SHORT REPORT

Anomalous Course of the Left Subclavian Artery Leading to Aneurysm Formation and Thoracic Outlet Syndrome – A Case Report

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Subclavian artery aneurysm is rare. Anomalous course of the subclavian artery behind the middle scalene muscle in the neck resulting in aneurysm formation is unknown. We describe a case of left subclavian artery aneurysm where the artery passed behind the middle scalene muscle producing angulation with distal aneurysm formation. It produced a visible swelling in the neck; effort related symptoms of fatigue or pain in the left arm muscles. The preoperative work-up and surgical procedure are described.

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Introduction

Aneurysms of the subclavian artery are rare.1–6 Arterial thoracic outlet syndrome, atherosclerosis, traumatic pseudoaneurysm,2 even Marfan syndrome3 have been described as an etiology. Bony cervical ribs, anomalies of the first rib are the usual causes of thoracic outlet syndrome with subclavian artery aneurysm.4–6 We describe a case of thoracic outlet syndrome where the left subclavian artery passed abnormally behind the middle scalene muscle producing angulation with distal aneurysm formation. After a careful literature review to our knowledge this is the first report describing anomalous course of the subclavian artery behind the middle scalene muscle in the neck resulting in aneurysm and thoracic outlet symptoms. This appears to be an anatomical variation, which could have developed during local myotomal grouping from paraxial mesoderm.

Case Summary

A 34 year-old man presented with a visible swelling in the left side of the neck, which developed gradually over a period of two years. He was symptomatic with history of effort related symptoms of fatigue or pain in the arm muscles and cold induced digital ischemia and discoloration. On examination, there was pulsatile left supraclavicular mass. Radial & brachial pulses were normally palpable. Adson’s test was negative on the left side, although elevated arm test was positive.

Cervical spinal x-rays did not reveal any cervical rib or any abnormal first rib. Duplex examination revealed a 5 cm aneurysm of the subclavian artery with proximal narrowing. Angiography confirmed the finding of aneurysm (Fig. 1). The arch of aorta, brachiocephalic trunk and its branches and the left carotid artery were normal.

Surgery: Transverse neck incision was made in the left side of the neck across the aneurysm with an extension over the clavicle. The aneurysm was found densely adhered to the surrounding tissues. When the dissection was made to take control of the subclavian artery proximally, the artery could not be traced in its usual position between the anterior scalene and the middle scalene muscle. It was found deep to the middle scalene muscle.
muscle in a much higher up position than usual (Fig. 2). The artery was angulated and compressed by the overlying muscle proximal to the aneurysm. The middle scalene muscle with its fibrous cord like posterior margin was carefully divided which was found compressing the underlying subclavian artery (Fig. 2). The artery was dilated distal to the constriction reaching right up to the clavicle. Axillary artery was dissected in the deltopectoral groove and taped. A subclavicular tunnel was made and the subclavian artery aneurysm was completely freed from the surrounding tissues. The aneurysm was completely excised and an expanded polytetrafluoroethylene interposition graft was placed to reconstruct the subclavian artery. In this case, there was no cervical rib. The first rib was normally located and the costoclavicular space was adequate. First rib excision was not required after scalenectomy. The patient is asymptomatic after surgery.

Discussion

Atherosclerotic aneurysm and traumatic pseudoaneurysm of the subclavian artery can be managed with resection and a primary end-to-end anastomosis with a combined supra-infraclavicular approach.\(^1, 2\) In arterial thoracic outlet syndrome, compression of the subclavian artery between the cervical rib and the anterior scalene muscle usually contributes to the development of post-stenotic dilatation or aneurysm of the subclavian artery.\(^3, 5, 7\) Management of these cases includes decompression of the subclavian artery with/without implantation of vascular bypass.\(^4, 5, 7\) The decompression consisted of resection of the osseous and muscular pathological elements.
Davis & Aburahma described subclavian artery aneurysm with cervical rib where scalenectomy was done and cervical rib was excised with arterial reconstruction. Desai & colleague in their study reviewed twenty six patients of thoracic outlet syndrome with arterial complication and showed that simple excision of the cervical rib via the supraclavicular route together with vascular reconstruction was adequate. Routine excision of the first rib was not required.

In our case, there was aneurysmal dilatation of the subclavian artery but no other vascular or osseous abnormalities were found and no obvious etiology was identified preoperatively. The anomalous course of the subclavian artery was identified during surgical exploration. On histopathology, the aneurysm showed thinning of the internal elastic lamina and muscularis externa with focal denudation of endothelial cells. Arterial decompression, aneurysmal resection and grafting were found adequate.

References

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