Posterior Tibial Artery Aneurysm

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True posterior tibial artery aneurysm is an extremely rare pathology. A fifty-three-year-old Bahraini female presented with a pulsatile mass behind the left medial malleolus for one year duration. Arterial duplex and angiogram revealed a true saccular aneurysm of the posterior tibial artery. The aneurysm was resected and the posterior tibial artery was reconstructed with end-to-end anastomosis.

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An aneurysm is a permanent, localized dilatation of a blood vessel with at least 50% increase of its expected normal diameter[1]. Aneurysms are considered either true or false based upon the involvement of blood vessel wall layers[2]. Pseudoaneurysms are more common and usually secondary to trauma[3-7]. The infrarenal aorta is the most common site of the arterial aneurysms[8]. The incidence of infrapopliteal aneurysms is very rare[9]. The most serious complication of the aneurysms is rupture, which could lead to death. Other complications include thrombosis, embolism and compression of adjacent structures[10]. We present an extremely rare case of a true posterior tibial artery aneurysm, which to the best of our knowledge is the twenty-first case report in the English literature.

The aim of presenting this case is to increase awareness of posterior tibial artery aneurysm and its management.

THE CASE

A fifty-three-year-old female presented with a history of a painful pulsatile mass in the medial aspect of the left leg for one year. In the last four months, it increased in size and had become painful. There was no history of trauma, and the patient's past history is not significant. On examination, there was a 5x3 cm size pulsatile mass behind the left medial malleolus. Pedal pulses were palpable. There was no evidence of any other aneurysm on clinical examination. Ultrasound of the left lower limb revealed a posterior tibial artery (PTA) aneurysm. An angiogram was performed which confirmed a saccular PTA aneurysm with patent pedal arteries. An aortoiliac aneurysm was excluded by abdominal ultrasound. Laboratory investigations including erythrocyte sedimentation rate (ESR) were normal.

The patient was symptomatic and the aneurysm was large; because of that, the patient was scheduled for surgical intervention. The aneurysm was resected and primary end-to-end anastomosis was performed, see figures 1 to 3.

Figure 1: Exposed Posterior Tibial Artery Aneurysm

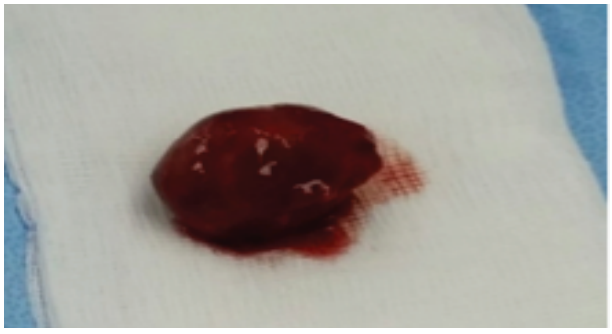

Figure 2A

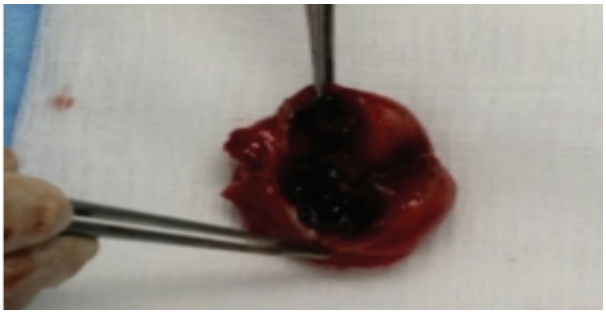

Figure 2B

Figures 2 A and B: Resected Posterior Tibial Artery Aneurysm Occupied with a Thrombus

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Figure 3: Primary End-To-End Anastomosis of Posterior Tibial Artery Aneurysm

Histopathology of the resected aneurysm did not reveal evidence of connective tissue disease, arteritis, vasculitis or infection. There was no postoperative complication and pedal pulses were palpable. The patient had uneventful postoperative period and was discharged home.

