

TRUE BRACHIAL ARTERY ANEURYSM, A RARE ENTITY

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ABSTRACT

Aneurysms of the upper extremity are rarer than lower extremity and among these brachial artery aneurysms are less common than those involving subclavian and axillary arteries with a reported prevalence of 0.5%. We are presenting a case of a lady presented with a pulsatile mass and on multidetector CT angiography a right brachial artery aneurysm was detected.

Key Words: True aneurysm, Brachial artery, CT Angiography

Introduction

The mechanism of aneurysm formation is considered to be insult to the arterial wall resulting in contusion in its endothelial lining with subsequent dilatation in the form of aneurysm. True aneurysms are less common than false aneurysms and rarer in upper extremity as compared to lower extremity with arteries¹ with a reported prevalence of 0.5%.¹ True aneurysms can either be fusiform or saccular.² Pseudoaneurysms or False aneurysms are caused by trauma, including iatrogenic trauma, and drug abuse.³⁻⁶ True aneurysms can occur in infantile or older age groups. Etiology consists of congenital connective tissue abnormalities, Kawasaki's syndrome, Buerger's disease, repetitive trauma, and may be idiopathic.^{4,5} Patients can be asymptomatic, or present with pulsatile mass, or ischemia due to thromboembolic complications.⁵ Ischemic changes in the limb distal to aneurysms due to shower emboli can be associated with neurological complaints, like numbness or reduced grip. CT angiography is the mainstay of diagnosis and surgical planning. True aneurysms of Brachial artery are mainly managed

with open surgical repair; however, work is being done to look for alternative methods of management. We present a case of idiopathic true Aneurysm of Right brachial artery.

Case Report

A 60 year old female, house wife, was referred from OPD to radiology department of Social Security Hospital with complaints of weakness in right arm and a pulsatile mass in the region of right deltoid tuberosity, gradually increasing for last few months. She was known hypertensive but had no history of diabetes or cardiac diseases. Past history was negative for trauma, surgery or arteriovenous (AV) fistula formation in right arm. She never got involved in drug abuse or smoking. She never got admitted in hospital in past for any complaint. On clinical examination, a large 6 cm firm, pulsatile mass was palpable in right upper arm. On examination, the temperature and color of both arms were same but the radial and ulnar artery pulses were slightly feeble on right as compared to left arm which had normal vascular tree. Neurological evaluation revealed

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reduced grip and power in right hand. Physical examination revealed normal cardiac auscultation. All laboratory parameters including, CBC, ESR, LFTs and Renal profile were within normal range. Trans-thoracic echocardiography was also normal and patient was then referred to radiology department. Doppler duplex ultrasound of right upper extremity was performed, followed by CT Angiography. Imaging was done on 64 slice Toshiba Aquillion scanner. Venous access was obtained through an 18G cannula in left antecubital fossa. 100 ml of non-iodinated contrast was given with flow rate of 4-5ml/sec. Scanning was performed with patient lying supine in the scanner having right arm placed in overhead position. Imaging was acquired from arch of aorta to terminal tufts of right hand. The raw data was transferred to Toshiba work station where post processing was done. All images including raw data axial, their coronal and sagittal reformats together with MPR, CPR and MIP images were evaluated thoroughly.

Imaging revealed saccular aneurysmal dilatation of right brachial artery just above deltoid tuberosity (Fig. 1a). The aneurysmal sac measured 52 x 41mm; it was thrombosed in the periphery and demonstrated coarse calcification of its wall (Fig. 1b). The residual

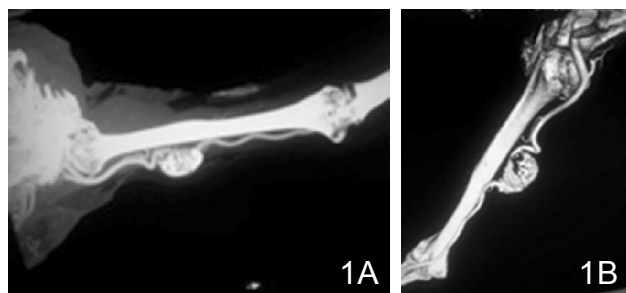


Figure 1A, 1B: MIP and VR images through Right brachial artery. There is a saccular aneurysmal dilatation from Right proximal brachial artery, demonstrating peripheral thrombosis. Contrast opacification is still appreciated in vascular tree distal to aneurysm, despite embolic filling defects in brachial artery at its bifurcation and proximal Radial and Ulnar arteries (Not shown in figure)

patent part of aneurysm measured 36 x 22mm. There had been minimal soft plaque disease for a short segment in the perianeurysmal part of brachial artery. Two tiny filling defects were seen in the distal brachial artery at bifurcation extending into origins of radial and ulnar artery that likely represented shower emboli

from the aneurysm. Right subclavian and axillary arteries were patent.

