

# Detailed Anatomy of the Superior Lateral Genicular Artery for Design of a Vascularized Bone Flap from the Lateral Femoral Condyle

Mohamed Morsy, MBBCh; Yoo Joon Sur, MD, PhD; Michel Saint-Cyr, MD, Steven Moran, MD

**Financial Support/Disclosure:** This work was fully supported through Mayo Clinic intramural funds. None of the authors has any financial disclosures related to the subject of the article.

**Hypothesis:** The superior lateral genicular artery (SLGA) is the main blood supply to the lateral femoral condyle.<sup>1-3</sup> This study addresses the detailed anatomy of this artery from the reconstructive surgeon's point of view, for the harvest of a vascularized bone flap from the lateral femoral condyle.

**Methods:** 12 fresh frozen lower extremities were used. These were injected with ward's red latex (Ward's, Rochester, NY), then left to cool for 24-48 hours. Through a posterior incision at the popliteal fossa, blunt dissection was performed to the popliteal vessels. The SLGA was identified at its origin from the popliteal artery, and meticulously dissected distally along its course. The course, diameter, anatomical relations, length and branches were documented. Dissection was carried out under 3.5x loupe magnification and all measurements were done using an electronic digital caliper.

**Results:** The SLGA was consistent in all specimens. It originated from the popliteal artery at a mean distance of 40.07 mm proximal to the knee joint line. The mean diameter at origin was 1.73 mm. It ran laterally posterior to the femur, until the lateral intermuscular septum. Posterior to the septum, it divided into superficial and deep branches. At this point, a sizable skin perforator emerged and ran laterally posterior to the intermuscular septum to supply the lateral skin (Figure 1). The superficial branch travelled anteriorly giving off skin perforators and ended at the superolateral patella. The deep branch pierced the intermuscular septum to travel anteriorly on the lateral surface of the femur, giving branches to the vastus lateralis, periosteum of the femur and ending by terminal branches to the lateral femoral condyle (Figure 2). Mean length from origin of the SLGA to the termination point of the deep branch was 63.29 mm.

**Conclusion:** The SLGA has very consistent anatomy, formidable length and suitable diameter at origin for microvascular anastomosis, which makes it a good pedicle for a vascularized bone flap from the lateral femoral condyle.

## References:

1. Higgins JP, Burger HK. Osteochondral flaps from the distal femur: expanding applications, harvest sites, and indications. J Reconstr Microsurg. 2014 Sep;30(7):483-90.
2. Kirschner MH, Menck J, Hofmann GO. Anatomic bases of a vascularized allogenic knee joint transplantation: arterial blood supply of the human knee joint. Surg Radiol Anat. 1996;18(4):263-9.
3. Shim SS, Leung G. Blood supply of the knee joint. A microangiographic study in children and adults. Clin Orthop Relat Res. 1986 Jul(208):119-25.

## Figure Legends:

Figure 1: Posterolateral view of the supracondylar femoral area with the biceps removed showing the SLGA. (A) Popliteal artery, (B) SLGA, (C) Superficial Branch, (D) Deep Branch, (E) Skin perforator, (F) Lateral condyle, (G) Vastus lateralis, (H) Iliotibial tract.

