

Persistent Sciatic Artery Aneurysm: A Rare Cause of Subacute Lower Limb Ischemia in Department « B » of Surgery of the Teaching Hospital Point « G » Bamako

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ABSTRACT

The persistent sciatic artery is a rare congenital anomaly. Its clinical presentation may be related to an aneurysmal degeneration with complications such as sciatic compression with neuralgia, thrombosis or distal embolization. A 56-year-old tailor was referred to our department for a painful right gluteal mass radiating to the posterior aspect of the thigh and ankle that was considered as sciatic L5-S1. Three weeks before his admission, limb edema with a cyanotic aspect of the foot was associated with the clinical signs. An ultrasound duplex revealed an aneurysm of the Superior gluteal artery. The CT angiography concluded an aberrant aneurysmal sciatic artery mean vascularized the limb. Revascularization surgery by saphenous vein femoro-popliteal bypass associated with aneurysmal resection was performed in a timely. With a follow of 4 years, the patient is well. Ultrasound duplex and CT angiography control shows perfect suppression of the aneurysm with vascular patency of the limb. The rarity, the diagnostic and therapeutic difficulties motivated this case report.

Keywords

Persistent sciatic artery, Aneurysm, Acute ischemia, Surgery.

Introduction

Persistent sciatic artery (PSA) a rare vascular anomaly resulting from incomplete obliteration of the sciatic artery during development was first described by Green in 1832 [1]. Its persistence can be complete or incomplete, unilateral or bilateral and can predispose to atherosclerotic and aneurysm degenerate. Persistent sciatic artery aneurysm (PSAA) was first described by Fagge CH in 1864 followed by Bryan RC in 1914 [2,3]. This degenerate aneurysm may cause significant complications, such as rupture, thrombosis, distal embolism, and sciatic neuralgia [4]. In lack of proper diagnosis and appropriate management, it can result in severe ischemic event with limb loss or death [5,6]. The treatment options are variable due to the anatomy form and different

complications involved. Previously reported methods of surgical treatment are proximal ligation only, excision with interpositional grafting, and proximal and distal ligation with femoropopliteal bypass grafting [7]. In recent decades, the endovascular option has been used for the treatment of persistent sciatic artery aneurysm [8,9]. We present a complete persistent sciatic artery aneurysm with subacute ischemia of right leg successfully treated with conventional surgery in a developing country.

Case Report

A 59-year-old tailor with history of hypertension treated with beta-blocker, non-smoking, prostate adenoma surgery presented for 3 months a progressive right buttock pain radiating to the lower limb up to the ankle. The orthopedic-traumatologist physician treated him as sciatica pain. Three weeks before his admission he has observed edema with numbness and cyanotic skin on the foot associated with total functional limb impotence. After performed

duplex ultrasound that concluded a superior gluteal aneurysm, the patient was referred in our institution.

On physical examination, we observed an ischemical appearance, flaking skin, edema and paresthesia of foot. There was a pulsatile mass in the right buttock. Femoral and popliteal pulses were felt in right limb. However, the posterior tibial pulse was decreased and the pedal pulse were absent. There was no anomaly in the left limb. CT angiography revealed an aberrant sciatic artery aneurism 10 cm in diameter without thrombus continuing in popliteal artery and ensuring the main vascularization of the lower limb (Figure 1). Moreover, the external iliac and femoral arterial axis had a satisfactory diameter compared to left side. The superficial femoral artery was hypoplastic and ended to the adductor channel without connection with popliteal artery. At the leg level, the anterior tibial artery is occluded from its' origin. The posterior tibial artery and the peroneal artery are patency but with atherosclerotic lesions. With regard to the clinical presentation and the results of the CT scan, we concluded a complete persistent sciatic artery aneurysm with subacute ischemia (Rutherford IIb) of the right lower limb.

