

CASE REPORT

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Femoral exostosis a cause of Popliteal Artery Pseudo aneurysm: Case report and review of the literature

Lamiaie Bouimetarhan, Othman Ayouche, Ittimade Nassar

ABSTRACT

Introduction: Osteochondromas are benign bone tumors. They can be asymptomatic or damage adjacent structures and can cause various types of complications among them pseudo aneurysms, which are uncommon consequences of this pathologic osseous growth. The advent of new radiologic modalities has allowed for early diagnostics and treatment of these entities. **Case Report:** We report the case of a 29-year-old female, with no history of chronic disease, who consulted for a throbbing sensation behind the knee and a lump mass in the popliteal fossa. We conducted a doppler ultrasound and a CT-angiography, which demonstrated a popliteal artery aneurysm complicating an osteochondroma. A surgery, was done with no complication in the 24 months follow-up. **Conclusion:** Early diagnosis followed by surgical resection is the mainstay of management popliteal artery aneurysm complicating osteochondromas. CT angiography is the modality of choice for the detection and evaluation of osteochondromas vascular complications.

Keywords: Bone exostosis, Computed tomography, Popliteal artery, Pseudo aneurysm, Ultrasound

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INTRODUCTION

Osteochondromas are the most common benign tumors of the bones developing during the adolescence and occurring most commonly in the lower limb and more specifically at the distal femoral metaphysis [1]. It occurs in (1 to 2%) of the population [2]. Vascular complications would result from “trapping” vascular structures by the adjacent exostosis. The involvement of the popliteal artery is the most common vascular complications [3]. Arterial pseudo aneurysms are encapsulated hematomas communicating with the lumen of a ruptured artery.

Its formation mechanism, associated with bone exostoses, has been well described in the literature. We report a case of a 29-year-old female, with a solitary exostosis of the left femur who presented a pseudo aneurysm of the popliteal artery, who then underwent a duplex scan and a CT-angiography for diagnosis after which she was treated surgically.

CASE REPORT

A 29-year-old female, with no history of chronic disease, consulted for a throbbing sensation behind the knee. Physical examination demonstrated the presence of a lump mass in the popliteal fossa, which measured 1 cm. The examination found a painless pulsatile mass of the

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popliteal fossa, with no associated neurological deficit. Dorsalis pedis (DP) and posterior tibial (PT) pulses were conserved.

Doppler ultrasound showed a pseudo aneurysm of the left popliteal artery associated with peripheral thrombosis (Figure 1). CT angiography revealed the presence of a Left popliteal artery saccular aneurysm partially thrombosed measuring 32x30 mm with a neck measuring 03 mm and a solitary femoral exostosis on the distal end (Figures 2 and 3). There was no signs of popliteal vein compression. The patient then underwent a same time surgery for the aneurysm and a resection of the osteochondroma. The steps of surgical techniques were: A posterior double skin incision supra and infra articular was performed which allowed for the clamping of the artery. The patient underwent a flattening of the aneurysm and restoration of vascular continuity with an end-to-end anastomosis. After the control of the aneurysm, a resection of the osteochondroma was performed. Follow up sonography evaluated for post-operative ischemia or thrombosis, which demonstrated the permeability of the popliteal pedicle. The patient returned home two weeks after his surgery. Histological examination of the exostotic tissues had shown normal bone tissue with no sign of malignant degeneration. After surgery the patient's vascular status was regular, with no signs of deficit. No vascular complications were noted during our 24 months follow-up, which consisted of a physical exam, and a duplex scan.

DISCUSSION

Osteochondromas are frequent benign bone tumors. It develops during adolescence. Its most common site is the distal femoral metaphysis [1, 2]. It is among the "let alone bone lesions". But in some cases surgical treatment might be prompted. Vascular complications, observed in (11%) of cases, would result from «trapping» vascular structures by adjacent exostosis [3]. In fact, osteochondromas have a protective cartilaginous cap, which ossifies at the end of the growth period with the epiphyseal fusion. The resorption of this cartilaginous cap might happen in young adults, leaving sharp bone, which can be a source of repetitive micro traumatism to the arteries wall resulting in complications such as pseudoaneurysms or thrombosis [2].

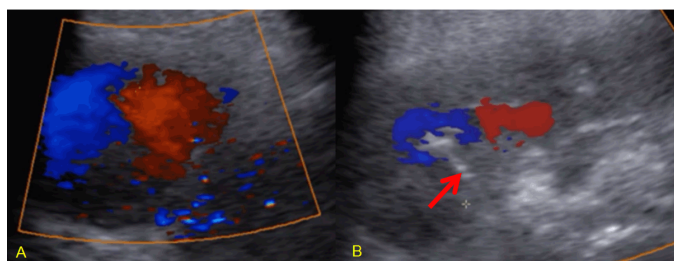


Figure 1: Doppler ultra-sonography of the popliteal fossa (A) cystic structure with the "yin-yang sign" (B) associated to a distal end femoral exostosis (arrow).



Figure 2: Coronal view CT angiography: Left popliteal artery saccular aneurysm.

The involvement of the popliteal artery is the most common site of vascular complications (91% of cases) due to its proximity to the distal femur and proximal tibia, the most common sites of osteochondroma formation [4].

