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Title: “A 12.8 CM DIAMETER: GIANT AORTIC ANEURYSM (GAA) SUCCESSFULLY TREATED BY BENTALL’S PROCEDURE- Case Report ”

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BACKGROUND

Aneurysm is the second most frequent disease of the aorta after atherosclerosis.¹ The dilatation of sinuses of valsalva involving together sinotubular junction, and proximal ascending aorta is referred as Aortic root aneurysm.² Being one of the rare complications after aortic valve replacement surgery; the aneurysm of size > 5 cm needs surgical intervention like Bentall's procedure.³

The aneurysm in the aorta exceeding 10 cm in its maximum diameter is uncommon clinical entity associated with the risk of rupture.⁴ The rupture risk is directly proportional to the size of the aneurysm. The annual rate of rupture for aneurysms reported in literature database is 14% for GAA greater than 6 cm diameter.⁵ Among various enlisted etiologies atherosclerosis is one of the most common causes of aortic aneurysm and other causes include Marfan's syndrome, giant cell arteritis, tuberculosis, syphilis, HIV-associated vasculitis, hereditary hemorrhagic telangiectasia, and medial agenesis.^{6,7}

We herein report a case of GAA measured 12.8cm cm in its maximum diameter which was successfully treated by Bentall's procedure.

CASE REPORT

A 40 year old male presented with complaints of breathlessness on exertion from two months, x ray, (Figure 1) echocardiography and contrast-enhanced computed tomography (CECT) (Figure 2) revealed giant ascending aortic aneurysm about 12.8 cm in diameter with minimal intimal flap suggestive of dissection. Prosthetic valve function and other cardiac structures were

assessed as normal. The clinical and radiological findings concluded to diagnosis of severe aortic regurgitation and moderate aortic stenosis.

The medical history was elicited for aortic valve replacement with a mechanical prosthetic valve of size 25mm, 13 years ago. In first operation the ascending aorta was mildly dilated and measured 3.5cm in size as per old clinical records of patient.

Elective surgery was planned as interventional treatment regimen. Cardiopulmonary bypass (CPB) established via right axillary artery and right femoral vein aided in maintaining the circulation of blood and the oxygen content of the patient's body. Bentall's procedure was done using 27 mm Dacron composite graft (Figure 3). Patient required permanent pacemaker for complete heart block in post-operative period. Thereafter patient was discharged in stable condition.

DISCUSSION

Giant aneurysms can have various presentations and is rare clinical entity. The complications leading to poor prognosis include dissection and rupture.⁸ Leaking aneurysms also present with typical features of acute dissection with pericardial tamponade with chest pain and collapse.^{9,10} The risk of rupture being directly proportional to the size is also comparable to the rate of growth of the aneurysm.¹¹ To the best of our knowledge only some case reports in the literature of unruptured giant aortic aneurysm are reported. Life expectancy without surgical intervention for cases of giant aneurysm is very low.¹² The current guidelines recommend surgical intervention in cases with the diameter of the aneurysm exceeding 5.5 cm and 4.5 cm in case of Marfan syndrome.¹³ It is not uncommon that these patients die from either the rupture of aneurysm or decompensating organs and systems.¹⁴ Indeed, the 10-year risk of mortality may be as high as 15 times the risk of aorta-related death in patients with abdominal aortic aneurysm (AAA) in comparison to any other cardiovascular cause (e.g. myocardial infarction or stroke).¹⁵

The recommended guidelines as per American Heart association, suggests interventional treatment regimen even if there would not have been any dissection of adjacent organs to prevent complications associated to GAA.^{16,17} In present case dissection was associated with the sinuses of valsalva involving together sinotubular junction, and proximal ascending aorta; sparing operation was not possible. Hence, Bentall procedure was performed using 27 mm Dacron

composite graft. The Dacron composite graft remains conduit with excellent hemostatic and hemodynamic properties & with the increasing age of patients who undergo aortic root surgery, a biological aortic valve as a composite biological valved conduit is gaining acceptance.^{18,19}

The Bentall procedure has an operative mortality no worse than that for aortic valve replacement as per literature data base, with superior long-term survival rate.²⁰ In Bentall technique direct reimplantation of the coronary arteries is accomplished, whereas the modified techniques now also advocated by certain authors require formation of ostial “buttons” that are then attached to the graft.²¹ Despite significant improvements with modified techniques, intra-operative blood loss and post-operative complications remain a major obstacle.²²

CONCLUSION: Aortic aneurysm need interventional treatment regimen to decrease the associated morbidity and mortality. Regular follow up of such patients is necessary to trace ascending aortic reoperation if choice is Bentall procedure.

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