CASE REPORT

Aortic dissection Stanford B and DeBakey IIIB treated by hybrid surgical approach. A case report

Mariana Aguirre-Varas de Valdez, Juan M. Tarelo-Saucedo, Erik E. Ortega-Romo, Guadalupe D. Rodríguez-Aquino, Jesús A. Morales-Hernández, and Jorge Meza-Carmona.

Department of Cardiothoracic Surgery, Hospital Central Sur de Alta Especialidad, Pemex. México City, MÉXICO.

Aortic dissection is a disease of the tunica media of the vessel in which a false lumen is created through which blood flows between the media and intimal layers. The diagnosis is complex, and imaging studies are indispensable during the approach. Acute chest or abdominal pain radiating to the back is the main symptom. In patients with complicated type B aortic dissection, surgical treatment is imminent. We present here a case of a 55-year-old male with Stanford B and DeBakey IIIB aortic dissection underwent hybrid procedure successfully.

***Key words:** Aorta; Aortic dissection; Surgery.*

La disección aórtica es una enfermedad de la túnica media del vaso en la que se crea una luz falsa por donde hay afluencia sanguínea entre las capas media e íntima. El diagnóstico es complejo, siendo los estudios de imagen indispensables durante el abordaje. El dolor torácico o abdominal agudo irradiado a la espalda es el principal síntoma. En los pacientes con disección aórtica tipo B complicada el tratamiento quirúrgico es inminente. Presentamos un caso de un paciente masculino de 55 años de edad con diagnóstico de disección aórtica tipo Stanford B y DeBakey IIIB aortic dissection, el cual fue sometido a un procedimiento híbrido exitosamente.

***Palabras clave**: Aorta; Disección aórtica; Cirugía.*

Cir Card Mex 2023; 8(4): 114-116.

Aortic dissection can be defined as a delamination of the medial layer caused by the inflow of blood through an entry orifice in the intima layer creating a false lumen of variable extension along the vessel [1]. It is more frequent in men than in women with a 2:1 ratio respectively, and more common between 50 and 70 years of age [2]. The most frequent causes are long-standing systemic arterial hypertension, connective tissue diseases and trauma [3]. Its presentation can be hyper acute (first 24 hours), acute (up to 14 days after onset), subacute (15-90 days after onset) and chronic (>90 days after onset) [4].

The most commonly used classification systems are DeBakey and Stanford [5]. DeBakey classification divides the disease into 3 groups according to the site where the dissection starts. Type 1 starts in the ascending aorta with extension to the descending aorta, Type 2 starts in the ascending aorta without extension to the aortic arch, and Type 3 starts in the descending aorta; in turn, 3A with extension above the diaphragm, and 3B below the diaphragm [5]. Stanford classifies it into 2 types; namely, type A includes dissection of the ascending aorta, and type B does not include the ascending aorta [5].

Corresponding author: Dra. Mariana Aguirre Varas de Valdez
email: marianavarasdevaldez@hotmail.com

The most common symptom is spontaneous onset of severe chest and/or low back pain. Patients with type A dissection usually have pain in the anterior thorax, and patients with type B dissection report lumbar pain [5]. During diagnosis, complementary examinations are important to assess the diagnosis and determine the extent. The most important examinations are computed tomography angiography (CT angiography), magnetic resonance imaging (MRI) and transesophageal echocardiography [3].

The reported frequency for primary dissection of the abdominal aorta is less than 2%, compared to the ascending aorta (70%), descending aorta (20%) and aortic arch (7%) [6].

Acute Stanford A dissection carries a mortality of about 1% per hour. Although less morbid, acute dissections of the descending thoracic aorta (Stanford B) are associated with 10% to 25% 30-day mortality [7].

The most critical findings that affect initial intervention and prognosis are obtained on CT scan [8]. Most type A dissections are surgical emergencies and require open replacement of the ascending aorta with or without replacement of the aortic root or arch; uncomplicated type B dissections have classically been treated medically with strict control of blood pressure, heart rate, statins, and lifestyle modification [2]. Surgical treatment has been reserved for complicated type B cases (associated with rupture or malperfusion syndromes), by open surgical repair or thoracic endovascular aortic repair [2].

CLINICAL CASE

A 55-year-old male patient with a history of diabetes mellitus, systemic arterial hypertension, alcoholism, smoking, non-ST-segment elevation acute coronary syndrome, and a bifemoral aortic stent for 2 years. On interrogation, he reported episodes of generalized oppressive abdominal pain, of intermittent onset for 2 years, with no other added symptoms. On physical examination, the abdomen was soft, depressible, without pain on mid and deep palpation, without tumors or plastrons, with normal audible peristalsis, without murmurs.

Within the study protocol, CT angiography was performed, in which Stanford B and DeBakey IIIB aortic dissection was documented; so it was decided to resolve with hybrid surgical procedure.

In a first surgical stage via median stereotomy and without cardiopulmonary bypass, supra-aortic trunk anastomosis was performed (**Fig. 1**), with polytetrafluoroethylene graft to the ascending aorta.

