

Giant Ascending Aortic Aneurysm Complicated by a Tracheal Compression: A Case Report and Review of the Literature

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Abstract

We present an uncommon case report of a giant ascending aortic aneurysm with a maximal diameter of 13.97 cm, in a previously asymptomatic and healthy 77 year old female patient, presenting with sudden dyspnea. The patient underwent an emergent surgical repair by a Bentall operation under circulatory arrest. But she died in the postoperative period with multi-organ impairment.

Keywords: Giant aneurysm; Ascending aorta; Dyspnea; Circulatory arrest; Bentall procedure

Introduction

Giant ascending aortic aneurysm, defined as an aneurysm with maximal diameter greater than 10 cm, is rare [1]. Surgical management of these aneurysms is challenging with high peri-operative mortality.

We present the case of a 77 year old woman with a 13.97 cm of diameter aneurysm of the ascending aorta.

Case Report

A 77 year old woman was admitted to the emergency department with complaints of intermittent cough, and sudden dyspnea since 5 days.

There was no past history of hypertension and cardiac symptoms. There was no significant family history.

On physical examination, the patient was dyspneic with cyanotic extremities, her room air saturation was 90%, her heart rate was 96 beats per minute, and her blood pressure was 130/90 mm Hg. Chest auscultation found a precordial murmur.

Chest X ray revealed a mediastinal widening and cardiomegaly (Figure 1).



Figure 1: Mediastinal widening and cardiomegaly in the chest radiography.

The electrocardiogram noted atrial fibrillation.

Trans-thoracic echocardiography revealed a severely dilated ascending aorta, and compressing the heart with grade 3 aortic insufficiency, and normal left ventricular function.

A thoraco-abdominal computed tomography scan was performed. It showed a huge aneurysm of the aortic root and involving the ascending aorta with the maximal diameter of 13.97 cm, intraluminal thrombus, compressing the trachea, with no visible intimal tear (Figure 2).

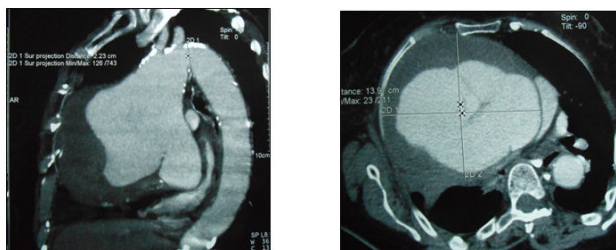


Figure 2: Thoracic CT scan showing the huge aortic aneurysm.

Biological investigations showed no abnormalities.

Because of the huge diameter of the aneurysm and the compression of the trachea, we decided to perform emergent surgical repair without doing a coronary angiography.

The patient was transferred to the intensive care unit for surgery.

Femoral arteriovenous cannulation was established to decompress the aneurysm before sternotomy and systemic cooling was started. Then, a median sternotomy was performed and the pericardium was opened. The heart was invisible, all the pericardial space was occupied by a huge aortic aneurysm (Figure 3). The arch was not involved. No intimal tear or dissection was noted.

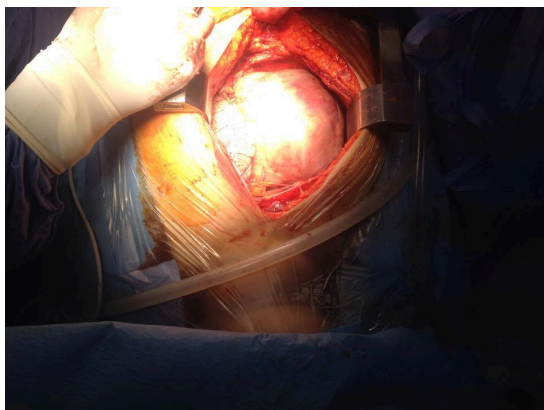


Figure 3: Intraoperative view showing the huge aneurysm of the ascending aorta.

