

Isolated Ascending Aortic Aneurysm Treated by Linear Plication and External Wrapping Via Upper-J-Sternotomy Under Off Pump Technique

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Abstract

Ascending aortic aneurysm is an aortic dilatation of more than one and half of normal diameter carrying a high risk of dissection and rupture [1]. Since long time, ascending aortic aneurysms have been treated mainly by graft replacement. In our clinic we used to plicate the aneurysmatic segment firstly then do wrapping by dacron graft in patients who are proper for such technique [2]. In general, all the procedures in managing ascending aortic aneurysms are done with CPB (on pump) with complete sternotomy. In this case, the isolated aortic aneurysm was managed by linear plication and external wrapping of a dacron graft, the operation was carried out under off pump and via upper-Jsternotomy.

Keywords: Ascending Aortic Aneurysm; Linear Plication; External Wrapping; Laplace's Law; Off Pump; Upper-J Sternotomy

Introduction

Ascending aortic aneurysm is an aortic dilatation of more than one and half of normal diameter carrying a high risk of dissection and rupture [1].

Case Presentation

A 37 year old male patient, presented with chief complaint of chest pain from time to time radiating to the back. He was on medication for uncontrolled essential hypertension. His father died from acute aortic dissection. Coronary angiography showed no coronary artery disease but there is a dilation in ascending aorta. Echocardiography showed minimal aortic insufficiency, while chest CTscan showed ascending aortic aneurysm of about 52 mm (Figure 1).

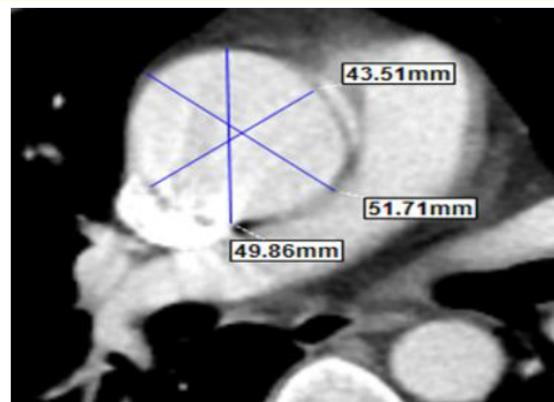


Figure 1: Chest CT-Scan showed dilated ascending aorta.

His case was discussed in details with him and the decision was taken to operate. Patient was operated under general anesthesia, via upper-J-sternotomy and off pump. Ascending aorta was released from the nearby connecting tissues by using bipolar cautery then the aneurysmatic segment was firstly plicated over a straight vascular clamp by 4.0 Polypropylene then wrapped by using a 32 mm dacron graft, after had been cut longitudinally and given a butterfly shape (Figure 2). The outer boardsers of the dacron graft were sewed to each other in an order of over and over fashion by 2.0 coated braided polyester (Ticron) (Figure 3).

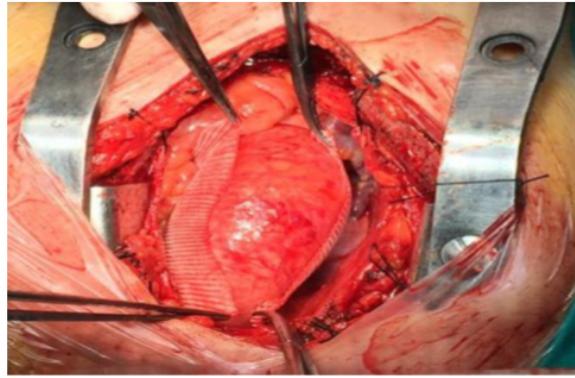


Figure 2: Dacron graft preparation for wrapping.