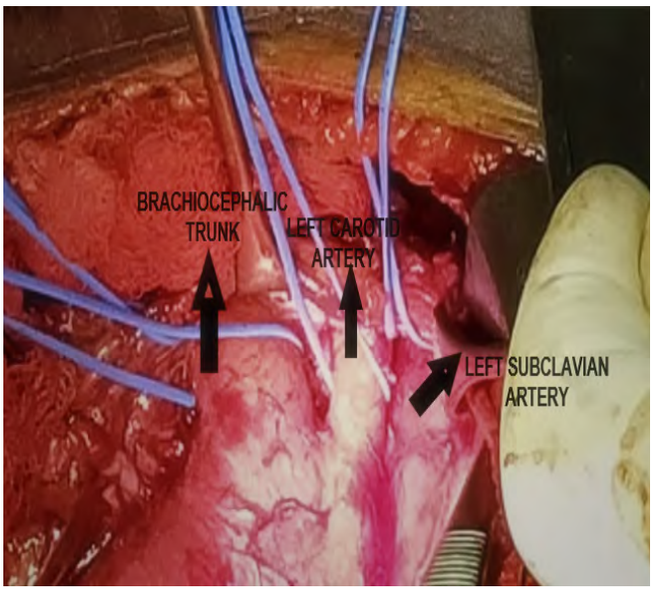

Figure 1. During dissection, vascular structures are identified: the brachiocephalic trunk, left common carotid artery and left subclavian artery.

To the brachiocephalic trunk a ringed graft was placed, then to the left carotid and left subclavian distal anastomosis was performed with a bifurcated graft, the distal anastomosis of the subclavian was implanted via transpleural route (**Fig. 2**). The proximal graft was connected "en bloc" to the aortic root.

The patient was taken to the coronary unit and successful extubation was achieved 5 hours after the immediate postoperative period.

In a second surgical procedure 48 hours later, through the right femoral approach, a 20 cm x 40 mm stent was introduced and positioned in the aortic arch, sealing the complex

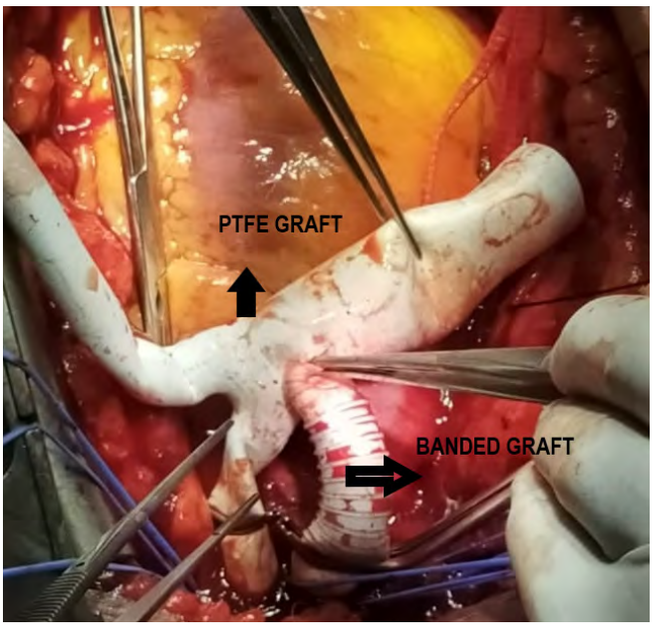

Figure 2. During the procedure the end-to-side anastomosis of the PTFE graft and the banded graft is performed.

dissection of the arch (**Fig. 3**). A second stent of the same caliber is introduced and released to seal the celiac trunk, which was previously identified (**Fig. 4**). Adequate functionality of the unbranching and permeability of the celiac trunk is verified.

The patient left the intensive care unit after four days and was discharged from hospital two days later, since then he has remained asymptomatic with oral anticoagulation.

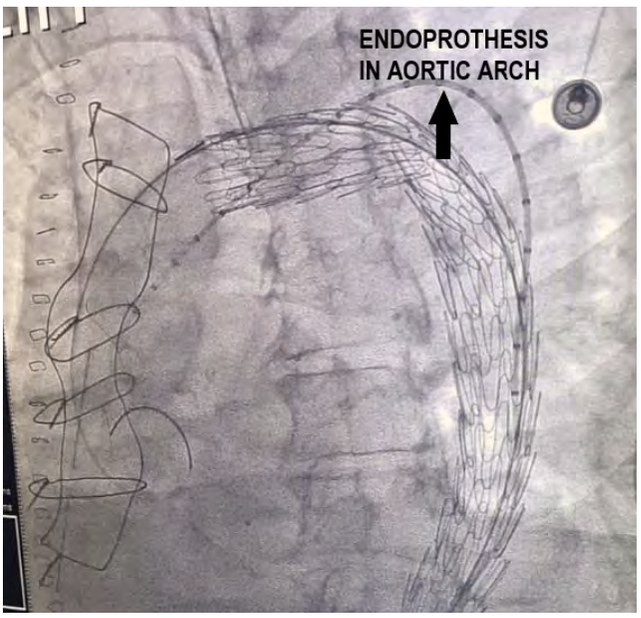

Figure 3. Transoperatively, by intervencionism the location of the endoprosthesis in the aortic arch is visualized.

