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PULSATING SUPRASTERNAL LUMP: A DIAGNOSTIC AND MANAGEMENT DILEMMA

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Abstract

We report a 70-year-old female who complained of shortness of breath and a pulsating suprasternal lump. CT scan showed innominate artery dilatation. In addition, operative exposure showed tortuous arteries and a common origin of the left common carotid and innominate arteries. Surgical correction by innominate artery division and reimplantation at the ascending aorta was performed, and the patient's symptoms completely disappeared after the procedure.

Introduction

Tracheal compression by innominate artery (IA) pathology is rarely encountered, with only a few cases of IA aneurysms and congenital anomalies in the literature. We report a case of IA ectasia and redundancy associated with a bovine trunk and exerting compression on the trachea.

Case report

A 70-year-old female complained of shortness of breath while lying flat and a sense of suprasternal discomfort in the upright position. There were no apparent medical diseases (cardiac and/or respiratory) that could explain these symptoms. Examination revealed the presence of a small pulsating suprasternal lump (4 cm in diameter). The lower border of the lump was not felt, denoting that the lump arose from inside the thorax. A computed tomography scan of the neck and chest suggested an IA dilatation in close contact to the trachea (Figure 1). A diagnosis of tracheal compression was made, and operative management to control her symptoms was decided.

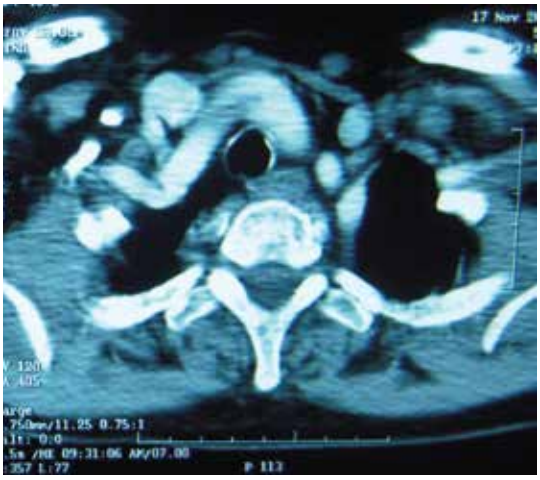

Figure 1. Neck computed tomography showing dilated and tortuous innominate artery slightly pushing the trachea from the left.

Exploration was done through a median sternotomy. Dissection of the IA, right common carotid artery (CCA), and right subclavian artery revealed very tortuous and redundant arteries making a loop after being liberated from the surrounding tissues. The IA showed mild dilatation (2 cm in diameter). In addition, the left CCA was found arising from a common trunk with the innominate artery (bovine trunk) (Figure 2). The trachea was partially released from compression after liberation of the looped arteries, but the junction of the left CCA to the origin of the dilated IA was still pressing on it.

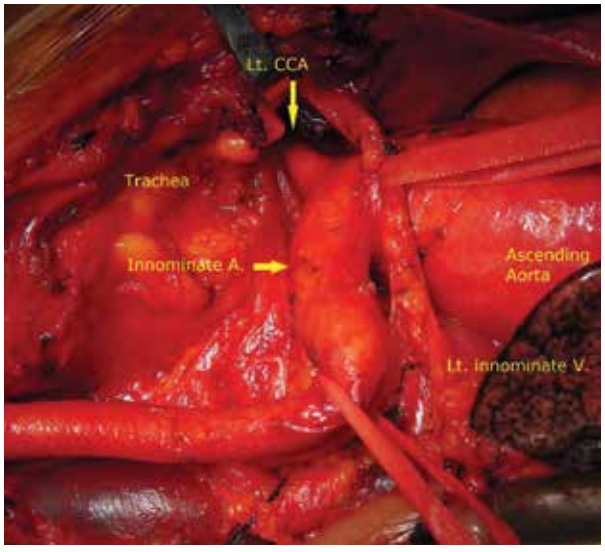

Figure 2. Operative view of the dilated innominate artery (IA), showing its redundancy and the elongated right common carotid and subclavian arteries. The common origin of the left common carotid artery with IA is evident.

The innominate artery was divided just distal to the left CCA origin, a 2-cm segment was excised to shorten its length, and the artery was reimplanted at a proximal site at the ascending aorta to straighten the redundant right CCA and right subclavian arteries

(Figure 3). The reconstruction led to a more anatomic alignment of the vessels in the neck (Figure 4). The patient's symptoms completely disappeared after the procedure.