After resection of the ascending aorta and the aortic valve, a mechanical valved prosthesis was implanted with coronary button re-implantation under cardiopulmonary bypass. The distal tubular anastomosis was performed under circulatory arrest in order to avoid the cross-aortic clamp.

Myocardial protection was performed using antegrade cardioplegie, and cerebral protection was performed by deep hypothermia at 18°C with circulatory arrest.

After rewarming, the chest was kept open due to a coagulopathy which required 08 units of blood, 8 units of fresh frozen plasma and 6 pools of platelets to obtain hemostasis.

Weaning from cardiopulmonary bypass was difficult with low cardiac output necessitating an inotropic support.

In the postoperative period, the patient had a multi-organ failure with renal oliguria, cardiac insufficiency with low ejection fraction in the echocardiography, and severe hypoxemia.

She died 4 days after the surgery.

Histopathology of the aortic tissue showed atheromatous infiltration of the aortic wall (Figure 4).

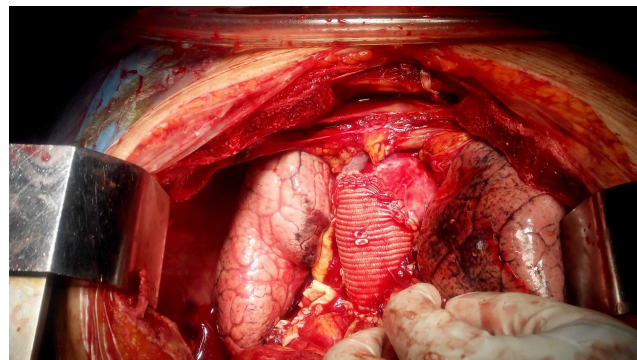


Figure 4: Intraoperative view showing the repair of the aorta with prosthesis.

Comment

Giant aneurysm of the ascending aorta, defined by an aneurysm diameter greater than 10 cm, become rare because of the improvement of diagnostic tools [2].

Our case is one of the biggest aortic arch aneurysms mentioned in the literature.

They may have a varied clinical presentation which usually results from compression of adjacent organs such as cardiac chambers, pulmonary artery, and trachea [3]. They can be revealed by pericardial tamponade [4] or chest pain and collapse [5]. They may be asymptomatic and the diagnosis is fortuitous by detection of a mediastinal enlargement or a costal osteolysis in the chest radiography [6].

Vuckovic [7] reported cases of giant aneurysms that were completely asymptomatic and presented with cyanosis.

Moutakiallah et al. [8] reported a case of an aneurysm of the ascending aorta measuring 11 cm of diameter revealed by a superior vena cava syndrome.

CT scan and echocardiography are the most common investigations to confirm the diagnosis of the aneurysm and precise its dimensions.

Apart from atherosclerosis, Marfan's syndrome and Ehlers Danlos syndrome type IV are the most prominent causes of these aneurysms. The other etiologies which need mention are giant cell arteritis, and infectious diseases [2].

The risk of rupture or dissection was found to be 31% when the diameter of the ascending aorta reaches 6 cm [9]. So, surgical repair is necessary, and it is a technical challenge.

Because the aneurysmal wall is very close to the sternum, sternotomy may result in injury to the aorta. So, femoro-femoral cardiopulmonary bypass is recommended [2].

Cerebral protection is also mandatory to avoid neurologic complications. Belov et al. [10] propose deep hypothermia of the patients and circulatory arrest. Antegrade cerebral perfusion through carotid artery and retrograde perfusion through the superior vena cava have also been reported.

Open distal anastomosis of the prosthesis to the aorta can be safely performed.

The mortality rate after surgery of these aneurysms remains high, and complications could be life-threatening especially neurological deficit and multi-organ failure [11].

Conclusion

Giant aneurysms of the ascending aorta are uncommon. Our case is one of the biggest aneurysms reported in the literature.

Their treatment is challenging and has a high mortality.

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