RARE PRESENTATION OF SYMPTOMATIC BILATERAL PROXIMAL POPLITEAL ARTERY ANEURYSM

Thulasikumar Ganapathy*, **Marunraj Gnanasekaran****, [1] **and Aravind Moorthy*****

*Stanley Medical College, Chennai, Tamilnadu, India, **Saveetha Medical College, Thandalam, Tamilnadu, India, ***Kilpauk Medical College, Chennai, India

ABSTRACT

True Popliteal an artery aneurysm is the most common of all the peripheral artery aneurysms. We present a case of proximal popliteal artery aneurysm involvement both lower limb presented with gangrene in one lower limb and incapacitating claudication pain on the other lower limb. We have successfully repaired both sides aneurysm in the same sitting with Poly Tetra Fluro Ethylene (PTFE) graft, as the patient also had multiple venous perforators' involvements on both sides, which left us only with synthetic graft repair option rather than venous graft repair.

KEYWORDS Aneurysm, Popliteal artery, Gangrene, Poly Tetra Fluro Ethylene (PTFE)

Case History

49 years old male patient, chronic smoker and alcoholic presented with rest pain for past two weeks and blackish discoloration of left second & third toe for past 30 days. He gave a history of intermittent claudication of both lower limbs for the past two years with a progressive decrease in claudication distance, gradually, from more than a kilometer to less than 100 meters. He is a Hypertensive on irregular medication. The patient had Myocardial infarction two years back, the coronary angiogram showed single vessel disease, hence managed medically.

On Examination, both lower limbs showed signs of Chronic arterial insufficiency with dilated tortuous superficial veins, and blackish discoloration of left second and third toe (Fig.1). Common Femoral and superficial femoral artery pulsations are felt up to mid thigh with pulsatile swelling on both legs at the level of adductor hiatus noted. Arterial pulsations were absent in both lower limbs below the level of swelling. Ankle Brachial Index was 0.4 & 0.5 in left & right leg respectively. No Marfanoid features were made out. Blood investigation showed dyslipidemia and Ejection fraction of 32% with the hypokinetic anterior wall. Blood culture was negative for pathogens.

With poor distal flow on both legs with prominent collaterals noted. No significant dilatation and/ or stenosis were made out in Aorta Iliac, common femoral and superficial femoral vessels on both legs (Fig. 2).

Surgical procedure

Considering the symptomatology and size of bilateral aneurysms, patient underwent excision of aneurysms on both sides under combined epidural and spinal anesthesia, via medial thigh approach (Fig. 3), after taking mid superficial femoral artery as a proximal control and popliteal artery as a distal control. An aneurysm was excised after clamping proximal and distal controls. Fogarty catheter was passed into the distal arterial tree for a distance of 25cm with the right backflow. Two 6mm X 20cm Poly Tetra Fluro Ethylene (PTFE) grafts were used to replace the excised aneurysmal segments in an End to End passion (Fig.4 & Fig.5). Postoperatively posterior tibial artery pulsation felt on both legs, and rest pain disappeared. Delayed amputations of the 2nd and 3rd toe on left leg are done. Histopathology report of the excised aneurysmal mass (Fig. 6) showed the presence of all layers of arterial wall with wall calcification and intraluminal organized thrombus, consistent with atherosclerotic etiology of a true aneurysm. Aneurysmal wall culture grew no pathogenic organism.

DOI:10.5455/ijsm.20151003095138
First Received: September 06, 2015
Accepted: October 03, 2015
Manuscript Associate Editor: Pavel Ninov (BG)
Editor-in Chief: Ivan Inkov (BG)
Reviewer: Vitor Gornati (BR)

[1]Marunraj Gnanasekaran, Phone: 04427239599 Mobile: 91 9445756775
drmarunanu@gmail.com

Figure 1: Gangrene left toes with dilated tortuous vein.

Figure 2: CT Angiogram lower limb showing bilateral proximal popliteal artery aneurysm.

Table 1 Multi-slice Computerized Tomogram Angiography was done showed.

