



Case Report / Olgu Sunumu

Peripheral embolism in a patient undergoing modified Bentall procedure

Modifiye Bentall ameliyatı yapılan bir hastada periferik emboli

Ersin Kadiroğulları¹, Barış Timur¹, Onur Şen¹, Mehmet Kaya¹

Department of Cardiovascular, University of Health Sciences, Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital, İstanbul, Turkey

ABSTRACT

A 30-year-old male patient, who underwent Bentall De-Bono procedure due to type A aortic dissection six months ago presented to our clinic with acute lower extremity pain at rest. The warfarin dose was set to be between 2 and 3 of the international normalized ratio and the patient was discharged uneventfully after Bentall De-Bono operation. Computed tomography angiography revealed a thrombosis in the ascending aortic prosthetic graft, left iliac artery obstruction, and multiple infarcts in the spleen with an international normalized ratio of 2.2. The patient underwent reoperation and the isolated thrombus in the ascending aortic prosthetic graft was removed. Pathological examination of the material was compatible with a chronic thrombus.

Keywords: Ascending aorta; distal emboli; graft; thrombosis.

ÖZ

Tip A aort diseksiyonu nedeniyle altı ay önce Bentall De-Bono ameliyatı yapılan 30 yaşında erkek hasta, kliniğimize istirahat halinde akut alt ekstremite ağrısı ile başvurdu. Varfarin dozu uluslararası normalleştirilmiş oran 2-3 arasında olacak şekilde ayarlandı ve hasta Bentall De-Bono ameliyatı sonrası sorunsuz bir şekilde taburcu edildi. Bilgisayarlı tomografide 2.2 uluslararası normalleştirilmiş oran ile çıkan aort protez greftinde tromboz, sol iliyak arterde tıkanıklık ve dalakta multipl enfarktler izlendi. Hasta yeniden ameliyata alındı ve çıkan aort protez greftindeki izole trombüs temizlendi. Materyalin patolojik incelemesi kronik trombüsle uyumluydu.

Anahtar sözcükler: Çıkan aort; distal emboli; greft; tromboz.

The formation of an isolated thrombus in an ascending aortic graft during Bentall De-Bono procedure is rare.^[1] An isolated thrombus or a mass, not involving the prosthetic aortic valve, can occur in the graft due to kinking of the ascending aortic graft or secondary to a systemic infection.^[2] Herein, we present a case of thrombosis of the ascending aortic graft, despite being under adequate anticoagulation and the absence of any kinking or infection and discuss the surgical treatment of both ascending aortic graft thrombosis and secondary systemic embolism.

CASE REPORT

A 30-year-old male patient underwent Bentall De-Bono procedure (23-mm CarboMedics valve prosthesis conduit (Sulzer Carbomedics Inc., Austin, TX, USA) due to type A aortic dissection six months ago. The

warfarin dose was set to be between 2 and 3 of the international normalized ratio (INR), and the patient was discharged uneventfully. Sixth months after the operation, he presented to our clinic with acute pain in his left foot. The patient's INR value was 2.2. His medical history revealed that the patient used warfarin regularly and attended to his scheduled follow-up visits. Meanwhile, the patient had two episodes of transient ischemic attack (visual loss). No cardiac pathology was seen on physical examination. Distal pulses of the left foot were non-palpable. A well-functioning mechanical aortic valve was seen on echocardiography. He had also normal cardiac functions on echocardiography.

Computed tomography angiography (CTA) of the thoracoabdominal region and lower extremity was performed and demonstrated a mass compatible with a thrombus in the ascending aortic graft (Figure 1a-c),

Received: June 30, 2018 Accepted: September 04, 2018

Correspondence: Ersin Kadiroğulları, MD. SBÜ Mehmet Akif Ersoy Göğüs Kalp ve Damar Cerrahisi Eğitim ve Araştırma Hastanesi, Kalp ve Damar Cerrahisi Kliniği, 34303 Küçükçekmece, İstanbul, Turkey.

Tel: +90 212 - 692 20 00 e-mail: ersinkadirogullari@gmail.com

Cite this article as:

Kadiroğulları E, Timur B, Şen O, Kaya M. Peripheral embolism in a patient undergoing modified Bentall procedure. Turk Gogus Kalp Dama 2018;26(4):642-645.

©2018 All right reserved by the Turkish Society of Cardiovascular Surgery.

