

Anterior tibial artery occlusion post total knee arthroplasty

A case report

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Abstract

Rationale: Total knee arthroplasty (TKA) is a globally well-accepted surgery because of its good outcome and safety. Although TKA-associated arterial injuries occur, postoperative anterior tibial artery (ATA) occlusion has not been reported yet. Herein, we present a case of ATA occlusion after TKA.

Patient concerns: A 42-year-old man with a 6-year history of right knee pain after right patella fracture treated with open reduction was referred to our clinic. Valgus and contracture deformities were detected in the right knee. Severe osteoarthritis (OA) in the right knee and multiple osteochondromas were observed on radiography.

Diagnosis: On the basis of clinical and imaging findings, the patient was diagnosed with OA and multiple osteochondromas.

Interventions: TKA was performed in the right knee and the osteochondromas were resected. ATA occlusion was found postoperatively and was treated conservatively.

Outcomes: Although the right ATA occlusion did not resolve, the patient recovered well postoperatively, with pain relief and recovery of right knee range of motion.

Lessons: The clinical outcome in a case of ATA occlusion after TKA demonstrates that conservative treatment could be appropriate in this context.

Abbreviations: ATA = anterior tibial artery, DSA = digital subtraction angiography, OA = osteoarthritis, PTA = posterior tibial artery, TKA = total knee arthroplasty.

Keywords: anterior tibial artery, occlusion, total knee arthroplast

1. Introduction

Although total knee arthroplasty (TKA) is considered a safe elective surgery; serious and sometimes fatal complications can occur.^[1] Arterial injury associated with TKA is a relatively rare but potentially devastating complication. The reported incidence of vascular complications after TKA is between 0.03% and 0.19%.^[2–8] Severe popliteal artery injury could lead to lower limb amputation.^[4] However, there is no report regarding

anterior tibial artery (ATA) occlusion associated with TKA. Herein, we report a case of ATA occlusion after TKA, treated nonoperatively.

2. Case report

A 42-year-old man (height, 158 cm; weight, 62 kg) with multiple osteochondromas was referred by the rehabilitation department because of a 6-year history of right knee pain after right patella fracture treated with open reduction. On physical examination, valgus and contracture deformity was noted in the right knee. The range of motion in the right knee was 20 to 30 degree. End-stage osteoarthritis in the right knee and multiple osteochondromas were seen on radiographs (Fig. 1). Preoperative examination results, including vascular ultrasound of the right lower limb, were normal. No surgical contraindication was found preoperatively. Therefore, right TKA was performed. During the operation, tensor fasciae latae was found to be tented by the distal femoral osteochondroma; thus, it was resected with a chisel (Fig. 2). The pulse of the dorsalis pedis artery was not sensed postoperatively. The posterior tibial artery pulse was sensed normally, and the foot showed normal sensation and temperature. Vascular ultrasound of the lower limb was then performed to check the artery. Results showed right ATA occlusion at the initial segment.

The patient subsequently underwent anticoagulant (6000AXAIU, IH, twice a day) and vasodilator (alprostadil, 10 µg, IV, 4 times a day) therapy. The patient recovered well

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Consent for publication: Informed written consent was obtained from the patient for publication of this case report and accompanying images.

The authors report no conflicts of interest.

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Figure 1. Preoperation anterior-posterior x-ray.

postoperatively, with resolution of pain and recovery of 0 to 90 degree right knee range of motion at discharge. At his 1-month outpatient review, the right ATA occlusion had not yet resolved, as confirmed by vascular ultrasound.