Right leg	Left leg
An aneurysm at junction of distal Superficial Femoral Artery and Proximal Popliteal Artery measures 5.6 X 4.1 cm	An aneurysm at junction of distal Superficial Femoral Artery and Proximal Popliteal Artery measures 7.4 X 4 cm

Discussion

Popliteal artery aneurysms (PAAs) are rare, with a prevalence of <0.01% reported in hospitalized patients [1]. These aneurysms are the most frequently diagnosed and account for up to 70% of all the peripheral arterial aneurysms [1,2]. The proper diameter of the popliteal artery is influenced by the patient's gender, age, and the body surface, and is 6.0±0.7 mm for women and 6.8±0.8 mm for men. PAA is defined as a widening of the popliteal artery by >50% of the original diameter [2]. They can occur bilaterally, and the abdominal aortic aneurysm is simultaneously present in 40% of cases. Therefore, patients with PAAs should undergo ultrasonography to exclude abdominal aortic aneurysms and contralateral PAAs [3]. Though popliteal artery aneurysms are bilateral in more than 30% of cases, unique aspect, in this instance, is the proximal position of an aneurysm on both sides, close to adductor hiatus. Such proximal popliteal aneurysms are rarely reported [6].PAAs are most commonly caused by atherosclerosis [7]. In young patients entrapment syndrome with pre- or post-stenotic arterial dilatations by adductor hiatus [8] or by neighboring muscles or tendons [9] are commonly missed causes of aneurysms. Pseudoaneurysms due to Traumatic or iatrogenic are also reported very rarely. The main complications of PAA include local compression increasing the risk for popliteal vein thrombosis, thrombotic obstruction, embolization and rarely rupture(11).Surgical management of asymptomatic aneurysms larger than 2cm has been advocated by several authors [12]. Indications for asymptomatic patients and those with mild-to-moderate claudication are less well defined. Patients with severe claudication, resting pain, local compression, and tissue loss are considered for elective repair.

The size of an aneurysm, mural thrombus, the rate of development of symptoms, evidence of previous thromboembolism, the risk of surgical repair, and long-term surgical outcome are factors considered. Results of surgery on asymptomatic PAAs are significantly better than those for symptomatic ones [13]. The most commonly performed surgical technique for PAA repair is aneurysm excision with interposition of venous or PTFE bypass grafting, and this technique remains the gold standard. Open surgical repair is done best via medial approach with ligation and resection of an aneurysm, along with above-knee to below-knee bypass, or via a posterior approach. Endovascular repair with a stent graft is a minimally invasive alternative approach. Endovascular treatment, however, lacks long-term follow-up. Stent-graft migration and stent fracture with occlusion are possible complications.

The various devices employed for the stent-graft are relatively stiff and not ideally designed to be used in a small artery,

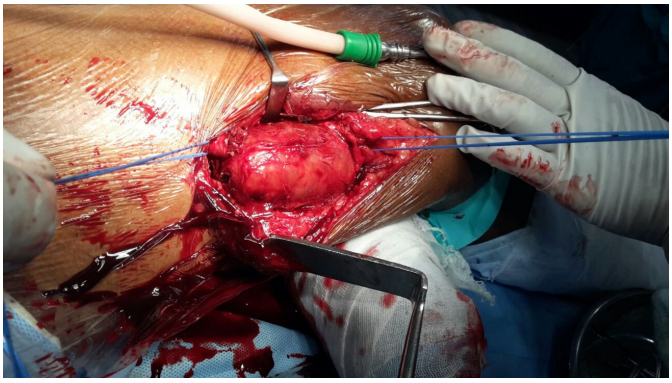

Figure 3: Intraoperative picture is showing popliteal artery aneurysm with proximal & distal controls with blue loops.

