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A primary subclavian artery aneurysm successfully repaired via extrathoracic open approach: a case report

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Abstract

Subclavian artery aneurysms are uncommon; meanwhile, isolated subclavian artery aneurysms are extremely rare entities. There are limited number of reports on this abnormality, most of which are not well grounded.

The patients presenting with subclavian artery aneurysms should be evaluated thoroughly for concurrent aneurysms. Herein, we presented a case of true aneurysm of the right subclavian artery with no associated abnormalities of other parts of vascular system or any predisposing factors, previously reported in cases with this condition.

Key words: subclavian artery aneurysm, huge aneurysm



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Introduction:

The subclavian artery is the least frequent site that can be involved by peripheral aneurysms. Subclavian artery aneurysms, particularly isolated ones, are rare entities (1,2). These aneurysms have a similar etiology to that of innominate and common carotid artery aneurysms, which is a degenerative disease, often appearing as pseudoaneurysms. They less commonly result from fibromuscular dysplasia, infections (e.g., syphilis), Ehlers-Danlos syndrome, Marfan syndrome, Turner syndrome, cystic medial necrosis, vasculitis, invasion of the vessel wall by contiguous, lymphadenitis and idiopathic congenital disease.

The main causes are considered to be atherosclerosis, trauma, and thoracic outlet syndrome (3). The symptoms reported in the literature vary from a totally asymptomatic state to supraclavicular pulsatile mass or even dysphonia (2). There are limited reports regarding this issue, most of which are not well grounded. The patients presenting with subclavian artery aneurysms should be evaluated thoroughly for concurrent aneurysms (4). The aneurysms of the distal subclavian artery frequently have extension into the first portion of the axillary artery. Such aneurysms are usually associated with a thoracic outlet obstruction, cervical rib, and other bone abnormalities, which may result in localized arterial compression or post-stenotic dilation resembling a true aneurysm. Herein, we presented a case of the true aneurysm of right subclavian artery with no associated abnormalities of other parts of vascular system or predisposing factors, previously reported in case with a subclavian artery aneurysm.

Case presentation:

A 70 years-old female referred for the evaluation of a right-sided axillary and chest painful pulsatile bulging and ecchymosis from a week ago. The patient complained of a constant 24 hours pain in her hand. On physical examination, she was alert and cooperative with normal vital signs. There was an area of ecchymosis (about 10*10 cm) converting a pulsatile non-tender mass of the right axilla, extending to the lateral border of the right hemithorax. The mass could be compressed by digital pressure. Distal pulse was not palpable. There was no sign of acute or chronic ischemic changes of the right upper limb. She was unable to move her right arm and was detected with distal sensory and motor deficits.

The patient's past medical history was unremarkable. She had no history of hypertension, diabetes, ischemic heart disease or cardiovascular and collagen vascular disease. She was not a smoker and did not take any medication. Her family history was not notable as well.

Diagnostic focus and assessment:

Laboratory examination showed a hemoglobin level of 9.2 g/dl and serum creatinine level of 2.3 mg/L. computed tomography angiography revealed a right subclavian aneurysm (figure 1)



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Figure 1. – Pre-operative computed tomography scan of subclavian artery

extending to proximal part of the right axillary artery. In angiography via right femoral access, the guide wire could not be passed through the aneurysm. At operation, a supraclavicular incision was made with extension to axilla. Subsequently, the medial part of the clavicle was resected, and proximal control was obtained from the proximal part of the subclavian artery (normal part). Distal control was also obtained from the axillary artery through axillary incision. The incision made on the lateral part of the supraclavicular area exposed the subclavian aneurysm, which was ruptured and made hematoma (figure 2 and 3).

