

A Huge Aneurism of Ascending Thoracic Aorta

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Abstract

Giant Ascending Aorta Aneurysm (AAA) is a rare condition, because of early diagnosis incidence appears to be increasing as a result of routine screening, increased clinical awareness, and improved imaging modalities. The etiology of aneurysms involving the aortic root and ascending aorta can be genetically triggered, degenerative or atherosclerotic, inflammatory, or can result from infectious diseases. According to many studies for ascending aortic aneurysms larger than 6 cm the risk of rupture, dissection, or deaths was 15.6, making it a large life-threatening aneurysm.

We present the case of a Giant AAA of about 8,7 cm diameter in a 68 years old man who was successfully operated on for ascending aorta and aortic root replacement under modified Bentall technique using composite mechanical conduit with coronary reimplantation.

Conclusion: Ascending giant aortic aneurysm is a rare finding, varying from asymptomatic clinical presentation. Surgical treatment remains the standard treatment with very good results. The selection of the operating technique is very individual, depending on the case and the experience of the surgeon.

Key words: Aorta Aneurysm. Cardiac surgery. Bentall technique.

Introduction

Giant Ascending Aorta Aneurysm (AAA) is a rare condition, because of early diagnosis incidence appears to be increasing as a result of routine screening, increased clinical awareness and improved imaging modalities. Etiology of aneurysms involving the aortic root and ascending aorta can be genetically triggered, degenerative or atherosclerotic, inflammatory, or can result from infection diseases [1, 2, 3]. According to many studies for ascending aortic aneurysms larger than 6 cm the risk of rupture, dissection, or deaths was 15.6, making it a large life threatening aneurysm [4, 5]. About technique choosing for repairing of the aortic root, using the

composite graft replacement, for patients in whom an aortic valve sparing root repair is not suitable, Modified Bentall

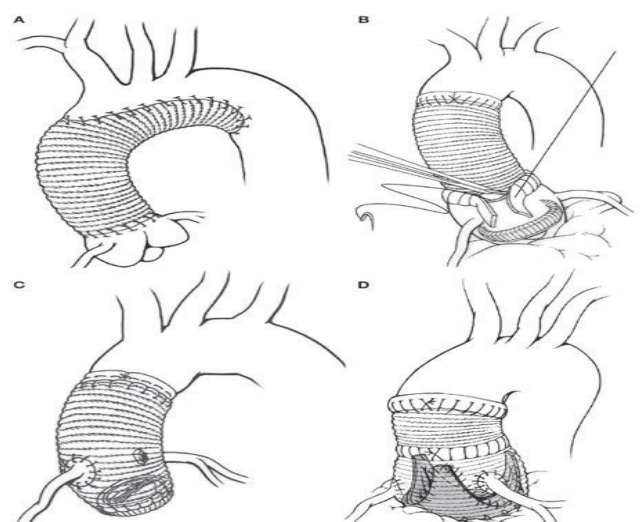


Fig 1; Surgical techniques for the treatment of the ascending aorta, and when accompanied by aortic root replacement: A - Ascending aortic and hemiarch replacement; B - Ascending aortic replacement; C - Modified Bentall procedure; D - "Valve-Sparing" according to Yako David

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technique is the technique of choice, with excellent results. In this case, the aortic valve leaflets may be normal, but there is a loss of the sinotubular junction because of the dilation of the aorta [6, 7]. This may lead to insufficient coaptation of the leaflets and therefore cause valve-regurgitation.

Preoperative assessment of patients requiring aortic root and ascending surgery generally includes a transthoracic echocardiography, and either an Angio CT-scan imaging to obtain all necessary information on the entire thoracic aorta. Proper description of the aortic dilation is necessary to optimally plan the procedure, especially the level of the distal anastomosis. In patients younger than 40 years angiography is not performed.

Case Report

S.B, 68 years-old man was admitted to our hospital because of abnormal chest computed tomography (CT) findings. With no prior medical history, only 3 months history of progressive dyspnea especially last two weeks, associated with chest discomfort. He had suffered from hypertension for many years with an irregular antihypertensive treatment and a long history of smoking. On examination, he had diastolic murmur, hemodynamically stable, other system examinations were normal, complete blood count,

biochemical and cardiac enzymes analyses were also normal. Computed Tomography CT Angiography showed a huge ascending aortic aneurism 87 x 84 mm, aortic bulb 67 mm, arch 44-35 mm, descendent part 28 mm, abdominal aorta 25 mm, with no evidence for dissection. (Fig 2)

Coronary angiography resulted with no significant stenosis. Cardiac echography; Hypertrophic LV, DTD 70 mm, EF 50%, severe regurgitation of aortic tricuspid valve, ascending aorta 87 mm, aortic bulb 67 mm, aortic annulus 28 mm, light mitral regurgitation, PSAP 25 mmHg. ECHO Doppler of carotid artery without significant stenosis. ECG RS, SV1-V3, RV4-V6

Because of root enlargement and AI not restorable, root reconstruction with aortic valved graft SJM Nr 27 with coronary reimplantation, Bentall Procedure was scheduled.

