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BRACHIAL ARTERY ANEURYSM, UNCOMMON BUT NOT RARE

General Surgery

Dr. Manasa Das PG Trainee, Final Year, Dept of General Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar

Dr. Chandan Kumar Ray Mohapatra* Associate Professor, Department of Cardiothoracic and Vascular Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar. *Corresponding Author

Dr. Shreya Jain PG Trainee, Final Year, Dept of General Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar

ABSTRACT

Brachial artery aneurysms are clinically rare but potentially limb threatening condition. A true brachial artery aneurysm is a rare pathology to find, with an incidence of 0.17% of all peripheral artery aneurysms. This pathology can manifest with devastating complications if overlooked, however, a high index of suspicion coupled with thorough history and physical examination allows easy diagnosis. The presented cases here are two cases of brachial artery aneurysm, out of which 1 case presented with swelling over left arm to the CTVS OPD and the other was a chronic kidney disease (CKD) patient referred to CTVS department from the emergency department complaining of a sudden onset pain and bleeding from upper extremity following A-V fistula creation and closure. Three-dimensional computed tomography showed an aneurysm of the proximal brachial artery associated with arterial occlusion in its distal branch in both the cases. Embolectomy was done, the aneurysm was resected, and the artery was successfully re-vascularised by interposing a saphenous vein graft.

KEYWORDS

Brachial artery; True brachial artery aneurysm, Peripheral artery aneurysm; Saphenous vein graft, Aneurysm

INTRODUCTION

Upper extremity arterial aneurysms are though uncommon, they primarily present as false aneurysms secondary to repetitive blunt trauma, penetrating trauma, infections or iatrogenic complications [1]. True Brachial Artery Aneurysms (BAA) are even more rare to see in clinical practice [2]. Recently they have been mostly reported in association with arteriovenous access creation or repetitive punctures in end-stage renal disease patients undergoing hemodialysis [3].

Other rare causes of true aneurysm of the brachial artery include congenital connective tissue disorders, such as Ehler-Danlos syndrome, Kawasaki syndrome, Buerger disease, Kaposi sarcoma or cystic adventitial disease [4]. However, in many cases no specific cause can be identified, and these aneurysms are thus classified as idiopathic.

In most cases of BAA, they present with symptoms of median nerve compression, pain or paresthesia of the affected limb. Other symptoms may include hand or digital ischemia due to thrombosis or distal embolization. Diagnosis is often suggested at physical examination by recognizing of a pulsating mass in the upper extremity. Duplex ultrasound can usually be sufficient to confirm the diagnosis. Computed Tomography Angiography (CTA) is necessary for operative planning.[5]. Although endovascular techniques have been described in literature to manage pseudoaneurysm of the brachial artery, the treatment of true aneurysms of this artery is mainly based on a surgical approach through resection of the aneurysm and interposition of autologous veins like great saphenous vein(GSV), ipsilateral basilica or cephalic veins or prosthetic grafts (collagen-coated polyester graft) [6,7].

CASE REPORT 1:

A 20 years old male, came with chief complaint of swelling over lateral aspect of left arm for 1 year and 8 months. He had history of trauma to the left arm 2 years back. 4 months following trauma , he developed swelling over lateral aspect of left mid arm. He presented to the CTVS OPD with complaint of pain and bluish discolouration of left palm and fingers for 2 months . On preoperative evaluation , CT Left Upper Limb Angiography showed (Fig.1)

1. Pseudoaneurysm (3.5 x 1.7 x 2.9 cm) with surrounding hematoma (10.6 x 5.1 x 8.7 cm),arising from brachial artery in left mid arm.
2. Focal filling defect in brachial vein just distal to the lesion over a length of 3.7 cm – suggestive of thrombosis.

Considering clinical presentation and size of the aneurysm, decision was made to perform a surgical exclusion. Through an "S-shaped" incision at the level of the left antecubital fossa extended to the middle third of the arm, the median nerve was recognized and mobilized anteriorly, and the brachial artery was isolated proximally and distally to the aneurysm. The aneurysm was resected, and the brachial artery was reconstructed with a reverse saphenous bypass graft.(Fig. 2). An end-to-end anastomosis was performed proximally and distally with a 5/0 polypropylene continuous suture (Prolene, Ethicon). At the end of the procedure radial and ulnar pulses were present. No neurological deficits were reported. The postoperative course was uneventful, and the patient was discharged home on postoperative day 4, on single antiplatelet therapy. A 1-month follow-up duplex ultrasound showed patency of the graft and normal perfusion of the radial and ulnar arteries. At the 6-months follow-up visit the patient continued to be in good clinical conditions, with normal perfusion of the left upper limb and no neurological symptoms or pain.

