Giant True Profunda Femoris Aneurysm: Case Series and Literature Review

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Abstract

True Profunda femoris artery aneurysm is extremely rare. Its lateral and deeper location in upper thigh causes delayed indentification making surgical management difficult. Mainstay management technique is surgical with excellent long term outcomes. We report our experience of a 18 cm giant profunda femoris true aneurysm management and review the literature.

Key Words: Giant profunda aneurysm, profunda femoris aneurysm, true aneurysm

Introduction

True profunda femoris artery aneurysm (PFAA) are extremely uncommon accounting for 1%–2.6% of all femoral aneurysms[1] with a tendency of occurring in association with synchronous or polyaneurysmal disease.[2] As they lie in a deeper intramuscular plane in the upper thigh, diagnosis may be late or difficult[3,4] resulting in increased complications. Surgical treatment by resection and interposition vein graft is highly effective with excellent long-term results. We report our experience of the management of a case of giant PFAA and review the literature.

Case Report

A 73-year-old male retired carpenter was referred to our vascular surgical service with a history of a backache, and a palpable pulsatile left groin swelling. He was a well-controlled hypertensive and an ex-smoker with dyslipidemia. His sister had a history of a thoracoabdominal aortic aneurysm. Clinical examination revealed normal vital signs, a readily palpable abdominal aortic aneurysm with ectatic right and left femoral pulses and similarly prominent popliteal pulses. Pedal pulses were also readily palpable. There was a nontender diffuse pulsatile mass in the left groin and lateral upper thigh measuring 18 cm × 12 cm.

Duplex ultrasound examination revealed an infrarenal abdominal aortic aneurysm of a maximum diameter of 5.3 cm, bilateral common femoral aneurysms of 2.5 cm, left profunda femoris aneurysm at 14 cm × 10.3 cm with no flow into distal profunda artery. In addition, the left popliteal artery measured 3.3 cm × 2.8 cm × 2.8 cm and the right popliteal artery 3.7 cm × 3.4 cm × 3.1 cm. Computerized tomography (CT) aortogram demonstrated an infrarenal abdominal aortic aneurysm with a maximal transverse diameter of 5.8 cm, a left common iliac artery measured at 3 cm, with ectatic appearances to the right common iliac and both external iliac arteries. Internal iliac arteries were noted to be patent. Both common femoral arteries measured 2.8 cm in maximal diameter with a left profunda aneurysm of maximal diameter 14.7 cm × 11.3 cm.

The patient proceeded to have an uneventful open aortic aneurysm repair with a bifurcated Dacron graft from the infrarenal aorta to the right common iliac artery and left external iliac artery in the first instance. Arrangements were made for duplex ultrasound evaluation of the profunda femoris and popliteal aneurysms but, due to the development of an adenoid cystic carcinoma of the hard palate, requiring hemimaxillectomy, reconstruction, and postoperative radiotherapy, further follow-up, and definitive treatment of lower limb aneurysms was delayed. Five months later, the patient was admitted with severe pain in the left groin while at his work. He had tachycardia; distal pulses were well palpable, and the left groin was tender to touch and warm. The urgent duplex scan showed no evidence of rupture. At open surgery, a large

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fusiform aneurysm of the common femoral artery (CFAA) extending onto the external iliac, and a separate fusiform aneurysm [Figures 1 and 2] of the mid-main trunk of the profunda femoris artery (PFA) were identified. Due to diameter mismatch [Figure 3], CFAA was repaired with a 10 mm interposition Dacron graft, while the profunda femoris an aneurysm was excised and the occluded distal PFA was ligated. Postoperative recovery was uneventful.

Discussion

True aneurysms of the profunda femoris artery (PFAA) are exceptionally rare and estimated to account for only 0.5% of peripheral artery aneurysms.[5]

Review of the published literature relating to true aneurysms of the profunda femoris vessels describes a total of only 57 reported cases.[1-27] True aneurysms of the PFA are much more common in men than in women (19:1) with an average age at presentation of 74.5 ± 10 years.[1-8,11-18,19,21-24,26] PFAA are bilateral in only 10% of patients. 44 out of 57 patients had other associated aneurysms. Nine patients had CFAA, three had superficial femoral artery aneurysm, eleven had popliteal, twelve had abdomino-iliac, six had contralateral PFA, one had axillary, and two had intracranial aneurysm [Table 1].

Pseudoaneurysms are more common than true PFAA and are often iatrogenic in origin they have been reported following trauma, percutaneous access procedures, and following orthopedic operations involving the proximal thigh.[6]

Etiology of true profunda femoris aneurysms is unclear although they are believed to be more common in the polyaneurysmal patient.[7] Associations have been suggested with arteriosclerosis,[8] peripheral primary arteriovenous fistulae,[4] fibromuscular dysplasia,[8] connective tissue disorders like Roseman and Wyche,[4] and autoimmune conditions like polyarteritis nodosa.[4] Mycotic aneurysms have also been described.[10]

These aneurysms, being deep-seated, remain asymptomatic and are found incidentally (34.8%), while PFA aneurysms have an asymptomatic course and are not easily detected unless they are complicated with rupture or critical limb ischemia. In fact, approximately, 58% of patients present with a complicated PFA aneurysm[7] while investigating other peripheral aneurysms. Painful mass in upper thigh (11.6%), acute limb ischemia (6.9%) as a result of thrombosis or distal embolization, claudication (13.9%), and thigh pain without any mass palpable (4.6%) are not uncommon presentations. Almost a quarter of patients (27.9%) reviewed presented with rupture. They rupture more often than femoral or popliteal aneurysms,[3,12] despite postulated protection or limitation of dilatation by its deep intramuscular position.[13] We believe that the deep position only makes them present late in their clinical course rather than any protection against rupture [Table 2].

The investigation can be performed using Duplex ultrasound, CT angiography, magnetic resonance (MR) angiography, or conventional contrast angiography. Identification of collateral femoral or distal vascular disease, as well as runoff vessels, is helpful in planning operative management. Twenty-six patients (50.9%) had duplex ultrasound as a primary investigation, 25 (49.0%) had arteriogram, 15 (29.4%) had CT angiogram and one had MR angiogram. More than half of the patients (54.0%) had undergone two investigations.
Traditionally, the treatment of PFFA has been ligation and exclusion of an aneurysm. Cutler and Darling have reported the danger involved in this approach with immediate or late limb loss. Thirty out of 47 cases have been treated with ligation. More recently, this has been limited to management of ruptures only. Restoration of the profunda femoris vessels with interposition grafts, preferably autologous vein, is the mainstay of treatment. In the analyzed group, interposition grafts were used in 22 patients; eleven were vein graft, six were Dacron graft and five were polytetrafluoroethylene graft. Two patients underwent coil embolization; two patients underwent excision of an aneurysm without reconstruction, and one patient underwent covered stenting. Four cases have been treated with aortobifemoral bypass along with excision of aneurysm and one patient treated with aortoiliac bypass with ligation. One has been treated with femoropopliteal bypass grafts and exclusion of PFA. Endovascular stenting has been performed successfully although experience with this technique is limited. Our patient underwent Dacron graft reconstructions of a common femoral artery due to diameters of arteries exceeding the range for great saphenous vein with excellent outcome.

Conclusion

True PFFA is uncommon. Clinical examination may be elusive due to the deep nature of the vessel, and incidental detection during duplex scan or CT angiography is quite a common presentation. They rupture more frequently than any other peripheral aneurysms. Preservation of the profunda vascular bed with interposition grafting should be the mainstay of management where possible.

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Conflicts of interest

There are no conflicts of interest.

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