Patient was referred to vascular surgeon for further surgical management.

Case Report

An aneurysm is defined as a permanent localized dilatation of an artery with at least a 50% increase in its diameter compared with the expected normal diameter.⁷ Grossly, the extremity aneurysms are classified into false and true types. True aneurysms represent damage to the endothelial lining of the vessel with subsequent vasodilatation giving most of the time, a saccular shape to aneurysm. False aneurysms also known as pseudoaneurysms, usually form subsequent to trauma with resultant blood extravasation. A false wall forms around the collection due to granulation tissue and fibrosis which then acquires communication with the parent vessel. The true and false aneurysms mainly differ in their shapes and nature of their walls (Fig. 2). Although mostly secondary to trauma, false aneurysms can be due

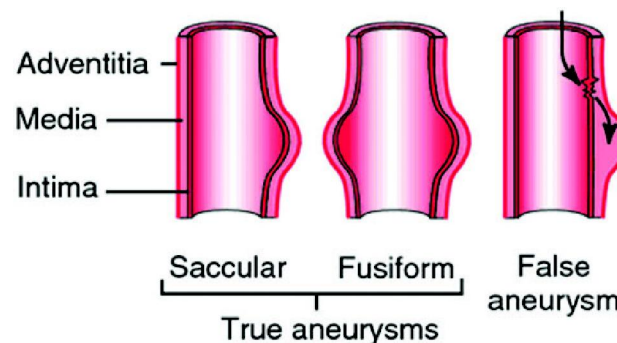


Figure 2: Classification of aneurysms. All three tunica layers are involved in true aneurysms (fusiform and saccular). In false aneurysms, blood escapes between tunica layers and they separate. From Copstead and Banasik, 2000.

to infection, IV drug abuse and vascular access line placements. Causes of true aneurysms include congenital, Metabolic, associated with systemic diseases (Ehlers Danlos, Mycotic aneurysms), Arteritis or idiopathic. True aneurysms are much rarer as compared to false aneurysms and further rarer in upper extremity as compared to lower extremity. Our case was unique in the sense that it was a true brachial artery aneurysm, obviously in upper extremity; a brachial artery aneurysm usually presents

as a pseudoaneurysm and rarely as a true aneurysm. There had been no history of trauma or any systemic disease and the age of patient suggests the acquired nature of pathology.

Aneurysms involving upper extremity can have various clinical manifestations. Most of the patients visited the hospital with a pulsatile mass in the antecubital space.⁸⁻⁹ Our patient too presented with a large, upto 6 cm pulsatile mass in upper arm with developing weakness in right upper extremity. Doppler ultrasonography, computed tomographic arteriography (CTA), and selective upper extremity angiography can be performed for establishing the diagnosis of aneurysm.¹⁰ But, CTA is the preferred method for diagnostic evaluation of upper limb vascular diseases, due to its high imaging capacity, no arterial invasion, and absence of radiation exposure. In our case, we initially did Doppler ultrasound, followed by CTA to evaluate the aneurysm thoroughly and to look at the condition of rest of the vascular tree.

Generally, patients are scanned in the supine position with the extremity of interest over the head with the palm ventral and fingers extended and straightened. Adequate IV access is very important so as to achieve good flow rate which is mandatory to acquire complete opacification of the vessels. This is obtained with an 18- or 20-gauge catheter in the antecubital fossa of the contralateral arm.

In our institution, we perform upper extremity CTA on 64- MDCT dual-source Toshiba Acquillion scanner. Non iodinated contrast medium (around 100 ml for an avg. build adult) is injected with flow rate of 4-5ml/sec followed by a saline flush of 20 cc. This saline injection reduces streak artifacts and also helps in proper opacification of vascular tree. Imaging can be continued in the venous phase if required.

Since the brachial artery aneurysm is a rare disease globally, the exact surgical procedure and definite treatment option for true upper extremity artery aneurysm has not been established.⁶ Operative repair is, however, considered to be a preferable option. In our case also, patient was referred for open vascular surgery.

Recurrence of the brachial artery true aneurysm is very rare and only a few cases have been reported in literature so far.

Conclusion

Upper-extremity peripheral artery aneurysms are rarely encountered. While all brachial artery aneu-

rysms are rare, true aneurysms of the brachial artery are even more unusual.³ Most common complication is distal thrombo-embolism with resultant ischemia. CT Angiography with good flow rate of contrast is the diagnostic method of choice. The best therapeutic option is operative repair, which should be carried out as soon as possible to avoid ischemia and limb loss.

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