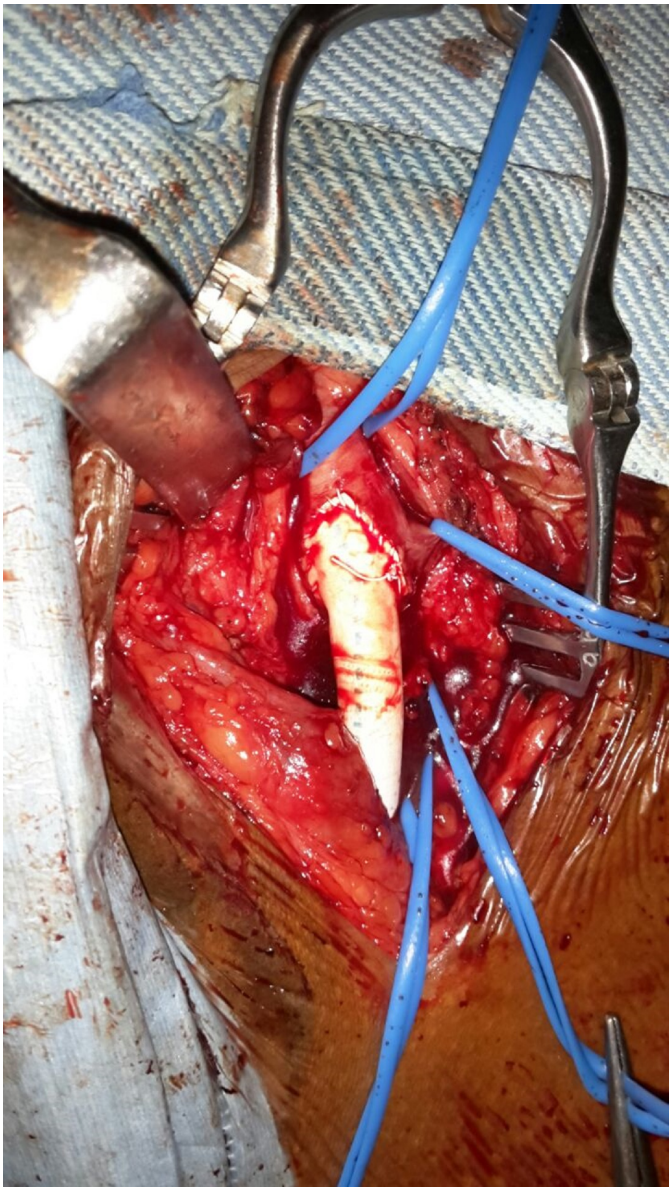

Figure 4: End of End Anastomosis of distal superficial artery to proximal popliteal artery PTFE interposition graft.

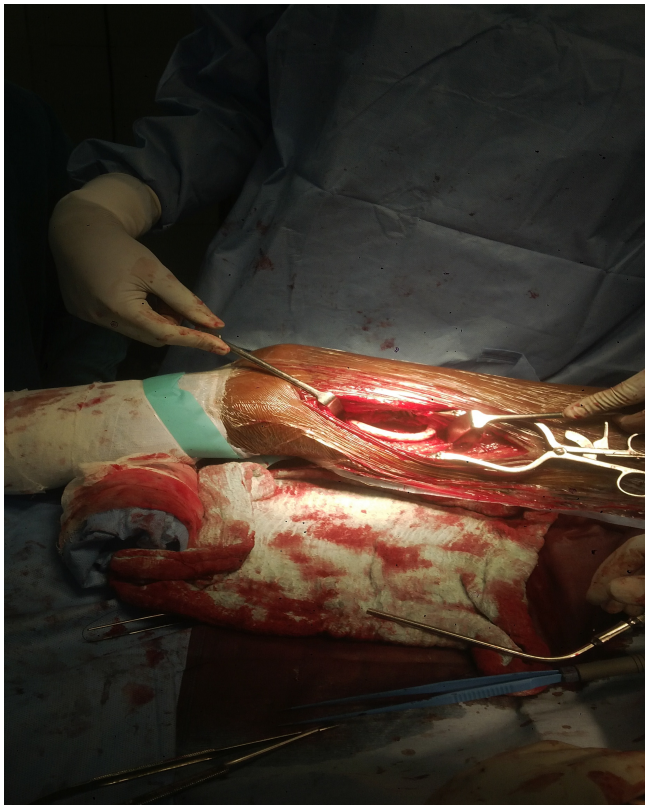

Figure 5: Completed proximal and distal End to End Anastomosis.

Figure 6: Excised Aneurysmal segment.

which is subject to repetitive flexion and extension. Several authors have analyzed the results of open surgical repair and endovascular repair. Early and mid-term patency of the popliteal artery treated by open surgery and endovascular repair has similar results, but the endovascular repair needs frequent reinterventions during the early period. Early repair in asymptomatic patients and right distal run-off gives better results than in symptomatic, thrombosed aneurysm with poor distal runoff. The great saphenous vein seems to have better durability than that of a prosthetic graft like Poly Tetra Fluro Ethylene or Dacron, which can also give satisfactory results. Thrombolysis may be used preoperatively, followed by bypass grafting. This technique has a risk for distal embolism in a popliteal aneurysm. Nevertheless, thrombolysis may be used intraoperatively to clear the calf and foot arteries, but may not be effective in dislodging well-packed clot with clearance rates of only 58% to 66%.

Disclosure Statement

There were no financial support or relationships between the authors and any organization or professional bodies that could pose any conflict of interests.

Competing Interests

The authors declare no conflict of interest.

Ethical Approval

Informed consent was sought from the parents of the patient for this study. Ethical approval was also obtained ethical committee of the hospital.

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