Archives of Cardiology and Cardiovascular Diseases

ISSN: 2638-4744

Volume 1, Issue 2, 2018, PP: 28-31

One Stage Surgical Treatment of Debakey Type I Aortic Dissection, using a Hybrid Stent-Graft E-Vita Open

Joao de Deus e Brito[1]*, Claudio Roberto Assumpcao[2], Gerez F Martins[3], Eduardo Simas[4] Roberto Young Jr[4], Mauricio Lobo Nascimento[4], Lucas Moura Bezz Maciel[4], Luisa de Campos Guimaraes[4]

[1]*MsC, PhD by UFRJ-Brazil and invite Professor of the Institute of Cardiology.

[2]Head of service , cardiovascular surgery of the State Institute of Cardiology Aloysio de Castro-RJ-Brazil.

[3]MsC, PhD , Head of service , Cardiovascular Intensive Care Unity of The Institute of Cardiology Aloysio de Castro-RJ-Brazil, [4]Staff Physician.

jdeus313@gmail.com

***Corresponding Author:** Prof. Joao de Deus e Britto, MsC, PhD,UFRJ-Brazil and invite Professor of the Institute of Cardiology, Brazil.*

Abstract

Acute aortic dissection is a lethal condition, with an average thirty-day mortality rate of 48% with clinical approach and 26% if surgical intervention is performed early. We present a case of a 48 –year-male suffering type A acute aorta dissection, second rupture point after left subclávia and large aneurysm of descending aorta without aortic valve regurgitation. The patient was submitted to surgical treatment with extracorporeal circulation and a hybrid prosthesis composed of a polyester segment for the replacement of the ascending aorta and arch, together with an auto expanding distal end graft positioned inside the true lumen of the descending thoracic aorta. A two and a half year follow up.

Keywords: *Surgery, one stage treatment, dissecting aorta. E-vita Open, hybrid stent-graft, aortic arch, descending aorta. Thoracic aorta.*

Introduction

Currently the best practices to surgical treatment for type A dissection involve ascending aortic replacement, open distal anastomosis of the hemiarch under circulatory arrest with a varying degree of hypothermia and anterograde cerebral perfusion [3].

Despite using this approach, a residual dissecting flap may persists in the arch and in the descending thoracic aorta. Patients with occluded false lumen ten year survival rate is about 89%, decreasing to 59% with present false lumen [4]. Even if the advancement of cardiac surgery techniques, employment of modern cerebral protection strategies, myocardial protection and aortic graft development, the surgical mortality of these operations, even in centers with specific interest in aortic surgery used to be in the range of 25% [1]. In the last ten years several strategies have been employed by cardiac surgery community in order to decrease the high mortality and risks of this surgery [5].

The Frozen Elephant Trunk (FET) technique allows surgical access to the descending thoracic aorta via sternotomy and has been used for the treatment of acute and chronic aorta dissections, beside having contributed to the development of new hybrid procedures [5,6].

Those procedures of a conventional arch replacement with a downstream placement of a novel graft through the open arch has stimulated the development of a new hybrid graft, E-vita Open Plus, which is composed of a polyester segment for the replacement of the ascending aorta and arch, together with an expanded segment positioned in the descendig thoracic aorta. This device was designed and introduced by Tsagakis et al. in 2005 to avoid the two stage surgical approach in surgical treatment of complex thoracic aortic diseases.

They presented a cumulative experience over the past 8 years with an average hospital mortality rate of 13%, 17/132 patients [7]. By using this hybrid procedure, Dias et al. recently presented their initial experience with 21 patients with a hospital mortality rate of 14.2%, being 50% in acute type A aortic dissection, 8.3% in chronic type A aortic dissection. False lumen thrombosis was obtained at 80% [9].

This study aims at describing our first experience with the hybrid stent graft system,E-vita Open Plus using extracorporeal circulation, in one stage, to surgical treatment of extensive chronic dissection,involving ascending aorta, aortic arch and descending aorta.

Case Report

A 48 year old male was addmited to the emergency unit with sudden anterior chest pains with a migrational character and sudden hoarseness, 3 hours after falling down 3m the roof of his house while working.On physical examination he presented conscious, hemodynamic stability, with no signs of aortic valve regurgitation, or peripheral or vascular cerebral ischemia. A thoracic aorta angiotomography using iodized contrast showed chronic De Bakey Type I dissection (Figure 1), with indication of surgical treatment.