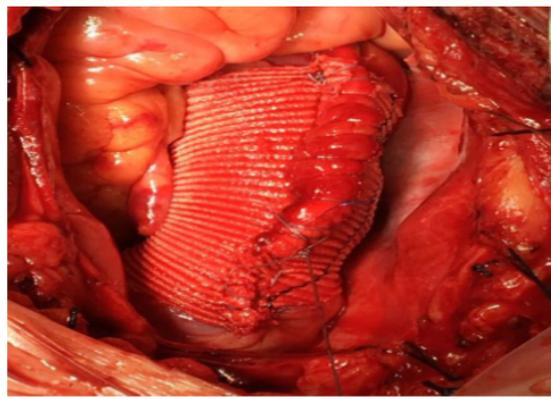


Figure 3: After plication and wrapping.

Postoperatively the patient was taken to our intensive care unit where he awakened after about one hour and extubated after two hours, he was transferred to the floor on the next day with no complaints or any any complication. In this operation we had not used cross clamp, there was no need for CPB, the sternotomy was done as an upper J-sternotomy shape, that patient had only minimal to mild chest wall pain postoperatively which was managed by simple pain killers. There was no need for blood transfusion. Also, there were no electrolyte

disturbances or any renal or pulmonary problems. After three days he was discharged in good health without any complaint. During control visit, control CT-Scan was done and showed an obvious reduction in ascending aortic diameter with no pericardial effusion or any other pathology.

Discussion

Aortic aneurysms are one of the most fatal pathologies of the aorta, if dissection or rupture occurs. About 50% of the patients with dissected ascending aorta die within 48 hours while 15 - 26% of whom undergo urgent surgery die too [3,4]. Early diagnosis and management are the first step of treatment. For long time ago, standart aneurysmatic segment replacement had been the standart method of managing such cases [5]. Even this type of surgical treatment is well established, it has alot of complications and associated with high rate of blood loss and transfusion, many other surgical teqniques had been tried in different times but also each one of them has its advantages and disadvantages. For example, Robicsek had done reduction aortoplasty with external wrapping of the fusiform aneurysmatic ascending aorta in 1982, he excied an oval segment of the aneurysm then wrapped the segment [6].

In our center we have a good experience in managing ascendin aortic aneurysms in proper patients with linear plication of the aneurysmatic segment and wrapping the reduced segment by dacron graft without any excision or opening the aneurysm [2]. As it's known that the reduction of the aneurysmatic segment can eliminate the aneurysm itself but can not prevent its possible recurrence, so we need an external wrapping to prevent such possibility, on the other hand external wrapping supports the reduced aortic wall from possible erosion and degeneration in the future. Thus, the combination of plication and wrapping techniques can reduce the share stress according to Laplace's law and strengthen the aortic wall [2,7].

This case was different because the operation was carried out without CPB machine and the sternotomy was done minimally by doing just upper J- sternotomy. The patient awaked after one hour in intensive care unite and extubated at the second hour postoperatively, there was no need for blood transfusion and the blood lab testes were in normal ranges, he had only mild to moderete chest wall pain that released by simple pain killers. After on day he was transferred to the floor then discharged on the third day of the operation on medical treatment. Later on, on his control visites as an outpatient, control chest CT-Scan was done and showed no pericardial effusion and the diameter of the reduced ascending aorta was in acceptable range.

We had a study done before in our clinic in management ascending aortic aneurysms by linear plication and external wrapping among the period of March 2009 to May 2011 for selected elderly patients who had ascending aortic aneurysms associated with comorbidites such as chronic renal failure, chronic obstructive pulmonary disease and whose coronaries and valves had not required surgical management. Patients with Marfan syndrome or any other connective tissue disorders were excluded from that study [2].

This case was slightly different, that the patient was young and it was done without CPB, there was no cross clamp and the sternotomy was done in upper J-sternotomy fashion.

Conclusion

According to Laplace's law and our experience, we believe that the isolated ascending aortic aneurysm management in selected patients can be done by linear plication and external wrapping technique with no need for CPB and with small sternotomy as upper J-sternotomy.

The result was satisfied for us but there is a need to more experience and long follow up time in this management to be able to stress the usage of this technique.

Patients Inform Consent

Inform consent had been written and signed by the patient himself accepting his case to be our case report and publishing the pictures of his CT-Scan and operation.

Declaration of Conflicting Interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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