RETROESOPHAGEAL RIGHT SUBCLAVIAN ARTERY

Retroesophageal right subclavian artery is the most frequent congenital aortic arch abnormality. In this anomaly, the right subclavian artery arises from aortic arch distal to the left subclavian artery and passes behind trachea and esophagus. Symptoms occur when its aneurysmatic enlargement of proximal segment (Kommerell's diverticulum) compresses esophagus and trachea or if the artery is stenosed. We present three cases with symptomatic retroesophageal right subclavian artery. A 63-year-old female patient with Kommerell's diverticulum was presented pneumonia symptoms. A 41-year-old female patient was presented arm claudication, and a 46-year-old man was presented digital ischemia on his right hand. They were treated with antibiotherapy, caroticosubclavian bypass and vasodilator treatment respectively. Symptomatic retroesophageal subclavian artery anomaly is treated. Simple and easy surgical option should be preferred if surgery is indicated.

Key Words: Aortic arch; congenital abnormalities; Kommerell's diverticulum; aneurysm; stenosis

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CASE PRESENTATION

Retroesophageal orientation of right subclavian artery is the most frequent aortic arch variation with a rate of 0,7 % in accordance with an earlier report in autopsy dissections (1). Nevertheless, the study by Backer et al. reveals that only 5 % of the cases of retroesophageal subclavian artery are symptomatic (2). Origination of subclavian artery from the aortic arch might begin in the form of a dilated segment so called Kommerell's diverticulum (3). The compression; which is caused by the diverticulum dilatation and the aneurysmatic change, is responsible for the symptomatology. In this manuscript, we report three cases of symptomatic retroesophageal subclavian artery and discuss.

Case 1: A 63 year old female patient, who presented in our clinic with severe chest pain, dyspnea, coughing, expectoration and purulent phlegm. She was hospitalized with a diagnosis of pneumonia and a mass image was seen in the right upper mediastinum in the chest roentgenogram (Figure 1).
Kommerell's diverticulum and aberrant right subclavian artery related signs were detected in computerized tomography. Aortography revealed ectasia of the assendan aorta, dorsomedial orientation of right subclavian artery distal to aortic arch

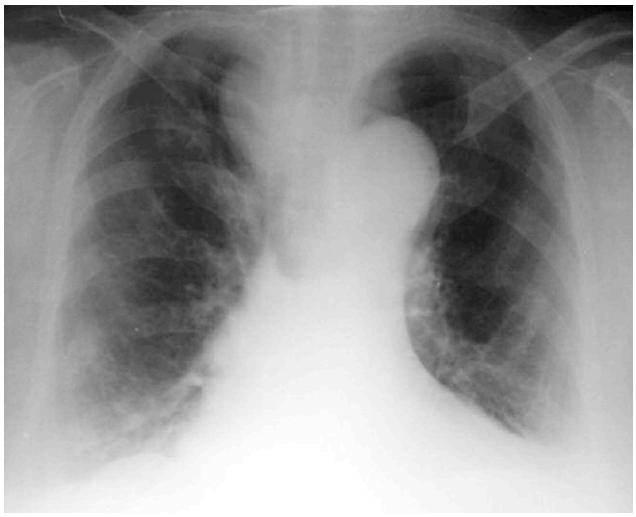

Figure-1: A frontal radiograph of the chest showing an upper mediastinal mass due to an aneurysm of the aberrant right subclavian artery and Kommerell's diverticulum.

and fusiform aneurysmatic dilatation nearly 2 cm in size in its proximal segment. Right vertebral artery originated from the right subclavian artery in a normal anatomical localization, but it was hypoplasic. The patient recovered from pneumonia, but did not accept surgical intervention.

Case 2: A 41 year old female patient, who presented in our clinic with quick tiredness and feeling cold on the right upper extremity. In physical examination, the right brachial, radial, and ulnar artery pulses were nonpalpable. Left brachial artery pressure was measured 170 mm Hg, whereas the right brachial artery pressure 60 mm Hg. Using angiography, the right subclavian artery was observed to originate from thedistal part of the aortic arch and was located dorsomedial to the left side of the left subclavian artery. The right subclavian artery was occluded at the origin of the vertebral artery. A collateral axillary artery, which developed proximal to the occluded segment and anastomosed with muscular branches, appeared weak and had a small diameter. Right brachial artery filling was observed with angiography. External pressure was suspected in a barium swallow radiograph at the level of the aortic arch along the posterior aspect of the esophagus (Figure 2).

