{6,7} and when a large amount of skin was needed a cross-leg was carried out,⁸ immobilising the limbs for weeks.

With the development of knowledge in vascular anatomy, in the last 5 years, perforator flaps have become routine surgical options in the head and neck,^{9,10} breast^{11,12} and lower limb^{13,14} reconstruction. Newer and more reliable local or free flaps are now available.

One of the flap donor sites that proves to be very adequate for knee and upper leg soft tissue reconstruction is the distal anteromedial half of the thigh.^{15–17} Skin islands from this region can be transferred as local or free flap based on different pedicles.^{15–22}

As shown in several papers on flaps raised from this region, perforator branches that nourish this area can come from the saphenous artery,^{15,17–21} the musculoarticular or osteoarticular branch of the descending genicular artery,^{15,19} the superior medial genicular artery,¹⁶ the femoral artery²² or the popliteal artery.^{15,16}

Some authors^{18–21} have described reversed island flaps, from this region, nourished by the peripatellar vascular plexus, formed by vascular connections between the saphenous artery, the osteoarticular branch from the descending genicular artery, the inferior medial genicular artery and perforator branches from the posterior tibial artery. When harvesting these flaps, most of the main vessels have to be ligated in their proximal course, often also interrupting the sartorius muscle, and a suitable reversed flow has to supply the flap vascularisation. Furthermore, sometimes, in posttraumatic or oncological defects, these flaps could be all unavailable due to the uncertain or interrupted vascular connections.

In order to reduce the morbidity, avoiding the sacrifice of a vessel or damage to a muscle, and to improve the availability of this flap donor site in situations where the peripatellar vascular connections are not guaranteed, a regional anatomic review of the vascular structures was made and the possibility of planning distal anteromedial thigh perforator flaps, based on a single suitable perforator, was verified. The tissue transfer was carried out through a rotation of 180° according to the technique first described by Hyakusoku et al. in 1991 and called 'the propeller method'.²³

Due to the potential and plentiful vascular sources of this anatomic region we decided to study the vascular anatomy of the distal anteromedial thigh and its clinical applications.

Materials and methods

Anatomic study

The cutaneous perforators of the distal anteromedial aspect of the thigh, both with their source vessels, were studied in 16 preserved and latex-injected inferior limbs.

A spinorotulean (from the superior anterior iliac spine to the middle of patella) and extended medial incision at inguinal and infracondylear levels was performed in all

limbs. Through the skin incisions, a subfascial medial dissection, starting on the rectus femoris muscle and reaching the posterior border of the sartorius muscle, was performed. The purpose of our dissections was to evaluate the location of all the skin perforators and, through a retrograde dissection, obtain an arterial anatomic specimen of the vessels from their entry in the fascia to their origin from the femoral and popliteal arteries.

Parameters evaluated and recorded were as follows:

1. distance between the medial knee joint line and the origins of the descending genicular artery, saphenous artery, osteoarticular branch, muscular branches of vastus medialis and other perforator branches from the femoral artery;
2. length of the descending genicular artery;
3. diameter at their origin of the descending genicular artery, saphenous artery, osteoarticular branch, muscular branches and other perforator branches encountered;
4. number and diameter of skin perforators at their entry in the fascia (with a subfascial approach);
5. length of skin perforators from the entry in the fascia to the source vessel;
6. distance of the skin perforators, at the entry in the fascia, from the medial knee joint line and the spinorotulean line.

A descending genicular artery (DGA) was recognised as the common trunk where the saphenous artery (SA) arose with the osteoarticular branch (OAB), articular branch (AB) or osteal branch (OB).

The OAB was identified as the common trunk that, after the origin of the SA from DGA, divided into the AB and the OB.

The AB was pinpointed as the vessel that runs downward on the medial aspect of the knee joint and that, usually, anastomoses with the inferior medial genicular artery.

The OB was identified as the vessel that nourished the femur periosteum just proximal to the medial condyle.

Clinical study

In a period between December 2000 and June 2005 we performed six propeller distal anteromedial thigh perforator flaps for reconstruction of the knee and upper third of the leg soft tissue defects. There were five male and one female patients. The mean age was 55.5 years. Three patients were smokers and did not stop smoking prior to the operation. One patient had type II diabetes mellitus. Three patients had a sarcoma of the anteromedial upper third of the leg (50%), two patients had an unstable scar of the anterior surface of the knee (34%), one patient had an open fracture of the medial tibial plate (17%).

In the operating room, the patient was placed in supine position, with the knee and hip slightly flexed and externally rotated.

A preoperative map was defined by the use of Doppler ultrasounds but the information obtained with the aid of this technology is only orientative because false positives are frequent.²⁴ In the last patient a new technology of perforators mapping was used by the aid of multidetector CT

Download English Version:

<https://daneshyari.com/en/article/4121592>

Download Persian Version:

<https://daneshyari.com/article/4121592>

[Daneshyari.com](https://daneshyari.com)