A Rare Case of Blunt Trauma Induced Brachial Artery Pseudoaneurysm

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Section: Musculoskeletal system
Area of Interest: Vascular
Procedure: Diagnostic procedure
Imaging Technique: Ultrasound
Imaging Technique: CT-Angiography
Special Focus: Aneurysms Case Type: Clinical Cases
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Patient: 25 years, male

Clinical History:

A 25 year old male patient presented with complaints of pain and swelling near medial aspect of left cubital fossa following a blunt trauma two weeks prior. On examination the swelling was pulsatile in nature and a systolic bruit was appreciable on auscultation.

Imaging Findings:

Colour doppler ultrasound of left upper arm revealed a patent pseudoaneurysm originating from the brachial artery measuring approx 10 by 6mm. The aneurysm was surrounded by a hypoechoic soft tissue (probably a haematoma) of 8mm thickness. Distally the radial and ulnar artery showed normal flow velocity with no evidence of stenosis.

These findings were also appreciable on CT angiography of upper limb.

Discussion:

Pseudoaneurysm of the upper extremity is rarer as compared to the lower extremity. Pseudoaneurysms or false aneurysms are formed usually as a sequelae to trauma resulting in penetration of the vessel followed by haemorrhage and extravasation. They lack all the 3 layers of the arterial wall. True aneurysms are formed when the vessels are damaged and lead to dilatation and have all the 3 layers- intima, media and adventitia.

In most cases, brachial artery aneurysms are pseudoaneurysms. Causes for brachial artery pseudoaneurysms are broadly classified into 3 categories: [1] Congenital; [2] Traumatic e.g iatrogenic, penetrating or blunt injury, humerus fracture, supracondylar fracture, crutch use etc; and [3] Systemic causes e.g. Ehler Danlos syndrome, Kawasaki Disease, Mycotic aneurysm, Behcet's disease, Giant cell arteritis etc.

It takes weeks to months for a brachial artery pseudoaneurysm to form. Patients usually present with induration, pain and an expanding pulsatile swelling which is accompanied by a systolic bruit on auscultation. There are various modes of diagnostic imaging including doppler ultrasonography, Angiography, CT Angiography and MRI. Selective arteriography is considered the gold standard, but because doppler ultrasound is faster, cost effective, non-invasive, and more readily available, it is the preferred modality of choice. Doppler ultrasound usually demonstrates a turbulent flow with vessel dilatation.

Early Diagnosis of upper limb pseudoaneurysms is of utmost importance as they are known to cause thromboembolism, leading to ischaemia and gangrene, and finally resulting in amputation. Other complications include neurapraxia, compartment syndrome, rupture and haemorrhage. [1, 2, 3]

There are several treatment options for pseudoaneurysms based on size, location and accessibility. Small
pseudoaneurysms can be treated by Ultrasound Guided Compression (USGC). It is also the first line treatment for non-operative pseudoaneurysms. In this technique pressure is applied by the transducer over the center of the neck of the pseudoaneurysm until flow is stopped for about 10-20min and then slowly released. If the flow resumes, the pressure is immediately reapplied. This is repeated until the flow into the pseudoaneurysm has completely stopped. The success rate for USGC is between 60-90%. However it has several disadvantages- the compressions are painful and time consuming, high failure and recurrence rates in patients on anticoagulation. Other newer non-invasive techniques include- percutaneous injection of thrombin and endovascular covered stent exclusion. When pseudoaneurysms are large, open surgery is required and these options include primary repair with sutures or a patch angioplasty, pseudoaneurysm excision, or embolisation. [3, 4, 5]

**Differential Diagnosis List:** Left Brachial Artery Pseudoaneurysm, Pulsating Haematoma, Abscess, Arteriovenous malformation

**Final Diagnosis:** Left Brachial Artery Pseudoaneurysm

**References:**


Description: Lt. upper limb colour doppler: shows a patent saccular aneurysm originating from left Brachial artery measuring 10x6mm. A hypoechoic soft tissue thickening (haematoma) is seen surrounding the pseudoaneurysm measuring 8mm in thickness. Origin: Father Muller Medical College, Kankanady, Mangalore, Karnataka, India.
Description: Ultrasound of Lt. upper limb with colour doppler showing saccular aneurysm of Lt. Brachial artery. Normal flow velocity noted in the brachial artery before the pseudoaneurysm. Origin: Father Muller Medical College, Kankanady, Mangalore, Karnataka, India.
Description: Ultrasound of Lt. upper limb with doppler showing saccular aneurysm of Lt. Brachial artery, with normal flow velocity seen distal to the pseudoaneurysm. Origin: Father Muller Medical College, Kankanady, Mangalore, Karnataka, India.
Figure 4

Description: Ultrasound Doppler of Lt. Upper Limb: shows normal flow velocity in distal ulnar artery.

Origin: Father Muller Medical College, Kankanady, Mangalore, Karnataka, India.
Description: Ultrasound Doppler of Lt. Upper Limb: shows normal flow velocity in distal radial artery.

Origin: Father Muller Medical College, Kankanady, Mangalore, Karnataka, India.
Description: Upper Limb CT Angio (Axial Sections): shows the patent pseudoaneurysm (arrow head) with soft tissue thickening surrounding it. Higher up normal flow is seen in radial (thin blue arrow) and ulnar (thick blue arrow) arteries. Origin: Father Muller Medical College, Kankanady, Mangalore, Karnataka, India.
Figure 7

Description: Upper Limb CT Angio (Coronal Views): shows the pseudoaneurysm arising from the brachial artery (blue arrow) with soft tissue thickening surrounding it (blue arrow head). Origin: Father Muller Medical College, Kankanady, Mangalore, Karnataka, India.