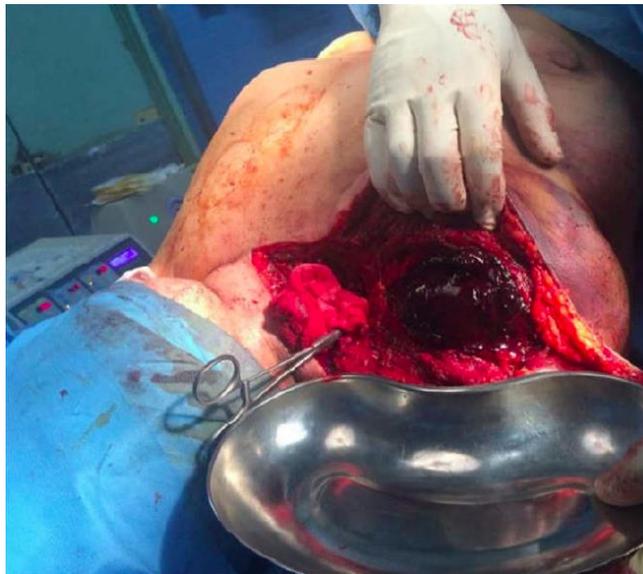


Figure 2. –Intraoperative view of subclavian artery aneurysm



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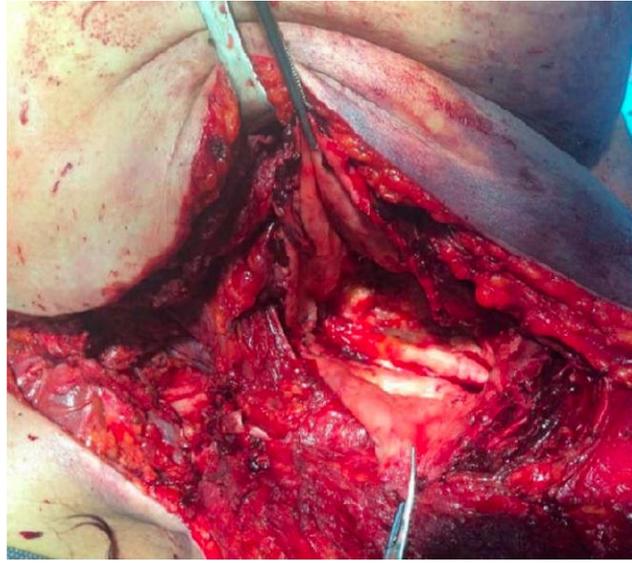


Figure 3. –Intraoperative view of subclavian artery aneurysm

There was no sign of ischemia and also very good back flow from the axillary artery; therefore, the proximal and distal ligation of aneurysm was performed through the aneurysmal sac. The patient was discharged without any complication. After a month, she was symptom-free with normal physical examination results.

Discussion:

Aneurysms can affect any arteries in human body, including subclavian artery. Subclavian artery aneurysm is a rare disease, which accounts for 0.2% of all aneurysms and 1% of all peripheral aneurysms. They are generally classified as intrathoracic or extrathoracic because both symptomology and treatment approach can differ between the two types. The range of symptoms vastly vary from a totally asymptomatic state to ischemic symptoms or signs secondary to the compression of brachial plexus, and mediastinal symptoms.

A pulsatile mass with or without a palpable thrill is one of the most reported signs of extrathoracic subclavian artery aneurysms. In addition, the shoulder or upper chest pain is another commonly reported symptom. According to the statistics, 33-47% of patients with subclavian artery aneurysm have aortoiliac or other peripheral aneurysms. Considering the rarity of this disease, almost all of the patient series and case reports have proposed angiography as the fundamental diagnostic method, especially at the time of planning a surgery for patients with extrathoracic subclavian artery aneurysms.

Subclavian artery aneurysms can be limb-disabling or life-threatening without any treatment. The operative mortality in elective cases has been reported to be lower than 5%. Surgical treatment is recommended in the literature for subclavian axillary aneurysms. In terms of etiologies, the majority of the aneurysms of subclavian artery are atherosclerotic (60%).



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In young patients, the congenital etiology has been reported. Furthermore, 10% of subclavian axillary aneurysms have been attributed to Marfan syndrome. Trauma and infections are also the other predisposing factors for the occurrence of this disease. Moreover, there are reports indicating axillary aneurysm as secondary to thoracic outlet syndrome.

Conclusion:

Our case was a previously healthy old female with no evidence of atherosclerosis in her history and no other predisposing factors for aneurysms reported in the literature. Therefore, there might be other etiologies and factors contributing to subclavian artery aneurysms. It should be noted that extrathoracic subclavian artery aneurysm can be seen without any other aneurysms, although the reports are not well grounded and further reports can help to solve this enigma.

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