DISCUSSION

True tibial artery aneurysms are considered rare[11]. Two-thirds have involved the PTA, the remainder has been found in the anterior tibial arteries[12]. Most of the cases are false aneurysms. There have been only few case reports of true PTA aneurysms published[13]. Most of the true aneurysms are associated with an inflammatory or infectious process[14]. Two cases of bilateral true aneurysms of the PTA were reported[11,15]. The coincidence of idiopathic PTA aneurysm with other aneurysms is unique and was reported only in one case[15]. We have observed that the majority of reported cases with PTA aneurysms were males.

To our knowledge, only twenty cases have been reported in the English-language literature, and there are no reported cases in the GCC region. The exact etiology is unclear; however, many conditions were hypothesized as leading factors: trauma, collagen vascular disease, atherosclerosis, fibromuscular dysplasia, infection and inflammation. The most common clinical presentation is an asymptomatic lump[16]. Complications of PTA aneurysm, such as paresthesia or rupture are rare[17,18]. Only one case of ruptured PTA aneurysm was reported[19]. Tshomba et al reported 9% of infrapopliteal aneurysms presented with critical distal ischemia, which resulted in mid-foot amputation in two-thirds of cases, whereas only 3% of cases have developed acute compartment syndrome as a sequel of rupture[18]. Differentials include tendon cyst, neuroma or soft tissue tumor[20].

In this case, we could not reveal the cause of the aneurysm formation. Out of reported cases of true PTA aneurysms, eleven cases were idiopathic[12,14,16,21-26]. Four cases were reported secondary to collagen vascular disease including Ehlers-Danlos syndrome and lupus-like syndrome[12,27-29]. Three cases were secondary to mycosis with underlying infective endocarditis, and another two cases were secondary to atherosclerosis[18,19,30-32]. Polyarteritis nodosa was the etiology in one case, and syphilis in another; however, diagnosis was not confirmed by culture and immunostaining[17,33].

The treatment options vary from conservative to surgical. The surgical approaches include excision of the aneurysm with saphenous interposition vein graft or end-to-end anastomosis, ligation and endovascular treatment. The indications of surgical intervention are debatable. There is no standard approach for the management of such aneurysms due to the scarcity of such cases[34]. The management is mainly related to the presence or absence of symptoms. Usually, symptomatic aneurysms, large asymptomatic aneurysms or those with laminated thrombus should be treated to avoid the risk of compromise of the distal circulation or rupture[22,34]. There are reported cases of asymptomatic infrapopliteal aneurysms in the literature that has been closely observed for many years without any complications or symptoms[23,32]. Surgical or endovascular treatment depends on the location, shape and size of the aneurysm, as well as the patient's general condition[18,35].

Endovascular treatment is a good alternative to surgery and should be reserved for selected high-risk patients with symptomatic aneurysms when open repair is not feasible or difficult[29,35,36]. Coiling is probably the safest intervention compared to stenting[37,38]. Primary repair or venous interposition graft placement following surgical excision of the PTA aneurysm is the preferred treatment[14]. Surgical ligation of the PTA is an alternative choice which may be reserved for emergency circumstances in the absence of distal ischemia[13, 14].

Out of twenty reported cases, eleven patients had surgical excision of the aneurysm with venous interposition graft placement and five patients had PTA ligation[13-17,19,20,22,23,25,27,31,32]. One patient had primary end-to-end anastomosis following surgical excision of the aneurysm[18]. Three patients had endovascular treatment due to some difficulties and limitations[22,28,29].

Our patient had symptomatic uncomplicated PTA aneurysm with no underlying co-morbidities and the anterior tibial artery was intact; therefore, surgical excision with end-to-end anastomosis was feasible and a non-risky procedure. Despite the minimum risk of complications, we believe that even asymptomatic infrapopliteal aneurysms should be treated to avoid unnecessary long-term follow-up in the clinics which is not a comfortable option for the patient.

CONCLUSION

This is the first reported case in the Kingdom of Bahrain and in the GCC region. Incidence of a true posterior tibial artery aneurysm is very rare. Treatment should be individualized according to patient status.

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