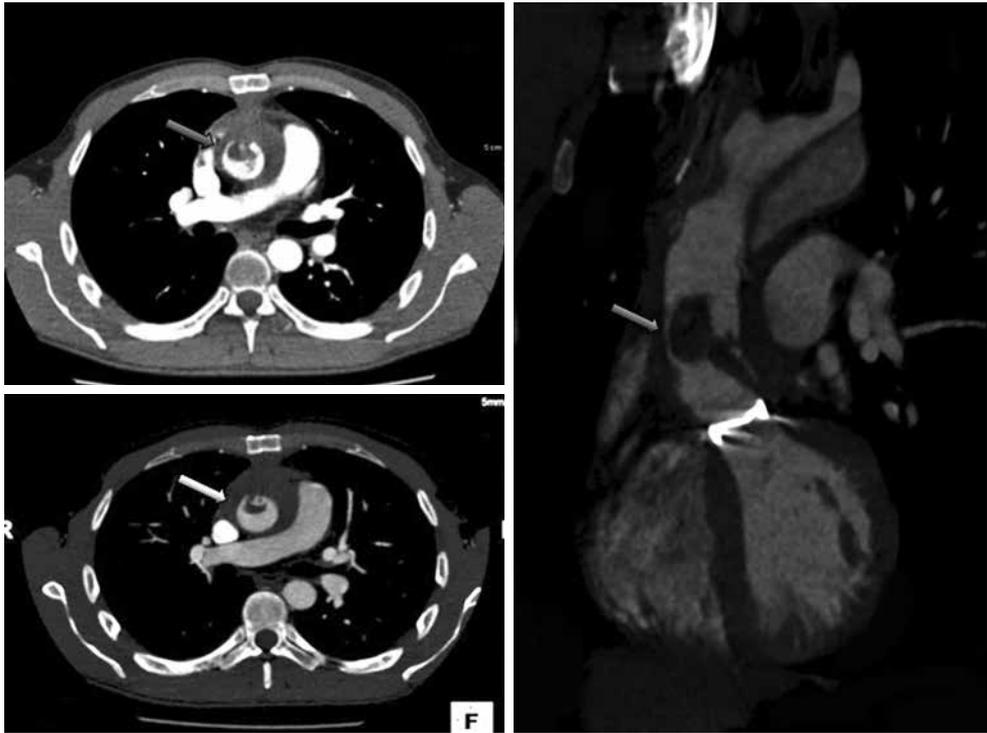


Figure 1. A computed tomographic angiographic image of thrombus in the Dacron graft located in the ascending aorta.

left common iliac artery obstruction (Figure 2a), and multiple infarct areas in the spleen (Figure 2b). Inflammatory markers and coagulation test results were within the normal range. Reoperation was decided. A written informed consent was obtained from the patient.

The heart and aorta were reached by median sternotomy following the right femoral artery and vein cannulation. The distal part of the ascending aortic graft was incised from the previous anastomosis site under deep hypothermic circulatory arrest. The ascending aorta graft was filled with a thrombus

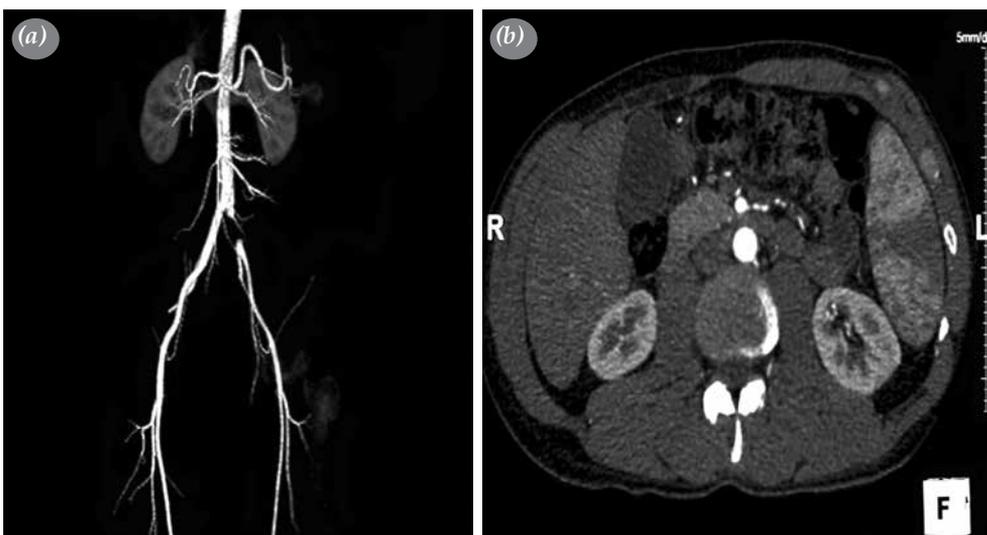


Figure 2. (a) Total occlusion of the left iliac artery. (b) Splenic infarct areas.

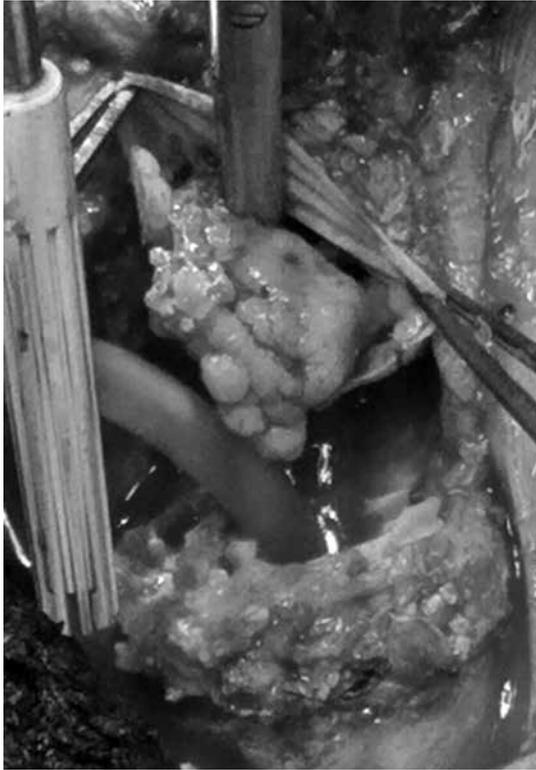


Figure 3. An intraoperative image of thrombus material inside the ascending aortic graft.