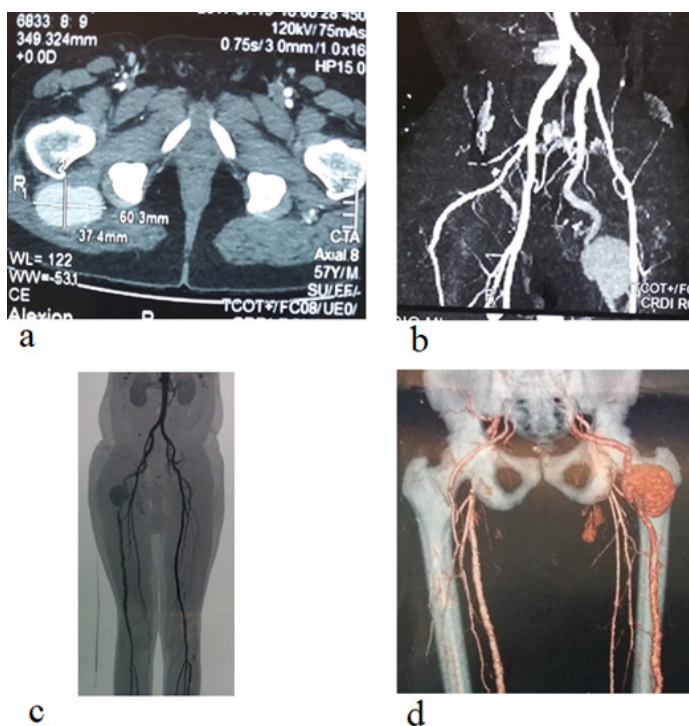


Figure 1: Preoperative angioscannographic images.

- Axial section image of a large aneurysm of the persistent sciatic artery.
- Persistent sciatic artery terminal branch of internal iliac artery
- Persistent sciatic artery aneurysmal providing the main vascularization of the limb
- Persistent sciatic artery aneurysmal with atheromatous degeneration.

The patient was treated with a bypass from common femoral artery to popliteal artery with use of the ipsilateral reverse

greater saphenous vein. At the same time, we performed ligation and flattening of the aneurysm. We performed a retroperitoneal approach to control the internal and external iliac arteries to its' origin. After femoro-popliteal bypass, the patient was then placed in a left lateral position and we performed a buttock approach to exclude aneurysm by proximal and distal ligation associated to flattening aneurysm. The patient made an uneventful recovery and was discharged home on day 7. The duplex ultrasound control at the exit and after 6 months showed a perfect patency of the bypass. CT angiography performed at 6 months post operatively showed the perfect exclusion of the aneurysm as well as a patency of the bypass (Figure 2). He remains well 4 years post operatively with no lower limb ischemia, no sciatic nerve damage or no evidence recurrence of aneurism.

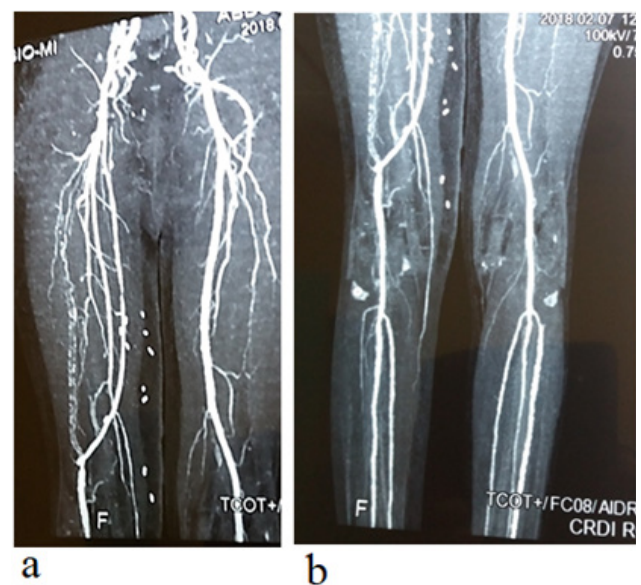


Figure 2: CT angiography control after femoro-popliteal bypass surgery, flattening and aneurysm.

- Patency of Femoro-popliteal bypass with perfect aneurysm exclusion.
- Perfect distal popliteal bypass anastomosis with patency of the limb arterial system.

Discussion

Persistent sciatic artery (PSA) is a rare vascular anomaly resulting from incomplete obliteration of the sciatic artery during development with an incidence evaluated between 0.03% and 0.06% of the population [9]. The bud of the arterial system of the lower limb appears at the 5 mm stage of embryonic development. At the 9-mm stage in embryological development, sciatic artery or axial artery, direct continuation of the internal iliac artery, which in turn originates from the umbilical artery, is the major blood supplier to the lower limb. As development progresses, the sciatic artery involutes and the superficial femoral artery, developing from the external iliac arteries, becomes the main arterial supply of the lower limb [10]. The exact cause of this malformation remains unknown but incomplete regression of the sciatic artery during development or failure of the femoral artery to fully develop may

