

Single stage surgical approach for arch and descending thoracic aorta aneurysm

Tratamento do aneurisma de arco e aorta descendente: abordagem cirúrgica em uma etapa

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Abstract

We report on a 61-years-old male patient, who had an extensive arch and descending thoracic aorta aneurysm diagnosed while treating a pulmonary infection. The objective of this work is to report an unusual single stage surgical approach to correct an extensive arch and descending thoracic aorta aneurysm.

Descriptors: Aorta, surgery. Aortic aneurysm, thoracic, surgery.

Resumo

Paciente de 61 anos procurou atendimento médico com quadro clínico de infecção pulmonar. O estudo radiológico de tórax revelou aneurisma de aorta descendente com comprometimento do arco aórtico. Ressalta-se a correção cirúrgica em uma única etapa, por meio de abordagem operatória não convencional, que possibilitou a correção total do aneurisma.

Descritores: Aorta, cirurgia. Aneurisma da aorta torácica, cirurgia.

Work performed in the Instituto do Coração (InCor) – HC-FMUSP

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INTRODUCTION

Aneurisms of the descending thoracic aorta are the most common cause of thoracic aorta disease that requires surgery intervention. The principal etiology is atherosclerotic disease but it can also be secondary to blunt thoracic trauma, infection or connective tissue diseases [1]. It develops at a mean annual rate of about 0.10 cm/year [2] and due to its silent evolution it can present additional operative risks, as frequently the diagnosis is made when the disease is already at an advanced stage or secondarily to complications, such as rupture or dissection.

The objective of this report is to present the operative conduct with an unique approach to correct a large aneurism located in the aortic arch and in the descending aorta, where the traditional approach by sternotomy or left thoracotomy, would not allow treatment of the aneurysm in a single surgical stage.

CASE REPORT

A 61-year-old male mulatto patient, who was an ex-smoker, looked for medical assistance with fever, simple dyspnea and atypical thoracic pain. The physical test was unspecific, however, a simple chest radiological study identified accentuated enlargement of the mediastinum. A helicoidal tomography of the thoracic aorta diagnosed an aneurism justifying surgery intervention.

SURGICAL PROCEDURE

An anterolateral bi-thoracotomy in the 4th intercostal space was performed with the patient in the dorsal decubitus position slightly inclined to the right, enabling access to all the mediastinum and to the aortic arch, up to the distal third of the descending aorta (Figure 1A).

The establishment of cardiopulmonary bypass was achieved by right subclavian artery and the venous drainage was by a single cannula in the right atrium. Cerebral protection during the period of total circulatory arrest, was obtained by profound hypothermia (18°C) associated with topical cooling of the head with ice and selective antegrade perfusion through the right carotid artery. Thus, it was possible to place a Dacron tube from the ascending aorta to the distal portion of the descending aorta, with the re-implantation of the great vessels in the tube (Figures 1B and C).

In the postoperative period, initially the patient had difficulties on attempting to remove the mechanical respiratory assistance due to ventilatory disturbances, secondary to left phrenic paralysis, caused by an iatrogenic lesion due to the extensive involvement of the dilatation. The patient was successfully extubated on the 5th

postoperative day and was released from hospital on the 15th postoperative day.



Fig. 1 - A – Intra-operative aspect of the bi-thoracotomy surgery incision; B- Intra-operative photography of the final aspect of surgical substitution of descending aorta, aortic arch and part of ascending aorta with the re-implantation of great vases; C - Size of the intraluminal thrombus involved in the aneurism

A chest helicoidal tomography in the late follow-up showed a complete correction of the underlying disease (Figure 2B) that had been identified in the initial radiography (Figure 2A).

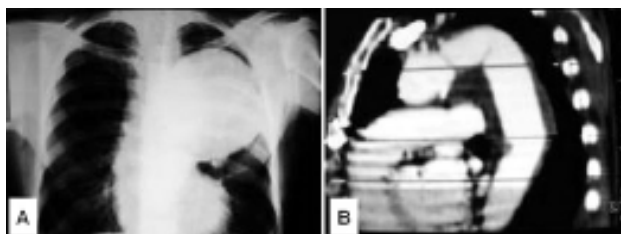


Fig. 2 - A- Chest radiography taken in the preoperative period that shows a large growth in the medial and upper mediastinum, invading the left hemithorax. B- Helicoidal tomography of the thoracic aorta, demonstrating the final aspect of reconstructed thoracic aorta

COMMENTS

Aneurisms of descending aorta, because of their anatomic localization in the thorax, tend to evolve asymptotically and when present, the symptoms are related to rupture, dissection or the involvement of adjacent structures. Patients can present dysphonia – when there is involvement of the recurrent laryngeal nerve, respiratory insufficiency, hemoptoic episodes or hemoptysis secondary to the pulmonary involvement and dysphagia or hematemesis with esophageal involvement. Their incidence is 10 cases in every 100.000 inhabitants/year [1] with a tendency to increase due to the increase in the life expectancy in the Brazilian population.

The slow evolution permits growth to a large size, without diagnosis. The recommended surgery will depend on the symptoms and on the cross-sectional diameter of the aorta and/or on its growth when asymptomatic [2].

The operative technique to approach the aorta through

anterolateral bi-thoracotomy with transverse sternotomy was recently presented by KOUCHOUKOS et al. [3] in patients submitted to reoperation for the correction of the Stanford type A aortic dissection. According to the authors, the technique gives a best access of the dilated segment of aortic arch, descending aorta and great vessels.

When the aneurism does not compromise the aortic arch, large aneurisms can be approached using left thoracotomy or thoracophrenolaparotomy, with similar techniques of protection against spinal cord and cerebral ischemic lesions [4-6].

CONCLUSION

The antero-lateral bi-thoracotomy by transverse sternotomy provides an option of surgery intervention in a single stage, amplifying the access to the thoracic aorta and allowing total correction of the disease with great speed and thus is a decisive factor in the good evolution of these patients.

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