Figure 1. *Angiotomography of the aorta Type A: preoperative showing great false lumen in the descending aorta*

Surgery

Transesternal median thoracotomy was perfomed and the opening of the pericardium demonstrated a huge ascending aorta and dilation arch. Cardiopulmonary by-pass (CPB) was employed with double vena cava, venting of left ventricle through the right superior pulmonary vena, and arterial line insertion of a tube placed inside the right subclávia artery sustained by a longitudinal pursing 5-0 prolypropylene without a Dacron tube.Meanwhile the sistemic temperature decreased to 23ºC the ascending aorta was occluded and opened in the lower third. There were no evidence of tearing or dissection that point.The aortic valve was competent with three regular leaflets. The myocardial proctetion was done with blood intermitent anterograde cardioplegia straight to coronary ostias. And brain protection with a selective perfusion with low flow of 100ml /kg. Under circulatory arrest the distal arch was opened through a transversal incision. Showing laceration point and inicial dissection 2 cm under the brachiocephalic trunk. There was a new tearing under left subclávia artery and a false aneurysm .The autoexpanding stent graft E-vita Open plus (Jotec GmbH, Hechingen, Germany), which was 150x30 mm in length, (Figure 2) was introduced into the true lumen of the descending thoracic aorta and fixed to the proximal using a continuous 3-0 polypropylene suture. The vessels of arch were sutured en bloc, in the polyester segment of the hybrid prosthesis, followed by suture of the ascending aorta. The post-operative period was without complications and the patient was discharged after 15 days.

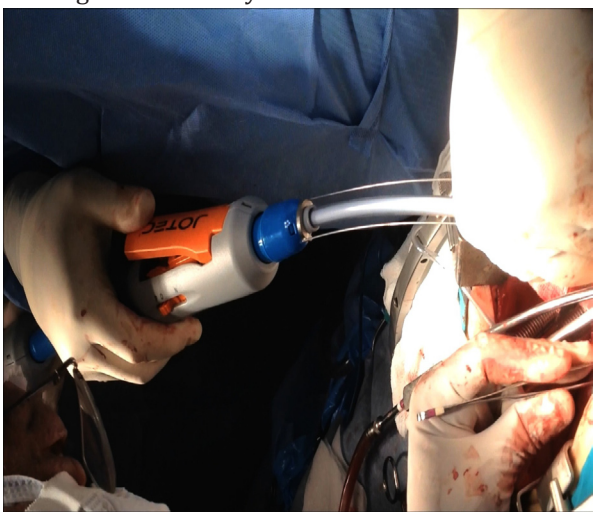

Figure 2. *Expanded hybrid prosthesis, to be introduced inside of true lumen of the descending aorta.*

Follow Up

After a post operative period of two and a half years, the patient was re-admitted to our Hospital with thoracic pain, mild dyspnea, presenting hemodynamic stabilization. Thoracic X ray showed left pleural effusion which was drained of 1.500 ml of bloody fluid. There was lung expansion after pulmonary decortication. Angiothomography with iodizesd enhancement showed: ascending aorta, reimplanted arch and descending aorta resconstruction (Figure 3A & 3B). There was a very distal ulcer of the descending thoracic aort (Figure 4) that was covered with an implant of the stent (Valiant Captive Medtronic), which was 32mm x 150mm through the left femoral artery. The patient was discharged asymptomatically with a recovered voice five days after the peripheral procedure.

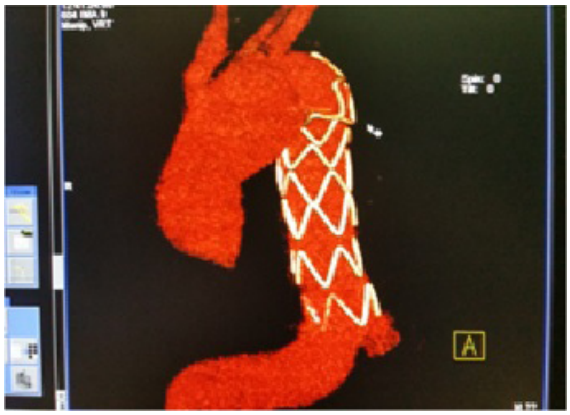

Figure 3A. *Angiotomography of toracoabdominal Aorta under digital subtraction with evidence of ascending aorta, reimplanted arch and descending aorta completely rebuilding: two and a half year postoperative.*

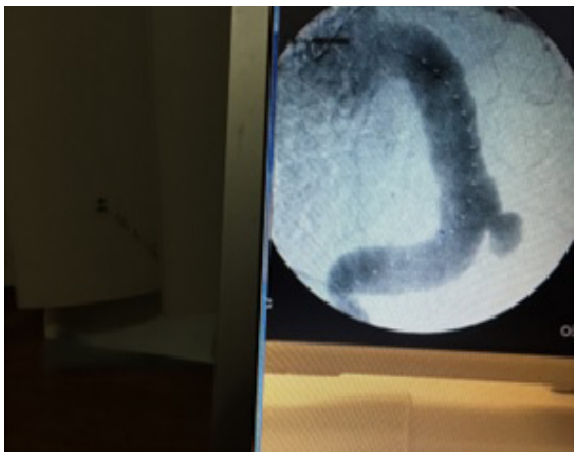

Figure 3B. *Distal thoracoabdominal aorta showing ulcer the end of implanted stent.*