be contributing factors. A bilateral form can be observed in 12-30% of case [11]. Bower and al. [12] have first made a practical classification of PSA into complete or incomplete. However, Pillet J [13] classification's modified by Gauffre S and al. [14] remains widely used today. In a complete PSA as in this presentation, the sciatic artery is the dominant blood supplier to the limb and it has continuity from the internal iliac artery to the popliteal artery. The superficial femoral artery (SFA) is hypoplastic ending in the mid-thigh. In an incomplete PSA, the SFA remains the dominant blood supplier to the lower extremity, with the PSA becoming hypoplastic in the mid-thigh. Complete PSA with 63-80% is the most observed form in literature [7,9]. It is known that the persistent sciatic artery is predisposed to early atherosclerotic degeneration and aneurysmal formation. This Aneurysmal degeneration is reported in 40-61% of PSA [4,12]. Several factors acquired and congenital including recurrent trauma in the gluteal area as a result of compression of the PSA against the sacrospinal ligament, piriform muscle, and hip, as well as frequent stretching during flexion of the hip, hypoplasia of elastin fibers in the arterial wall and predisposition to atherosclerosis have been implicated in the genesis of aneurism formation [7,8,15]. In this patient, we thought that his profession of tailor can be considered as an important factor in the genesis of the aneurysm. Also in the presence of cardiovascular risk factors, an atheromatous aneurysm degeneration is possible. The clinical presentation of persistent sciatic artery aneurysm (PSAA) is varied and non-specific. It is most often asymptomatic. As in this case, the aneurysmal form can manifest as a pulsatile and painful gluteal mass or its complications as sciatic nerve compression, thrombosis or distal embolization. In this patient, we thought that these symptoms were related to subacute arterial ischemia secondary to the leg vascular injuries by distal embolization of the aneurysm of the persistent sciatic artery. Stepping walk would be related to compression of the sciatic nerve by the gluteal aneurysmal mass.

Duplex ultrasound can add significant information if the condition is suspected. The size of the aneurysm, the presence of the thrombus, and the size of the ipsilateral greater saphenous and superficial femoral veins can be assessed. In this case, Doppler ultrasound revealed this vascular gluteal mass and its referral to a specialist department.

Computed tomography (CT) angiography and magnetic resonance angiography (MRI) are helpful in planning the operation because they can determine whether the proximal neck of the aneurysm is inside or outside the pelvis and whether an additional trans peritoneal or extra peritoneal approach is needed for its control. An angiogram is always obtained to delineate the anatomy and the pattern of PSA and to evaluate the status of the peripheral runoff vessels. Angiography can distinguish between PSAA and aneurysm of the gluteal artery, which can be treated with simple ligation without ischemic consequences. Effectively, in the absence of magnetic resonance imagery (MRI) and angiography in our institution, a CT angiography with image reconstruction was used to establish the anatomical diagnosis, the classification and to plan the surgical strategy.

PSAA, even asymptomatic, needs to be addressed because of the high risk of thromboembolic complications. The choice of treatment depends to anatomic classification as complete or incomplete form and the patient's symptoms. Considering the clinical symptomatology related to subacute arterial ischemia and possible sciatic nerve compression, an urgent indication for revascularization was necessary to save the limb in this case.

Many treatment options are available when a persistent sciatic artery has had aneurysmal degeneration [6]. Frequently prior treatment option were open classic surgery included exclusion of the aneurysm by proximal and distal ligation with femoral popliteal bypass. Management of complete PSAA formation requires both revascularization and aneurysm exclusion, whereas for incomplete sciatic artery aneurysms performed proximal and distal ligation is appropriate. Revascularization techniques reported include the PSA-based procedures or exclusion of the PSA with a bypass surgery. The most common was femoropopliteal bypass. We performed in this case a reverse saphenous vein femoro-popliteal bypass followed by exclusion and flattening of the aneurysm during the same operation. In the intra pelvic position the aneurysmal neck can be controlled with a trans or extra peritoneal route, thus increasing the magnitude of the operation and the risk of complications. If the aneurysm is completely extra pelvic, some authors recommend the posterior trans gluteal approach. We realized a combined extra peritoneal and trans gluteal in this patient. This classical approach was guided by the insufficiency of the technical platform also by the difficulty of access to a vascular prosthesis. In past decade, some authors showed good results with endovascular stent graft repair of persistent sciatic aneurism [8,11,16]. The benefits of this approach include a less invasive procedure, single intervention, and decreased risk of sciatic nerve damage. In the developing countries, the accessibility to these new techniques is a major challenge. Even more challenging, as in our case, is the treatment of patients who present with acute ischemia. Untreated or in the late stage of ischemia, PSAA can lead to limb loss. Whatever the therapeutic approach, regular and long-term monitoring is essential to detect recurrences or assess the bypass patency.

Conclusion

Although a rare congenital anomaly, PSAA can be a cause of acute ischemia that poses a risk of lower limb amputation. Early diagnosis and appropriate surgical management saves the limb. Despite the evolution of endovascular techniques, conventional revascularization by exclusion or flattening followed by peripheral bypass surgery in saphenous vein remains a preferable option in most cases.

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