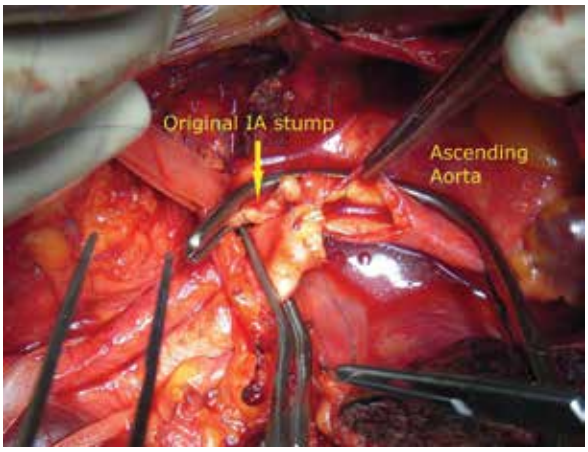

Figure 3. Implantation of the divided innominate artery at the ascending aorta proximal to its origin, which is now oversewn.

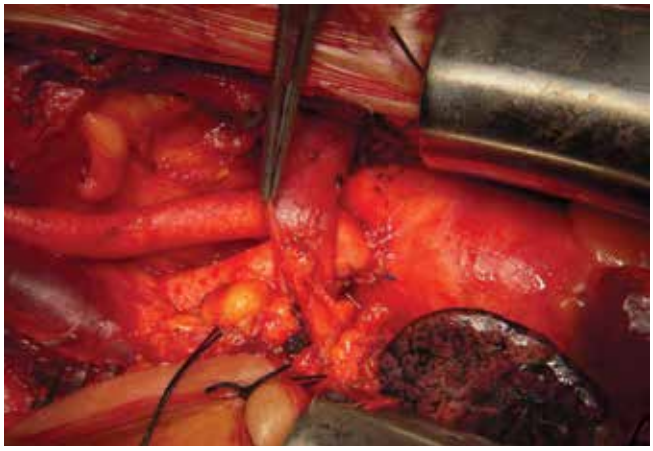

Figure 4. Final view of the implanted innominate artery (IA) after resection of the dilated part. IA, right common carotid artery (CCA), and right subclavian artery appear straight, away from the origin of the left CCA with no direct compression over the trachea.

Discussion

The case describes an uncommon entity that was reported only once in the literature, to the best of our knowledge.[1] Diseases involving IA and requiring surgical repair are relatively uncommon and consequently are rarely encountered.

Tracheal compression caused by IA pathology was published in a few reports. De Feiter et al. described an IA aneurysm compressing the trachea after thoracic aortic aneurysm repair in a patient with Marfan disease.[2] Montgomery et al. also reported tracheal compression by an IA aneurysm, but they declined to perform surgical repair as the mild symptoms did not justify the operative risk.[3] Constenla et al. and Choi et al. both reported cases of IA aneurysm with airway compression in patients with bovine aortic arch.[4, 5]

Brewster et al. published their experience with IA lesions. Among their 71 patients, 6 underwent operation for relief of tracheal compression. In five pediatric patients, this was attributed to presumed anomalous origin of IA more distally on the aortic arch. The remaining elderly patient in this group had tracheomalacia and respiratory insufficiency caused by prolonged pressure from an elongated and tortuous atherosclerotic IA similar to our patient.[1]

The method of revascularization varied in the different reports. The five pediatric patients in the Brewster et al. study underwent a pexy operation anteriorly to the sternum with relief of respiratory symptoms. The single elderly adult patient in this group required prolonged respiratory support for tracheomalacia.[1] Choi et al. resected the segment of IA with pseudoaneurysm and reconstructed with an 8-mm Dacron graft.[5] Constenla et al. placed a bypass from the ascending aorta (side-to-end anastomosis) to both common carotid arteries (end-to-end anastomoses) using a handmade bifurcated Dacron graft.[4]

None of the reported methods of relief of the airway compression was found suitable in our case. Fixation of IA to the sternum was not acceptable in view of the marked tortuosity and dilatation that would result in severe kinks. Excision of the elongated ectatic IA and reimplantation and/or replacement by a graft at the same site would have led to persistence constriction of the trachea, particularly with persistent of the adjacent left CCA origin (bovine trunk). Excising the redundancy in the CCA or subclavian arteries without changing the site of the IA origin would have led to marked angulation of either of them, causing possible symptoms later on. The only way to obtain an anatomic alignment and correct the tortuosity, remove the dilated IA segment, and eliminate the constricting effect of the bovine trunk was to disconnect the IA from its origin just distal to the CCA origin, excise the dilated segment, and reimplant proximally at the ascending aorta (Figure 4). With this reconstruction, we eliminated any fear of kinks or angles that could cause future symptoms. Replacement of the arteries by synthetic grafts was not required, and anatomic correction was achieved without the added morbidity of multiple graft anastomoses. At the 2-year follow-up, the patient had not experienced any symptoms.

Conflict of Interest Disclosure: : The author has completed and submitted the *Methodist DeBakey Cardiovascular Journal* Conflict of Interest Statement and none were reported.

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Keywords: pulsating suprasternal lump, innominate artery, trachea compression

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