After median sternotomy a huge aorta was detected, aortic-monocaval cannulation was performed, crystalloid cardioplegia solution 800 ml as first dose and normothermic blood cardioplegia 3 X 600 ml. Aortic valve and ascendant aorta from aortic root to brachiocephalic trunk origin was excised. The patient underwent Bentall Procedure with aortic valved graft SJM nr 27 and coronary reimplantation. (fig. 3) Extracorporeal circulation time 165min, Cross clamp time 115 min. Chest tube drainage was 550 ml, extubating time was 6 hours and discharged from ICU after 40 hours.

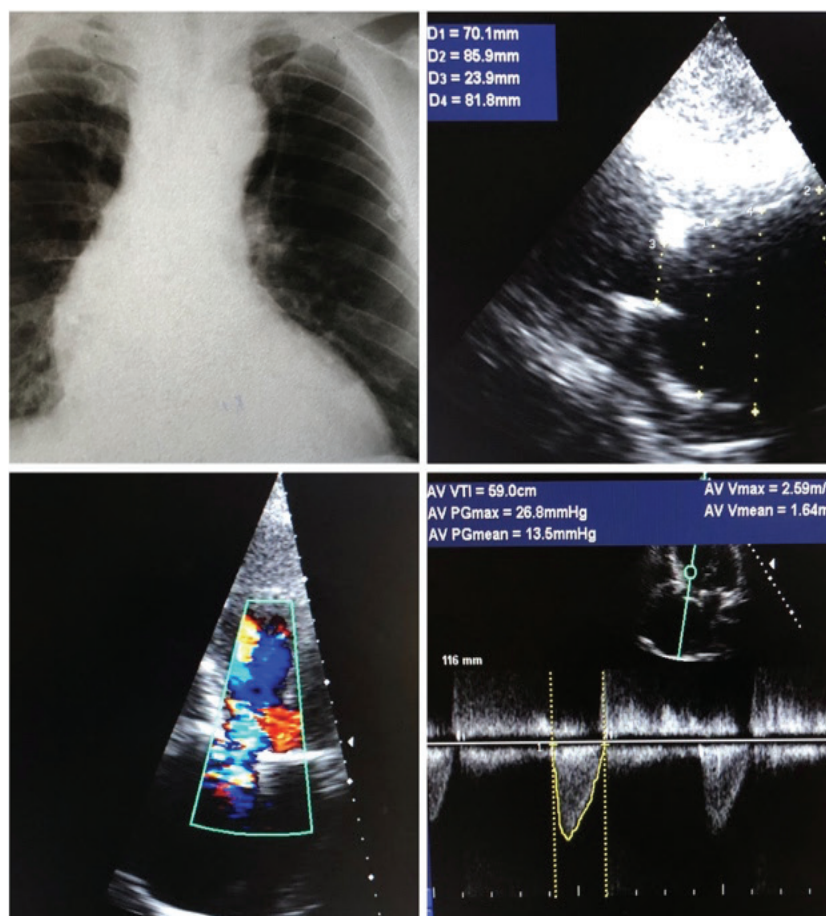


Figure 2. ECHO Doppler of carotid artery without significant stenosis. ECG RS, SV1-V3, RV4-V6

