

Unusual Case Of Post Traumatic Subclavian Artery Pseudoaneurysm.

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ABSTRACT : Subclavian artery pseudoaneurysm is a rare entity with few cases reported in the literature. Most injuries are related to iatrogenic manipulation with catheters for canalization of central lines. In rare cases, this injury has been described secondary to a blunt trauma. We present one such unusual case of pseudoaneurysm that includes the left subclavian artery in the context of blunt trauma to the neck after a traffic accident. There were no clavicular or rib fractures, or another type of chest trauma to justify such a vascular injury.

KEY WORDS : Pseudoaneurysm; Subclavian Artery; Blunt Trauma; Color Doppler

CASE REPORT : A previously healthy 45 years old male visited the surgery outpatient department of this institute with complaints of swelling in the left supraclavicular fossa with associated overlying pain. Patient also gave a history of road traffic accident two weeks back with fall from bike followed by blunt trauma to left side of the neck by handle of the bike.

On physical examination, the patient was afebrile and hemodynamically stable with a blood pressure of 142/96 mm Hg and a heart rate of 88/min. Abdominal examination was unremarkable. On local examination, there was a pear shaped pulsatile swelling in the left supraclavicular fossa with associated overlying tenderness. The patient was referred to our department of Radio-Diagnosis for evaluation of this neck swelling.

Plain radiograph did not reveal fracture of any rib, clavicle or sternum. Visualized lung fields and rest of the long bones were normal. Hence Ultrasound of neck swelling was advised to the patient.

Grey scale Ultrasound revealed two hypoechoic cystic structures adjacent to the left subclavian artery.

The hallmark of the diagnosis was demonstration of a communicating channel (neck) between the aneurismal sac and the feeding left subclavian artery with a “to-and-fro” waveform at duplex Doppler ultrasound. The “to” component was representing the blood entering the pseudoaneurysm in systole whereas the “fro” component was representing the

blood exiting the pseudoaneurysm during diastole.

Interesting fact about our case was that this pseudoaneurysm of Subclavian artery had two 'Necks' of different sizes and both the necks were showing classic YIN YANG SIGN of pseudoaneurysm.

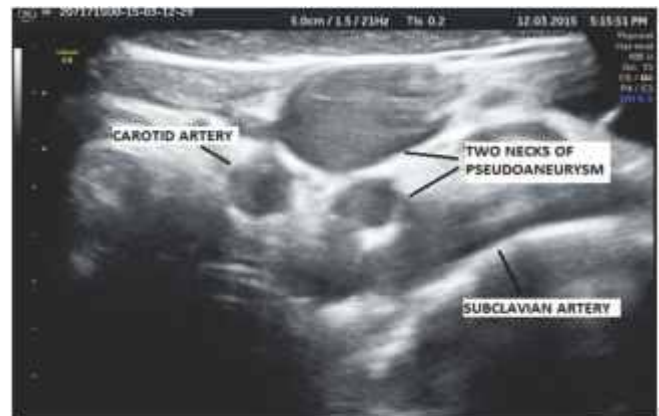


FIG.1-Gray-scale Ultrasound demonstrates two hypoechoic cystic structures adjacent to the donor subclavian artery supplying the pseudoaneurysm.

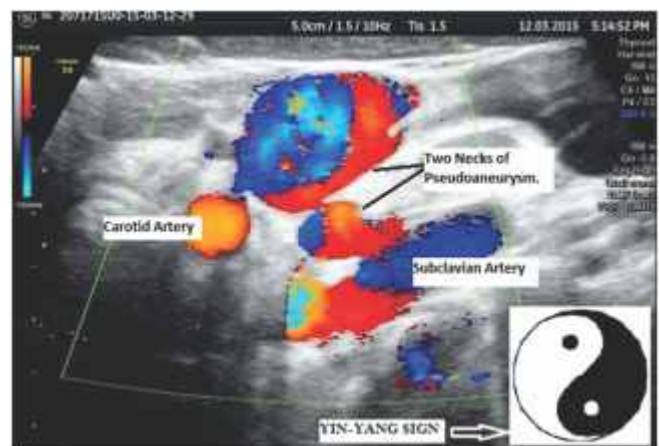


FIG.2-Color Doppler Ultrasound image of the Pseudoaneurysm demonstrates characteristic YIN-YANG SIGN (red-blue flow in the sac.)