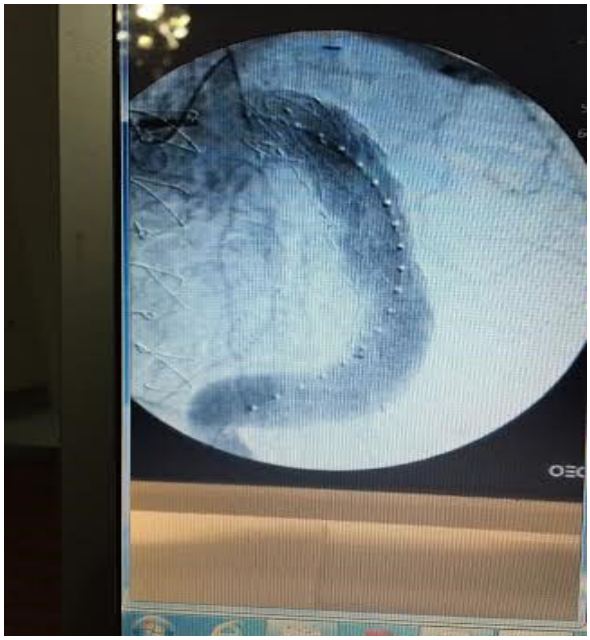

Figure 4. *Thoracic aorta angiography post operative showing image of the descending operated aorta characterized by absence of residual Ulcer which was covered by Valiant stent.*

Discussion

One stage repair of complex aortic dissections of the ascending , arch and descending aorta by means of this hybrid prosthesis and extracorporeal circulation has been currently making it possible to access the descending aorta, after the left subclávia artery[5]. The possible complications that may run present so easy resolutions as was related in this case.Those procedures are also indicated as follows:type I chronicle aorta dissections showing aneurysmatic descending aorta ≥ 6cm; type III with retrograde dissections; aneurysmatic complex diseases of the thoracic aorta. The dimension of surgery could be sucessfully reduced by shortening ischemia time and postoperative complications [5,7]. Up to the present time there are cumulative experiences in 10 Europian centers over the past 8 years with expressive figures of 416 operated patients using this new surgical option as related at the Essen International E-vita open hybrid stent graft system registry,and the International E-vita open registry (IEOR). The development of endovascular techniques and a such hybrid procedures have been allowed surgeons to reduce the rate mortality and risk associated with surgery of dissections and complex aortic diseases [7,8,9].

Conclusion

One stage repair of extensive Type 1 De Backey could be archieved successfully by using the E-vita open hybrid stent graft system. Two year and a half of being asymtomatic, a reintervention was necessary to cover a distal ulcer of the thoracic descending aorta with the implant of a stent introduced through the left femoral artery as was described in the follow up section

References

[1] Hagan PG, Nienaber CA, Isselbacher EM, Bruchnan D, Karavite DJ, Russman PL et al.The International Registry of Acute Aortic dissection (IRAD) News insights into the old disease. JAMA 2000;283:897-903. (PUB MED)

[2] Jakob H, Tsagakis K. International E-vita open Registry. Ann Cardiothorax Surg 2013;2(3):296-299.

[3] Dias RR, Silva IA, Fiorelli AI, Stolf NAG. Proteção cerebral: sítios de canulação arterial e vias de perfusão do cérebro. Rev Bras Cir Cardiovasc. 2007; 22 (2):235-40.

[4] Song SW, Chang BC, Cho BK, Yi G, Youn YN, Lee S, et al. Effectts of partial thrombosis on distal aorta after repair of acute DeBakey tipe I aortic dissection. J Thorac Cardiovasc Surg.2010; 13 (4) :841-7.

[5] Appoo JJ, Pozeg Z. Strategies in the surgical treatment of Type A aortic arch dissection.Ann Cardiothorac Surg 2013;2(2):205

[6] Borst HG, Heinemann MK, Stone CD. Surgical treatment of aortic dissections. New York: Churchill Livingstone, 1996, p.357.

[7] Tasagakis K, Dohle D, Benedik J, Lieder H, Jacob H, Mohr F et al. Over all Essen's experience with the E-vita open hybrid stent graft system and evolutions of surgical techniques. Ann cardiothorac Surg 2013 Mar; 2(5):612-620.

[8] Dias RR, Duncan JA, Vianna DS, Faria LB, Fernandes F, Ramires FJA et al. Surgical treatment of complex aneurysms and thoracic aortic dissections with the Frozen Elephant Trunk tecnique. Braz J Cardiovasc Surg 2015;30(2):205-1

Citation: **Joao de Deus e Brito, Claudio Roberto Assumpcao, Gerez F Martins, Eduardo Simas, Roberto Young Jr, Mauricio Lobo Nascimento, Lucas Moura Bezz Maciel, Luisa de Campos Guimaraes**. *One Stage Surgical Treatment of Debakey Type I Aortic Dissection, using a Hybrid Stent-Graft E-Vita Open. Archives of Cardiology and Cardiovascular Diseases. 2018; 1(2): 28-31.*