

CASE REPORT

Sural artery injury with arteriovenous fistula: case report about a rare complication following arthroscopic medial meniscectomy

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Abstract

This case report presents a patient with hematoma and pain after a knee arthroscopy with partial medial meniscectomy. A lesion of the sural artery was treated by endovascular coiling. The level of evidence is IV.

INTRODUCTION

Knee pain as a result of a meniscus tear is one of the most common complaints at the orthopedic outpatient clinic [1]. When conservative treatment fails or mechanical problems are prominent, arthroscopy is the operative treatment of choice. The low rate of complications, 0.56–8.2% [2], has contributed to the acceptance of arthroscopy in orthopedic surgery. Vascular complications are scarcely reported. The anatomic location of the popliteal artery with the posterior capsule of the knee joint makes it vulnerable to injury [2, 3]. In this case report, we present a patient with a partial medial meniscectomy complicated with a laceration of one of the collaterals of the popliteal artery and the sural artery.

CASE REPORT

A 35-year-old male patient with posttraumatic right knee pain was referred to our outpatient clinic. He reported medial knee pain following a hyperflexion/rotational trauma 3 months earlier. A knee arthroscopy with retropatellar nettoyage (trimming of damaged patellar cartilage) and removal of a loose cartilage body was performed in the ipsilateral knee 2 years before.

On physical examination, the McMurray test was positive and there were no indications of ligament injury. Standard radiographs showed no abnormalities. An additional magnetic resonance imaging was performed, which showed a small tear in the posteromedial meniscus. During a standard knee arthroscopy under spinal anesthesia, a bucket-handle tear of the medial meniscus was visible and partial medial meniscectomy was performed by an orthopedic surgeon who already performed hundreds of knee arthroscopy procedures. The duration of surgery was 29 min and the tourniquet time was 40 min. Standard, dynamic rehabilitation was implemented with a compression bandage for 24 h.

Immediately postoperatively the patient reported progressive pain in the popliteal fossa. The patient was discharged the same day with adequate pain medicine (paracetamol, celecoxib and tramadol). Eight days postoperative, the patient was sent in by his GP with the same complaints and a substantial hematoma in his popliteal space. Sensibility and pulsations were intact. A lower extremity ultrasound showed an active bleeding (28 × 19 mm) of the sural artery with a thrombosed hematoma of 71 × 41 mm. Within 2 h, a digital subtraction angiography via the ipsilateral common femoral artery (CFA) was performed and showed an active blush and an arteriovenous (AV) fistula with proximal

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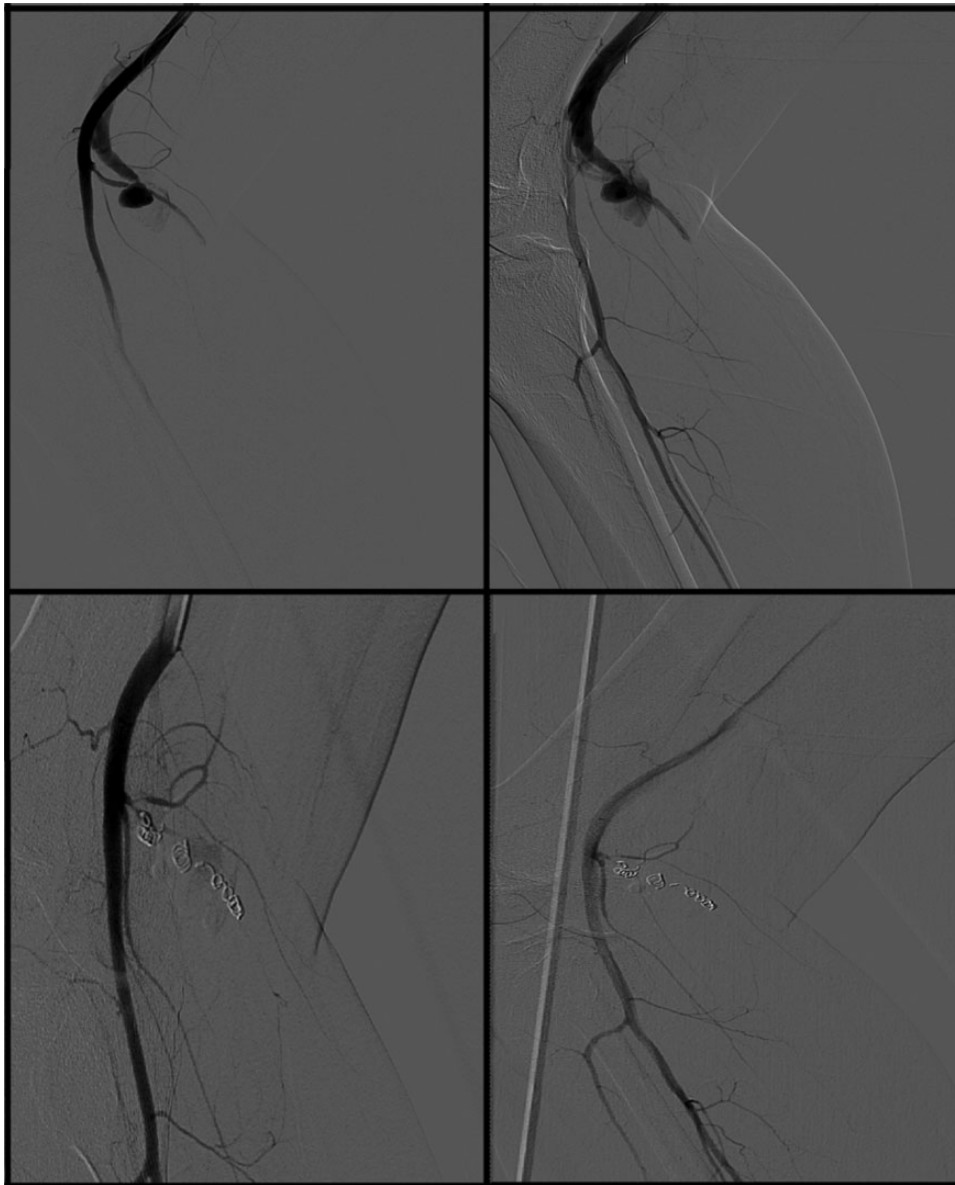