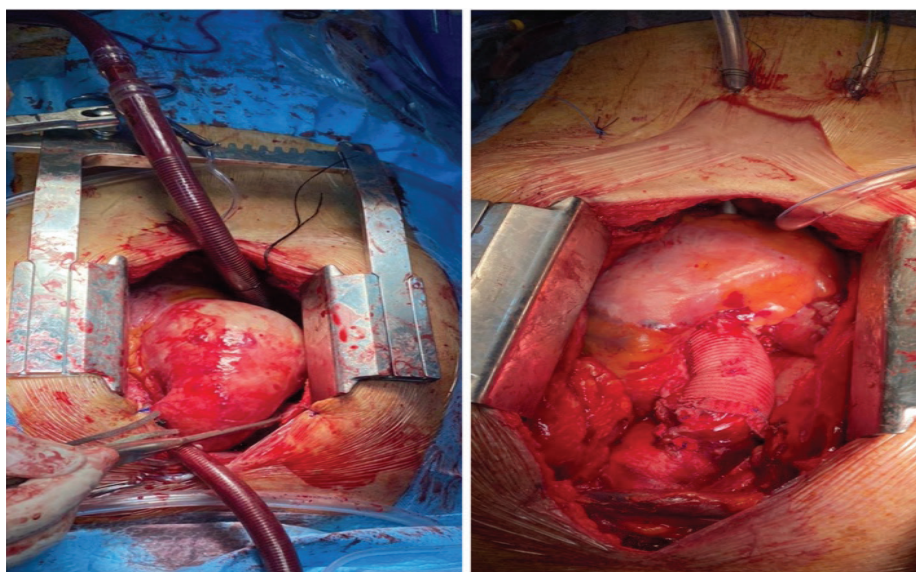


Figure 3; Intraoperative photo before and after ascending aorta, its root and valve replacement according to modified Bentall procedure

Post-operative Echocardiography resulted aortic valvular prosthesis mean gradient 10 mmHg, Gmax = 16 mmHg, Vmax = 2.0 m/s

The patient was uneventfully discharged on post-operative day 8.

Weight 96 kg, Height 180 cm

Discussion

We can find Giant aneurysms in various presentations. Major complications include dissection and rupture [8]. However, an asymptomatic giant thoracic aneurysm is extremely rare.

According to the famous Lawrence Cohn book, Cardiac surgery in the adult most TAAs occur in the ascending aorta 65 % followed by the descending thoracic aorta 35%, and the aortic arch 10 %. The average age at the time of diagnosis is around the 60–70 years range. Cystic medial necrosis is the most common pathological reason of aortic aneurysms.

In ascending aortic aneurysms and moreover giant ones, studies and dilemmas of the surgeon are related to the level of the anastomoses as these determine not only the type and success of the interventions but also the long-term results and reintervention need.

The purpose of the intervention is to replace the entire dilated aorta and perform a healthy anastomosis to reduce the risk of further dilatation or rupture in the border areas. Therefore, as we have said before, the examinations are very important to decide the strategy and the type of interventions that we will perform.

If the aortic arch is dilated, this part of the aorta must also be replaced and a complete or partial aortic arch replacement may need to be performed. To accomplish this, we implement the most contemporary technique: circulatory arrest with selective antegrade perfusion of the brain, in

moderate hypothermia (temp. 28 degrees Celsius) [9]. This technique, unlike the deep hypothermia technique, carries less risk of neurological complications and hemorrhage. In the last decade the reported results for the technique with moderate hypothermia are very encouraging, neurological events less than 2% in elective cases. However, in our case, as evidenced by the examinations performed, it is not necessary to replace the aortic arch and make circulatory arrest, which minimizes the risk of neurological events.

In the replacement of the root and the ascending aorta, very good results have been given by the valve-sparing technique of “preserving the valve” of the aorta with implantation of the coronary ostia and replacement of the ascending aorta, according to *Yacoub or David* [10, 11]. But which is preferred in elective cases, with intact aortic cusp without dilatation of the aortic root and with moderate to moderate aortic regurgitation. This technique carries the risk of interventions for aortic valve insufficiency. The degree of aortic root dilatation and valve insufficiency are important indicators of the success of the intervention and the long-term outcome.

In the planned cases the in-operator mortality is about 1.5-2.0% comparable to the cases with replacement of the isolated aortic valve [12].

Another discussion is the level of the proximal anastomosis which determines the type of intervention that we will perform. In the case of aortic and root replacement, the “modified Bentall” technique (with valved conduit) remains the “Gold Standard”. This is the procedure we performed even after the aortic root and Valsalva’s sinuses are very dilated, and the aortic valve insufficiency is advanced [7]

Lim et al. in his study of 120 cases where both techniques were used, *Bentall and David*, with a 5-year follow-up [13]. There was no significant change in mortality

88.4 ± 5.2% in the Bentall group and 90.8 ± 4.4% in the “valve-sparing” group. Moreover, there was a higher incidence of re-interventions in cases of “valve-sparing” as a result of the recurrence of severe aortic insufficiency. The authors recommend caution in decision-making in cases of severe aortic valve regurgitation.

On the contrary *Dias et al.* reports significantly more complications associated with mechanical prosthesis in the Bentall technique than in that with aortic valve preservation “David procedure” and with a difference in mortality in 7-year follow-up [14].

However, the introduction of the Bentall technique with conduit grafts with biological valve has minimized the risk of hemorrhage in patients over 65 years of age.

Conclusion

Ascending giant aortic aneurysm is a rare finding, with varying from asymptomatic clinical presentation. Surgical treatment remains the standard treatment with very good results. The selection of the operating technique is very individual, depending on the case and the experience of the surgeon.

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