DISCUSSION : Depending on the mechanism of formation and etiologic factors, aneurysms can be divided into True aneurysms or Pseudoaneurysms. True aneurysms are the results of vessel wall abnormalities while Pseudoaneurysms occur after vascular injuries or erosions such as in trauma or inflammation i.e. pancreatitis, autoimmune disorders, vascular intervention, laparoscopic cholecystectomy and hepatic transplantation^[1].

A Pseudoaneurysm, also termed as false aneurysm, is a leakage of arterial blood from an artery into the

surrounding tissue with a persistent communication with the feeding artery^[2].

The mechanism behind the formation of the pseudoaneurysm is the disruption of arterial continuity with extravasation of blood into surrounding tissue which results in the formation of fibrous tissue capsule which progressively enlarges because of under lying arterial pressure^[3].

The most frequent traumatic pseudoaneurysms are in the common femoral artery; the majority are secondary to arterial catheterization, infections, surgical procedures and/or radiological interventions.

Blunt trauma of the brachiocephalic vessels is relatively rare^[4]. The real incidence of lesions in the supraaortic vessels secondary to a blunt trauma is difficult to determine, being underestimated because most of the patients suddenly die and are rarely included in clinical series of vascular lesions^[5].

Subclavian artery injuries after blunt trauma to neck are very rare as this structure is protected by subclavius muscle, the clavicle, the first rib, and the deep cervical fascia as well as the costo-coracoid ligament, a clavi-coraco-axillary fascia portion.

A subclavian artery pseudoaneurysm can clinically present as a palpable, pulsatile and sometimes visible mass in the supraclavicular fossa as in our case. There is a persistent communication between the originating artery and the resultant adjacent cavity. It can produce neuro-vascular symptoms in the upper limb due to compression of the brachial plexus^[6]. This mass can compress the subclavian vein, making the venous return difficult and causing a notorious venous collateral net through the thoracoscaphular system (transverse cervical and internal mammary vessels). This collateral vascular system is able to supply, on its own, the whole upper extremity^[7]. Distal pulses can be normal, as in other vascular lesions^[8].

Among the other possible complications the worst is rupture of the pseudoaneurysm, as it threatens the life of the patient. In the series of Pairolero et al, this happened in 10% of all cases.^[9] Arterial ischemia and even cerebral ischemia (due, probably, to retrograde embolisation) are other possibilities. It is to be concluded that subclavian artery pseudoaneurysm can jeopardise both the extremity and the life of the patient.

Enlargement of a pseudoaneurysm in the subclavian artery can induce acute or chronic neurovascular

complications such as numbness, paralysis, thrombotic events of the arm.^[10-13]

Ultrasonography, Color Doppler, CT angiography, Magnetic Resonance Imaging, Magnetic Resonance Angiography can be used for the diagnosis of pseudoaneurysm.^[14] CT represents a key diagnostic exam, while selective arteriography offers both diagnostic accuracy and an operative approach.

The superficial pseudoaneurysms are diagnosed well by duplex color Doppler while the ones in the cavities like skull, thorax or abdomen needs CT scan for determination of their localization, feeding artery and relation with the surrounding structures. Large pseudoaneurysms can be detected easily on contrast-enhanced CT, whereas small lesions can be overlooked easily. In such cases, CT angiography remains the gold standard.^[15]

A double surgical approach was utilized for treatment of such pseudoaneurysms, with partial median sternotomy to control the proximal part of the subclavian artery distant to the pseudoaneurysm, and an infraclavicular incision to deal with the distal portion of the subclavian artery. This method is considered to be the most reliable and safe procedure in such an operation.

CONCLUSION : With the introduction of modern imaging modalities, the diagnosis of pseudoaneurysms has become more common, which allows early detection and therapeutic intervention before the pseudoaneurysm manifests clinically, sometimes with catastrophic results. Although conventional angiography remains the diagnostic standard of reference, other modalities such as Duplex Doppler Ultrasonography(US), Magnetic Resonance (MR) Angiography and Helical Computed Tomographic (CT) Angiography are useful in the noninvasive detection and diagnosis of pseudoaneurysms, albeit with variable results. Color Doppler is one of the foremost investigation which is cost effective and easily available which can demonstrate classical YIN-YANG SIGN in such pseudoaneurysms and aid in early diagnosis of this rare condition.

The risk of rupture of Pseudoaneurysm is higher than that of a true aneurysm of comparable size due to poor support of the aneurysm wall and thus pseudoaneurysm generally require treatment.

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