Figure 1: Digital subtraction angiography showed active blush of the sural artery and AV fistula with proximal filling (upper two images). After coiling procedure, hemostasis was accomplished (lower two images).

filling out of two branches (Fig. 1). The lesion was coiled (Tornado® Embolization Coil, Cook Medical, Bloomington, USA) both proximal and distal. The puncture in the CFA was closed with an angio-seal (St Jude Medical, Inc., St Paul, USA). After this intervention, the pain reduced and discharge followed after 2 days.

Unfortunately, the patient experienced persistent medial knee pain as a result of a small tear in the posteromedial residual meniscus. A new partial arthroscopic meniscectomy, without tourniquet use, of the knee was performed. No complications were reported during and after this procedure.

DISCUSSION

The mechanism of arterial injury in knee arthroscopy is not always known. Direct injury by instruments or indirect injury due to rough flexion and extension is described [4]. The popliteal

neurovascular bundle is vulnerable due its proximity to the posterior capsule and is only separated by a small amount of fat [1, 5, 6]. During posteromedial meniscectomy, forced external rotation should be avoided. This results in projecting the popliteal artery and medial inferior genicular artery close to the resection area [2]. It is important during arthroscopy, especially in the back of the knee, to see the tip of any instrument and create a clear field of vision [5]. The superior lateral geniculate artery (during lateral release) and the saphenous vein (during placement of posteromedial portal or during medial meniscectomy) are also vulnerable, and the same precautions need to be taken [5]. The arteries above-mentioned and their relation to the sural artery are shown in Fig. 2.

Other reported vascular complications in relation to knee arthroscopy are pseudoaneurysm and AV fistula [8]. AV fistulas are rare and often results in a delay of diagnosis due to their aspecific presentation [9]. Described causes could probably be

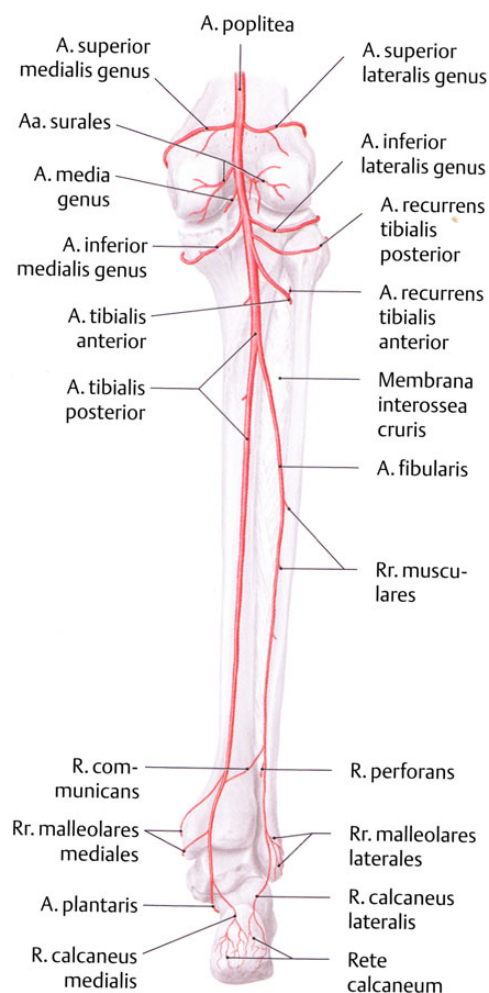


Figure 2: Anatomy of the popliteal artery [7]. Obtained copyright permission by Frankfurter Buchmesse RightsLink.

thermic damage or instrumental injury of the artery and vein. Also, patients with an asymptomatic AV fistula preoperative could become symptomatic due to changes in relative pressure in the vessels [9]. Aneurysm of the popliteal artery caused by lesion of the wall is probably a result of manipulation at the dorsal capsule of the knee [3].

In the literature, no clear association between tourniquet use and vascular injury following knee arthroscopy is reported. Vascular injury during operation could probably be masked as a result of tourniquet use [6].

Our case could be a result of a pre-existent asymptomatic AV fistula. Which is vulnerable during knee arthroscopy in

combination with posterior capsule manipulation. Another possibility is an AV fistula as a result of injury during arthroscopy, or a direct lesion of the sural artery as a result of manipulation of the posterior capsule. During operation, no complications were encountered and a standard procedure was performed. This makes the first scenario perhaps the most likely.

The occurrence of vascular complications is considered as extremely rare, and this makes these potentially devastating complications less suspected by surgeons or related healthcare professionals.

It is important to realize that even weeks after arthroscopic meniscectomy serious vascular complications could develop. Increasing pain, swelling, signs of acute ischemia and mass effects or ecchymosis of the calf or popliteal fossa are symptoms which should be linked to these vascular complications [6].

CONFLICT OF INTEREST STATEMENT

None declared.

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