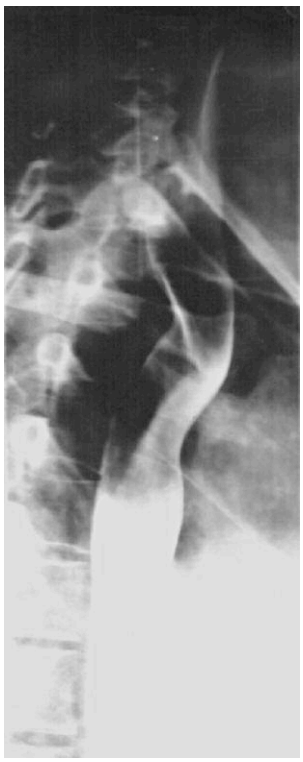

Figure-2: A lateral radiograph of the chest after a barium swallow showing anterior displacement of the esophagus due to a retroesophageal right subclavian artery.

After the patient underwent a right carotid-subclavian bypass operation using the patient's right saphenous vein, claudication disappeared in the right upper extremity. Radial and ulnar artery pulses were palpable in the postoperative period.

Case 3: A 46 year old male patient who presented in our clinic with coldness and bruise on his right, 4th finger. The pulse in the right axillary artery was not palpable at physical examination. The symptom disappeared after vasodilator treatment with the infusion of dextran and papaverin. In the MRI angiography, aberrant right subclavian artery was detected. It was originated from Kommerel's diverticulum and contained a narrow short segmental stenosis (Figure 3).

The patient did not suffer from dysphagia and upper extremity claudication. He received antiplatelet treatment (clopidogrel 75 mg/day, orally).

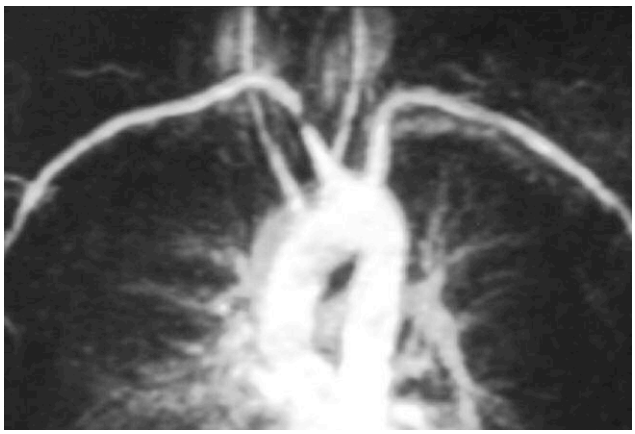

Figure-3: An MRI showing an aberrant right subclavian artery with a stenotic segment.

DISCUSSION

Aberrant right subclavian artery is a developmental anomaly which occurs when the right, fourth aortic arch fails to involute. The right subclavian artery then arises from the aortic arch distal to the origin of the left subclavian artery. It passes behind the esophagus and reaches the scalene fossa afterwhich it follows the usual path of a normal right subclavian artery (3,4). The aberrant right subclavian artery is mostly asymptomatic. The most common symptom of it is dysphagia, which is called "dysphagia lusoria". Also, diseases of the artery, which originates from atherosclerosis, trauma and inflammation as well as the diseases originating from the location of aberrant right subclavian and the existence of aneurysm, might cause symptoms (5).

Various diagnostic tools can be used in the diagnosis of an aberrant right subclavian artery. In such cases, chest radiographs reveal a mass in the posterior part of the superior mediastinum. Computerized tomography displays the Kommerel's diverticulum and aneurysm. If the Kommerel's diverticulum and aneurysm doesn't exist, only careful evaluation of the computerized tomography and MRI imaginations can determined the aberrant right subclavian artery. In an esophagography applied with barium, a filling defect on the posterior can be seen. Accurate diagnosis is possible with MR angiography of the aortic arch which provides critical information about the patient who may need to undergo surgical intervention.

There is no surgical indication for asymptomatic patients. However, patients, who are suffering from aneurysm, should be operated. The form of surgery must be chosen according to the lesion. Isolated cervical approach is usually preferred in the aberrant right subclavian cases when the patient does not have aneurysm. Retaining the proximal segment of the aberrant right subclavian artery connected with the aorta seems to be disadvantageous, but this technique is a popular option for cases in which there is no diverticulum or aneurysm (6). When there is an aneurysm, the origin of the aberrant artery from the aorta is ligated through a left thoracotomy. Caroticosubclavian transposition can be applied with a cervical approach in the same session to prevent ischemia of the right upper extremity. In cases of aneurysm, there are several treatment options such as median sternotomy approach, cardiopulmonary bypass support, and also aneurysmectomy and aorta right subclavian bypass operation with a total circulatory arrest (7,8). In patients with aberrant right subclavian artery, the surgical solution varies from simple to complicated alternatives, but the simple and easy option should be preferred.

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