Figure 2: Terminal branches of the SLGA on the lateral condyle

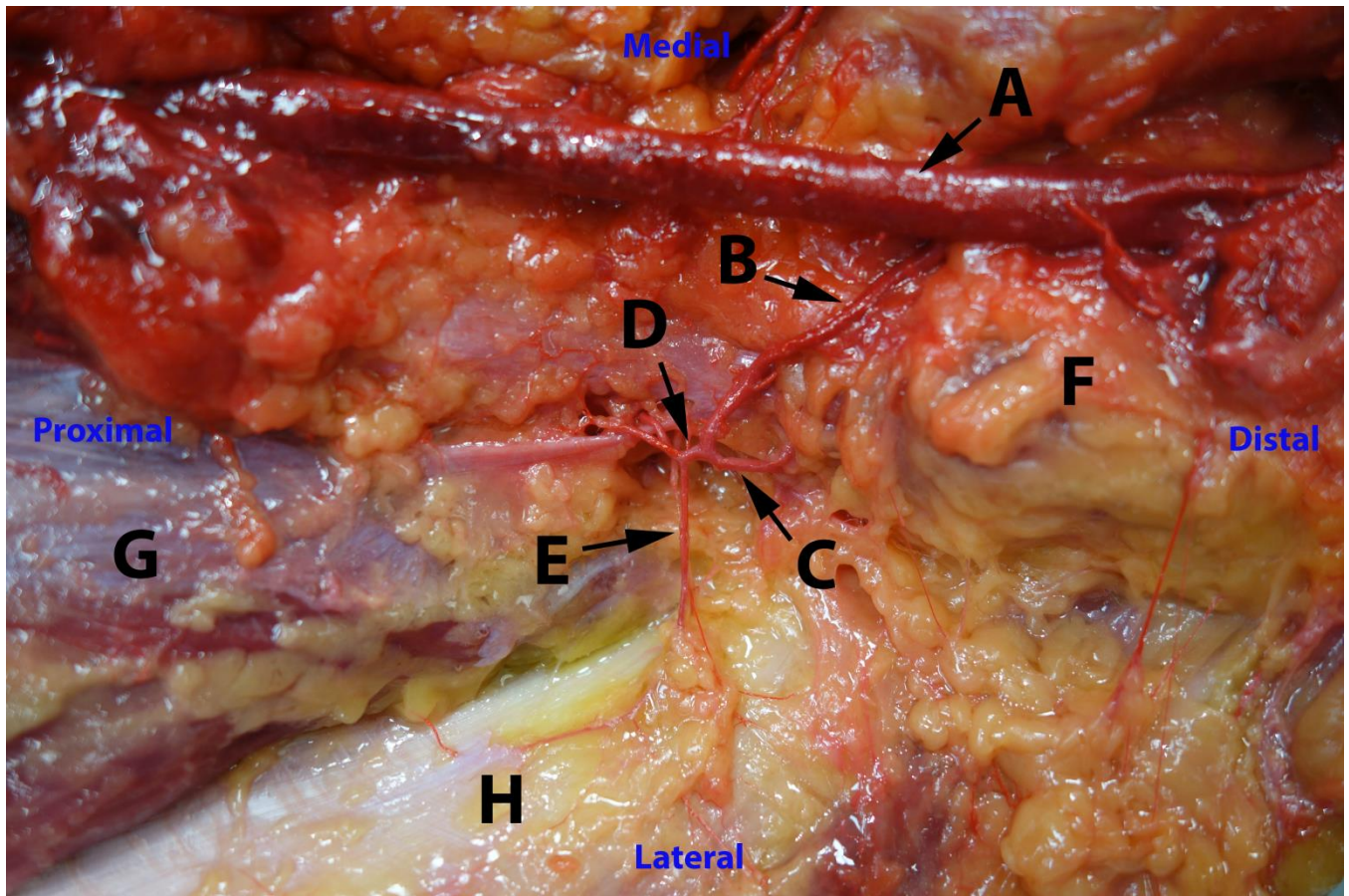


Figure 1

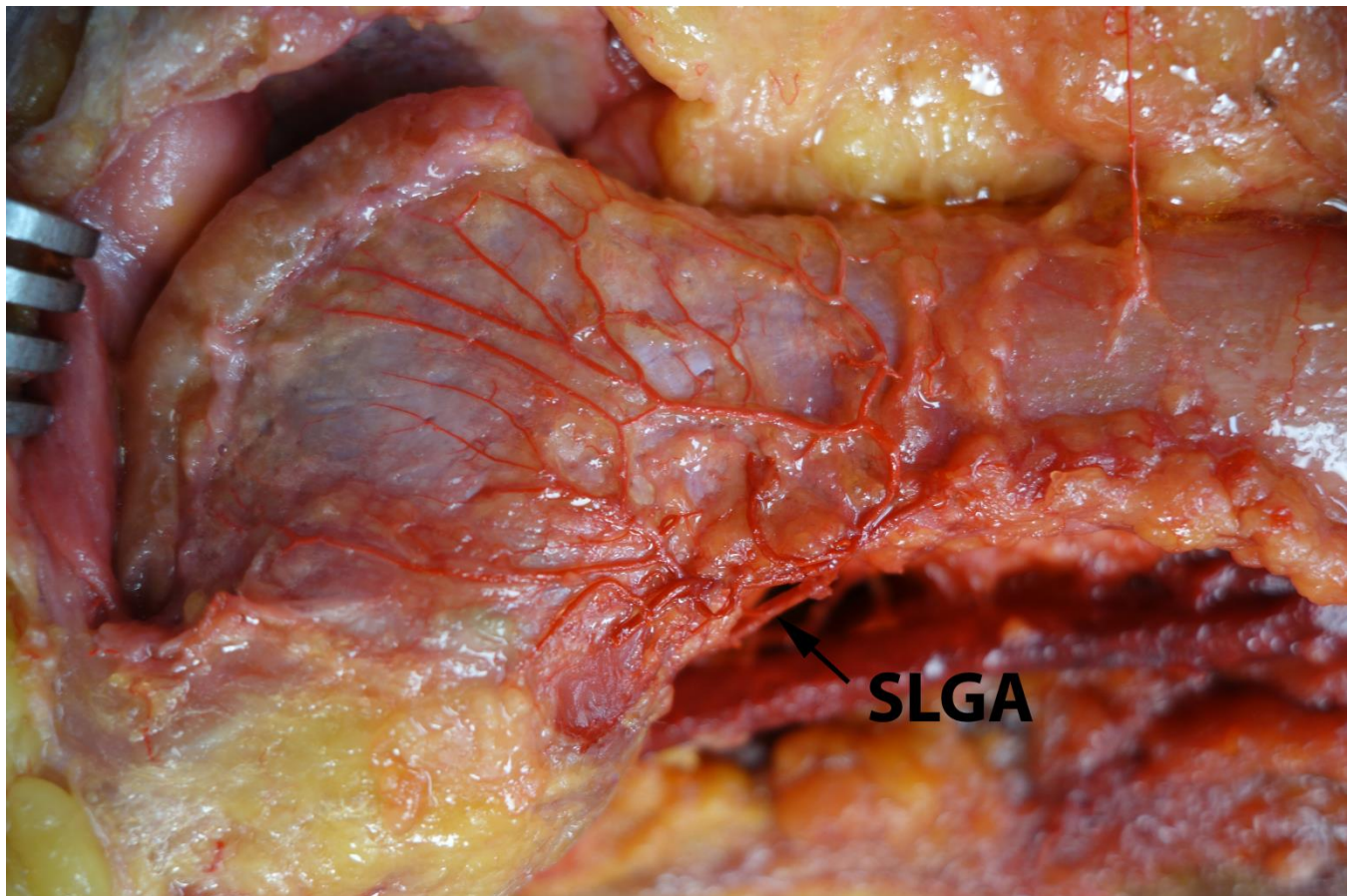


Figure 2