(Figure 3). The thrombus material was removed. The graft and native aortic tissue were re-anastomosed to each other. The deep hypothermic circulatory arrest was terminated at 25 min. At the end of the procedure, a left femoral incision was made. The left common femoral artery (CFA) was reached. Rubber slings were passed around the CFA, superficial femoral artery, and deep femoral artery. Angled vascular clamps were applied. Arteriotomy to CFA was made. The in-flow in CFA was poor. A 5-French (Fr) Fogarty catheter was passed and embolectomy was performed. At the end of the intervention, the distal low extremity pulses were palpable. The patient left the operating room without any need for inotropic support and stayed in the intensive care unit for two days. Specimens taken during the operation were sent to the pathology and microbiology labs. No microbial growth was seen in the microbiology lab. The platelet parameters and genetic markers of thrombophilia panel [Factor V Leiden, MTHFR (C677T, A1298C), PAI-1, β -Fibrinogen, Factor XIII A (V34L), Glycoprotein IIIa (L33P)] were evaluated, and no coagulopathy was observed. The warfarin dose was adjusted to be between 2 and 3 of the INR. The patient was discharged from the hospital uneventfully on postoperative Day 8.

DISCUSSION

Isolated thrombus in the ascending aortic graft, independent from the mechanical aortic valve, although seen rarely, is a complication with high morbidity and mortality, and necessitates emergency intervention. Thrombosis of ascending aortic grafts may result from several reasons, and the most common ones include kinking of the ascending aortic graft, the presence of severe systemic infection with agents such as *Candida* and *Aspergillus*, coagulation disorders, and cessation of the anticoagulation therapy.^[1-3]

Ascending aortic graft thrombosis may present with a clinical picture related to a distal embolism in the early or late period. In the case presented here, the initial sign of graft thrombosis was acute left foot pain which started six months after the operation. The findings of the CTA, such as left iliac artery obstruction and the presence of multiple infarcts in the spleen, demonstrated the effects of the distal embolism.

In cases with thrombosis of the prosthetic ascending aortic graft and a distal embolism, early suspicion is vital and all infection parameters should be examined. In our case, we also evaluated all infection parameters and microbiological cultures, which all yielded negative results.

Since our patient had a high risk for surgical mortality, we preferred a systematic treatment strategy rather than a radical surgery, based on the absence of signs of a systemic infection and presence of negative preoperative cultures. In patients with positive culture results for *Candida albicans* or *Aspergillus spp.*, all the prosthetic materials should be removed and a reconstructive surgery with homografts should be performed.

Catastrophic cases can be also seen presenting with myocardial infarction along with ascending aortic Dacron graft thrombosis.^[4] Furthermore, a thrombus in the native aortic tissue can occur secondary to hypercoagulability.^[5] If the thrombosis of the ascending aortic graft occurs without any coagulation disorder, early emergency surgery is necessary to prevent distal embolism. The surgical strategy should be planned according to the clinical picture of the patient and the status of systemic infection. The surgeon should not refrain from radical surgery, if necessary.

In conclusion, isolated thrombus in the ascending aortic graft is a rare, but fatal phenomenon. Early suspicion is vital. Infections and hypercoagulability should be ruled out in the differential diagnosis. If thrombosis occurs without any coagulation disorder, emergency surgery is required.

Declaration of conflicting interests

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

Funding

The authors received no financial support for the research and/or authorship of this article.

REFERENCES

1. Wahba A, Ødegård A, Skjetne K, Dalen H. Late thrombosis of a kinked ascending aortic graft. *Eur J Cardiothorac Surg* 2014;46:140.
2. Calcaterra D, Bashir M, Gailey MP. Ascending aortic graft thrombosis and diffuse embolization from early endoluminal *Aspergillus* infection. *Ann Thorac Surg* 2012;94:1337-9.
3. Nicolini F, Maestri F, Fragnito C, Belli L, Malchiodi L, Venazzi A, et al. Early neurological injury after cardiac surgery: insights from a single centre prospectivestudy. *Acta Biomed* 2013;84:44-52.
4. Brantley H, Kypson AP. Catastrophic ascending aortic graft thrombosis. *Eur J Cardiothorac Surg* 2013;43:1265.
5. Pousios D, Velissaris T, Duggan S, Tsang G. Floating intra-aortic thrombus presenting as distal arterial embolism. *Interact Cardiovasc Thorac Surg* 2009;9:532-4.