In its popliteal location, exostosis is often asymptomatic but may be revealed by more specific symptoms, such as chronic pain and knee edema.

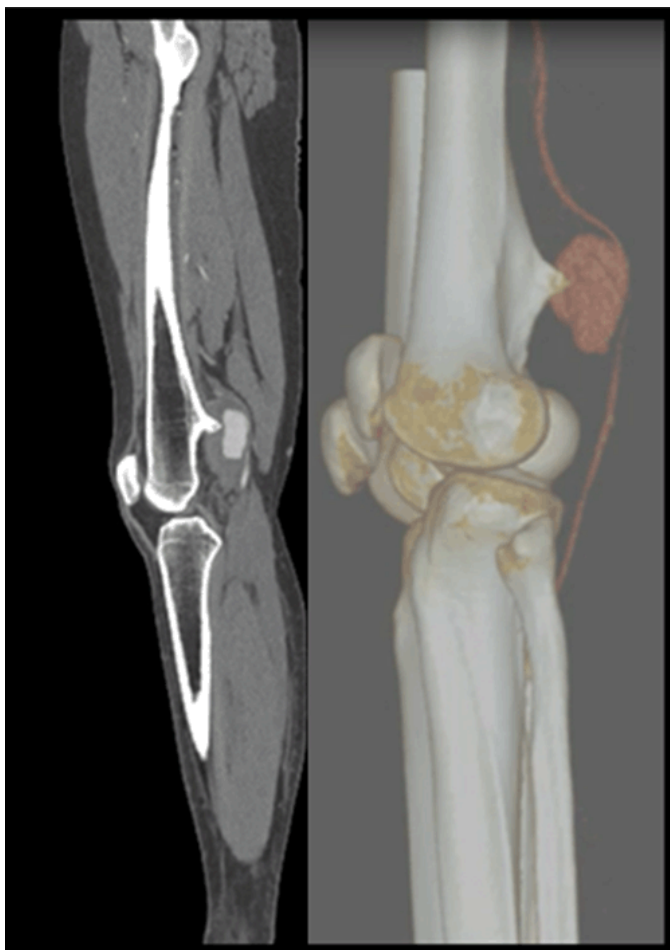


Figure 3: Sagittal MIP and VRT, C+ arterial phase: Partially thrombosed left popliteal artery sacular aneurysm and a distal solitary femoral exostosis.

In other instances, vascular complications may be revealed by more specific clinical manifestations including painful pulsatile mass associated with hematoma, functional abnormalities, edema, neuropathic pain, phlebitis and acute distal ischemia [5].

The role of radiology is to diagnose osteochondromas and to evaluate its cartilaginous cap, its relationship to the adjacent structures as well as the prevention of further complications.

Radiological features of osteochondromas are often pathognomonic; the protuberance is composed of cortical and medullary bone with an overlying hyaline cartilage cap in continuity with the underlying parent bone cortex [6].

Doppler US helps establish the diagnosis. A typical swirling motion called the “yin-yang sign” characterizes blood flow within a cystic structure. However, this flow pattern could be seen in sacular aneurysms, so a diagnosis made on this finding alone may prove to be inaccurate.

The diagnosis hallmark is the demonstration of a communicating channel (neck) between the sac and the

feeding artery with a “to-and-fro” waveform at duplex Doppler US.

Sonography also play a role in the measurement of the cartilaginous cap thickness, which appears as an hypoechoic mass adjacent to the exostosis. CT angiography is a valuable diagnostic tool for the detection of vascular complications: Non-enhanced CT scans show a low-density ovoid or round well-defined structure contiguous to the donor artery.

A high density (hemorrhage) adjacent to the pseudoaneurysm indicates rupture, which vary in attenuation depending on its chronology. After the administration of Contrast material, we observed the total filling of the sac and the communication with the donor artery [7]. A finding, absent in case of total thrombosis or stenosis of the pseudo aneurysm.

Endovascular treatment is comprised of image-guided occlusion of the pseudo aneurysm with coils it conserve its indication for aneurysms with a narrow neck. However, this method of treatment is not recommended for this age group due to its short duration and the possibility of recurrence [8, 9].

Surgical vascular reconstruction and excision of the adjacent osteochondroma is the treatment of choice in symptomatic patients. Urgent surgical treatment of vascular complications is needed in order to prevent the occurrence of irreversible damages such as distal vessel occlusion or pulmonary embolism.

In our case, the juxta articular localization, the patient young age, the wide collar of the pseudoaneurysm and especially the need for a same-time tumor resection prompted the need for a surgical treatment. Follow-up exams are mainly composed of plain radiographs for the bone lesions and US for distal vascular complications [10]. In our case, no vascular complications were noted during our 24 months follow-up.

CONCLUSION

Pseudoaneurysms are common vascular abnormalities. The advent of new non-invasive diagnostic imaging techniques with increased sensitivity for asymptomatic disease has led to more frequent diagnostics. Although image guided methods are recommended for peripheral arteries aneurysms. In our case surgical treatment was prompted for the treatment of bony lesions.

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Author Contributions

Lamia e Bouimetarhan – Acquisition of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

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Guarantor of Submission

The corresponding author is the guarantor of submission.

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Consent Statement

Written informed consent was obtained from the patient for publication of this case report.

Conflict of Interest

Authors declare no conflict of interest.

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