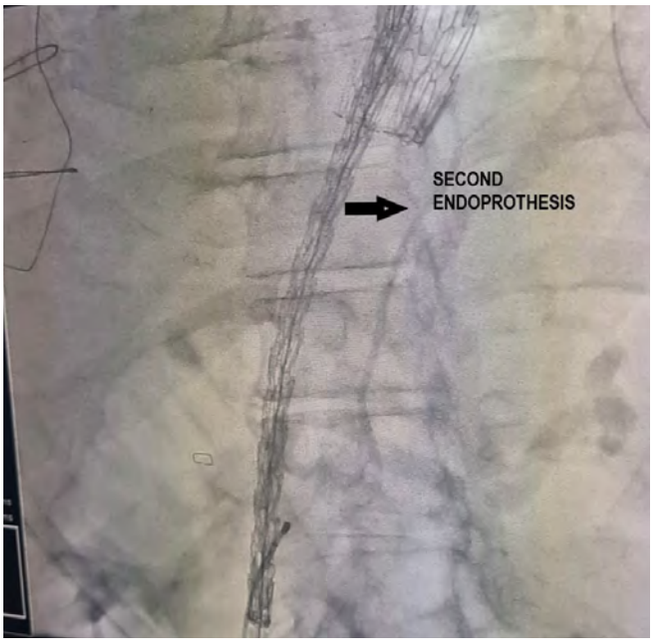

Figure 4. During de procedure, the second endoprosthesis was identified in the celiac trunk.

COMMENT

Aortic dissection is a rare pathology, with an incidence of 30 cases per million habitants per year [1]. It is part of the so-called acute aortic syndromes and is considered a pathology that deserves urgent treatment [3]. The most common associated factors are hypertension, inflammatory diseases, smoking and aortic coarctation [4]. It occurs more frequently in males, in the sixth and seventh decade of life [5], the clinical presentation is nonspecific so the diagnosis is still considered a challenge [6].

We decided to report this case being a typical presentation of aortic dissection, with a male patient in the sixth decade of life with a history of systemic hypertension, smoking and carrier of bifemoral stent for an aneurysm, referring as the only symptom abdominal pain of two years of evolution. During the physical examination without findings suggestive of the diagnosis; so it was decided to perform imaging studies which documented aortic dissection Stanford B, DeBakey IIIB. In this case it was decided to perform scheduled surgical resolution, first debranching surgery was performed and later at 48 hours by interventional stent placement, both procedures took place without complications, and finally the patient was discharged after 6 days.

FUNDING: None

DISCLOSURE: The authors have no conflicts of interest to disclose.

REFERENCES

1. Dinato FJ, Dias RR, Hajjar LA. Aortic Dissection: Clinical and Surgical Management. Rev Soc Cardiol Estado de São Paulo. 2018;28(3):260-266. doi: 10.29381/0103-8559/20182803260-6.
2. Williams ML, de Boer M, Hwang B, et al. Thoracic endovascular repair of chronic type B aortic dissection: a systematic review. Ann Cardiothorac Surg. 2022;11(1):1-15. doi: 10.21037/acs-2021-taes-25.
3. Michaelis W, Filho ALS, Yokohama RA, et al. Stanford B aortic dissection: case report and literature review. J Vasc Bras. 2017;16(3):252-257. doi: 10.1590/1677-5449.00017.
4. Fleischmann D, Afifi RO, Casanegra AI, et al; American Heart Association Council on Cardiovascular Radiology and Intervention; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Clinical Cardiology; and Council on Cardiovascular Surgery and Anesthesia. Imaging and Surveillance of Chronic Aortic Dissection: A Scientific Statement from the American Heart Association. Circ Cardiovasc Imaging. 2022;15(3):e000075. doi: 10.1161/HCI.0000000000000075.
5. Fukui T. Management of acute aortic dissection and thoracic aortic rupture. J Intensive Care. 2018 Mar 1;6:15. doi: 10.1186/s40560-018-0287-7.
6. Sosa Frias A, Figueredo Molina AE. Disección Aórtica Stanford B. Un Reporte de Caso. Multimed [online]. 2020; 24(6): 1366-1376. Available at: https://revmultimed.sld.cu/index.php/mtm/article/view/2011-Last accessed: Apr 20, 2023.
7. Flores-Salazar LO, Audiffred-Guzmán RA, Pacheco-Patiño MF, López-Chávez MJ, Ibáñez-Rodríguez JF, Muñoz-Maldonado GE. Open repair of abdominal aortic dissection. Case report. Medicina Universitaria 2017; 19(77): 189-193. doi:10.1016/j.rmu.2017.10.007.