CASE REPORT 2:

A 43 Year old female, k/c/o CKD stage 5D, on hemodialysis, presented to the emergency with swelling and bleeding from medial aspect of her left arm. A-V fistula was created at the same site in an outside hospital 2 months back. On examination the left upper limb swelling was approximately 10 cm in size, pulsatile with active bleeding. (Fig. 3). Bilateral radial and ulnar artery pulsations were present.

On Preoperative evaluation : RFT- Serum Urea : 136 mg/dl, S. Creatinine : 14.04 mg/dl ; Hb : 3.9 g/dl. 3 units PRBC transfusion was done in view of severe anaemia A CT-Angiography of the left arm showed a brachial artery aneurysm of 12 x 7.68 cm, left upper limb arterial doppler was done which showed patent vascularity with normal luminal colour flow in left distal radial and ulnar artery. Patient was planned for emergency exploration. An aneurysmectomy was done and reverse saphenous vein graft interposition, end-to-end anastomosis with 6.0 Prolene continuous sutures were performed under general anesthesia. The postoperative period was uneventful and the patient was discharged 10 days after surgery.

DISCUSSION:

Brachial artery aneurysms (BAA) are rare, with a prevalence of 0.5%, mostly arising as pseudoaneurysms due to trauma, infection, or medical procedures [8]. True BAAs are even rarer and are often linked to intravenous drug use, repeated arterial catheterizations, atherosclerosis, vasculitis, connective tissue disorders, such as Behcet disease, Takayasu disease, Kawasaki syndrome, Ehlers-Danlos syndrome, Buerger disease. However, one of the other causes that can be associated with true BAA is a history of A-V fistula creation [9]. Previous studies also suggest that an A-V fistula creation can increase proximal blood flow and can cause dilatation of the brachial artery

[10]. Immunosuppressive and steroid use after renal transplant may also contribute [11]. Regarding our cases, one patient had history of trauma, and other case was a CKD patient with end stage renal disease for which she underwent A-V fistula creation and closure for hemodialysis and both the patients had no history of connective tissue disorders or drug abuse. Clinically , BAA may present as a pulsating mass or cause pain, nerve compression, or, less commonly, ischemia from thrombosis. Diagnosis involves physical examination and duplex ultrasound. Surgical repair is the primary treatment, often with an autologous venous graft, such as GSV (most common); other veins or prosthetic grafts may be used if necessary [12]. In our cases, prior to the intervention, CT angiography was done and a Reverse saphenous bypass graft was considered. A good outcome was achieved postoperatively, as demonstrated by a duplex ultrasound, that showed the patency of the graft and the good perfusion of the distal arteries. A long-term follow up is necessary to better evaluate the results. Relationships between AVF creation with immunosuppressive and steroids therapy after renal transplantation and the occurrence of true BAA are not yet well defined. More dedicated studies are needed for better understand causes, evolutions and correct management of aneurysms of the brachial artery

CONCLUSION:

Aneurysms of the brachial artery are not common, but could be potentially limb threatening. True aneurysms of the brachial artery are an extremely rare disease, due to a variety of causes. There is some evidence of association between AVF creation and BAA occurrence. Immunosuppression can may also contribute to the development of aneurysmal pathology. Prompt diagnosis and proper treatment may prevent from irreversible sequelae. Surgical repair is the treatment of choice, although in some cases the endovascular approach may be considered. The use of a prosthetic graft for artery reconstruction may be a valid alternative when an autologous vein is not feasible. Further studies are needed to better understand causes, evolutions and correct management of aneurysms of the brachial artery and to evaluate long-term outcomes of prosthetic graft use.

FIGURES:

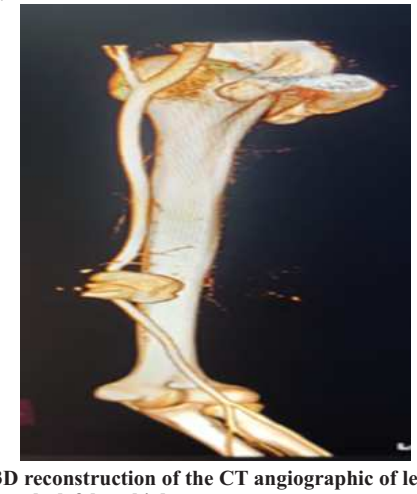

Figure 1: 3D reconstruction of the CT angiographic of left upper limb showing the left brachial artery aneurysm.

Figure 2: Intraoperative picture showing reverse saphenous by pass graft.

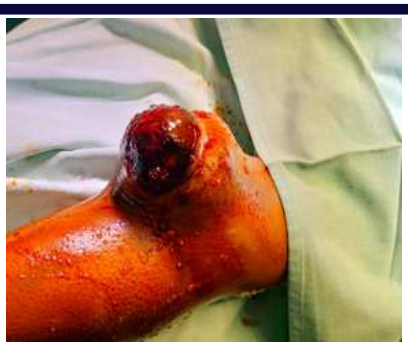

Figure 3: Preoperative image of left brachial artery aneurysm following A-V fistula.

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