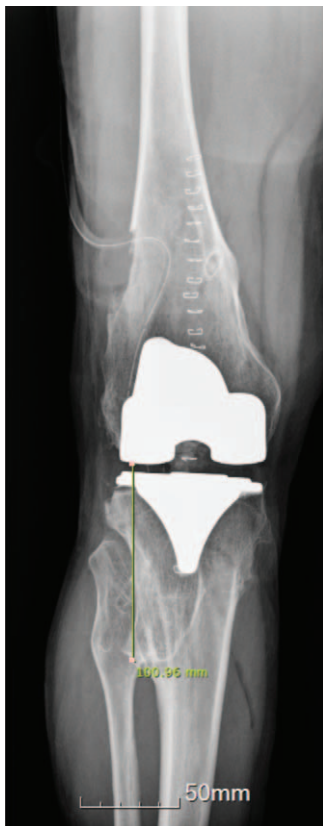


Figure 2. The post operation anterior-posterior x-ray. Perpendicular measurements from lateral joint line to inferior border of the fibular head.

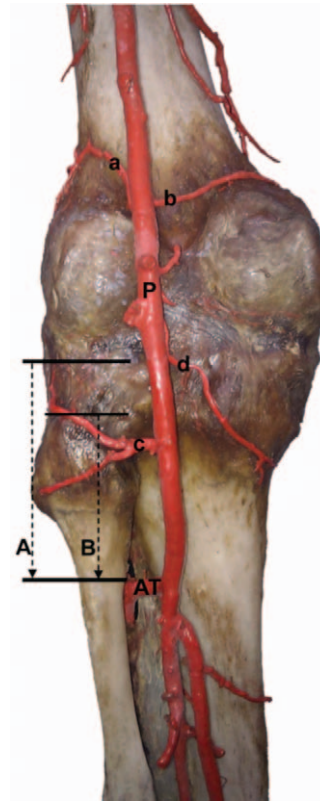


Figure 3. Vascular anatomy of the posterior left knee. Popliteal artery (P), lateral superior genicular artery (A), medial superior genicular artery (B), lateral inferior genicular artery (C), medial inferior genicular artery (D), anterior tibial (AT) artery. Perpendicular measurements from lateral joint line (A) and fibula head (B) to anterior tibial artery. (With permission of [9].)

3. Discussion

We present the case of a 42-year-old man with ATA occlusion after TKA, with a good postoperative outcome, although the occlusion had not resolved.

The ATA arises from the popliteal artery, a weaker anterior branch of the posterior tibial artery (PTA). The ATA arises at the lower border of the popliteus muscle, enters the anterior compartment of the leg via an aperture at the interosseous membrane, and courses anteriorly on the interosseous membrane medial to the neck of the fibula. As it approaches the ankle joint, it lies more superficially and becomes the dorsalis pedis artery. Of note, the larger PTA communicates with the ATA via branches, thus enabling retrograde flow from the PTA to the ATA. Heidari et al performed a cadaveric study and reported that the ATA coursed through the interosseous membrane at 46.3 ± 9.0 mm (range 27–62 mm) distal to the lateral tibial plateau and 35.7 ± 9.0 mm (range 17–50 mm) distal to the fibula head (Fig. 3).^[9] In this patient, there was osteochondroma at the proximal fibula, and the distance between the lateral joint line to the inferior border of the fibular head was about 100 mm (Fig. 2). It was quite likely that there was ATA malformation, which contributed to ATA occlusion postoperatively. As ATA is not the major artery responsible for blood supply to the shin, it is even hypoplastic or completely absent (1.7%), the limb functions well.^[10] In this patient, the ATA occlusion had not resolved even after anticoagulant and vasodilator treatment for 1 month, but the lower limb was not in vasoocclusive crisis.

The limitation of this case is that digital subtraction angiography was not performed because of medical insurance issues.

Currently, this is the only case report that describes ATA occlusion complicating TKA. Given our understanding of the anatomy of ATA, ATA is not the major artery responsible for circulation in the lower limb and therefore the occlusion can be managed conservatively without aggressive treatment.

Author contributions

Conceptualization: Xin Li.

Data curation: Yang Song, Jincheng Wang.

Formal analysis: Jincheng Wang.

Supervision: Xin Li.

Writing – original draft: Xin Li.

Writing – review & editing: Xin Li.

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