

Endovascular Treatment of Acute Abdominal Aortic Thrombosis after Cisplatin-Based Chemotherapy

Haruhiko Akagi^{1*}, Hiroshi Irie¹, Yoshihisa Nakao¹, Mitsunori Kaneko¹, Kei Sakai¹ and Shoji Sakaguchi²

¹Department of cardiovascular surgery, Yao Tokushukai General Hospital, Japan

²Department of radiology, Matsubara Tokushukai Hospital, Japan

Abstract

A 75-year-old male received preoperative cisplatin-based adjuvant chemotherapy for advanced gastric cancer. Three days after administration of cisplatin, the patient presented severe abdominal pain and calf claudication. A multidetector computed tomography (MDCT) revealed a floating mass in the infrarenal abdominal aorta. Considering the underlying malignant disease and subsequent laparotomy, we adopted endovascular treatment as a less invasive treatment: Fogarty thrombectomy followed by stent graft exclusion. Although cisplatin-based chemotherapy is known to be a high risk thromboembolic event, acute thrombosis of the aorta is exceedingly rare and its standard therapeutic management is not well established. We believe this procedure will prove to be a reliable less invasive treatment for this entity in cases of high-risk, such as with cancer patients.

Keywords: Acute aortic thrombosis; Malignancy; Cisplatin; Endovascular treatment

Introduction

Although cisplatin-based chemotherapy is known to be a high risk of thromboembolic event, acute thrombosis of the aorta is exceedingly rare [1]. This pathology may cause serious thromboembolic complications, but its standard therapeutic management is not well established. We herein present a case of occlusive abdominal aortic thrombosis after cisplatin-based chemotherapy in a patient with gastric cancer, who was successfully managed with endovascular treatment.

Case Report

This case report was approved by the Institutional Review Board (IRB) of our hospital.

A 75-year-old male received preoperative cisplatin-based adjuvant chemotherapy for advanced gastric cancer. Three days after administration of cisplatin, the patient presented severe abdominal pain and calf claudication. A multidetector computed tomography (MDCT) revealed a floating mass in the infrarenal abdominal aorta (Figure 1A-1C), which had not been observed 2 weeks before cisplatin administration began. An echocardiography and a vascular ultrasound imaging revealed no other thrombus in the heart and the peripheral vascular system. He had no evidence of a hemostatic disorder. Because of the mass showed no decrease in size with intravenous anticoagulation with heparin, the decision was made to urgently remove the mass to prevent further distal embolism. Considering the underlying malignant disease and subsequent laparotomy, we adopted endovascular treatment as a less invasive treatment.

Under general anesthesia, bilateral common femoral arteries (CFAs) were exposed. An 8Fr introducer sheath was inserted through the left CFA. A 14Fr introducer sheath was inserted through the right CFA. After systemic heparinization, bilateral CFAs were clamped distal to the sheath insertion site to prevent the lower extremity embolization. The left common iliac artery (CIA) was catheterized with a 5Fr Fogarty[®] arterial embolectomy catheter (Edwards Lifesciences, Irvine, CA, USA) and was occluded at the origin with the balloon to prevent thrombus aberration. A stiff 0.035-inch wire was advanced into the thoracic aorta via the right CFA under fluoroscopic guidance,

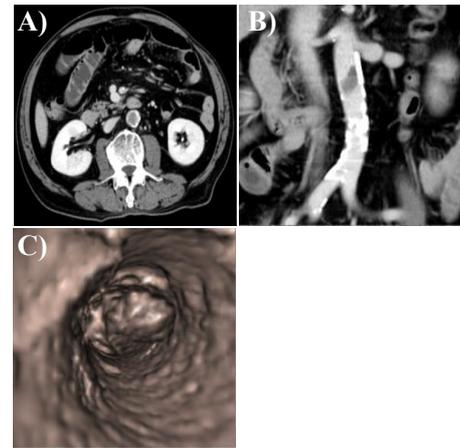


Figure 1: A multidetector computed tomography (MDCT) revealed a floating mass in the infrarenal abdominal aorta occupying the lumen. **A)** Axial section. **B)** Sagittal section. **C)** Three dimensional virtual intraaortic endoscopy imaging.

followed by a GekiraXb[®] balloon catheter (30 ml; Cosmotec Co., Ltd, Tokyo, Japan) insertion. The mass was removed according to the Fogarty thrombectomy technique through the right CFA with the GekiraXb catheter. Careful attention was given to the passage of wires and catheters to avoid dislodging emboli. The 14Fr introducer sheath was withdrawn out of the right CFA with the balloon catheter, thus allowing the forward bleeding to flush out the debris. The left CFA

***Corresponding author:** Haruhiko Akagi, Department of Cardiovascular Surgery, Yao Tokushukai General Hospital, 1-17, Wakakusacho, Yao-shi, Osaka, 581-0011, Japan, Tel: +81-072-993-8501; Fax: +81-072-993-8567; E-mail: haruhiko.akagi@hotmail.co.jp

Received July 27, 2013; **Accepted** August 08, 2013; **Published** August 10, 2013

Citation: Akagi H, Irie H, Nakao Y, Kaneko M, Sakai K, et al. (2013) Endovascular Treatment of Acute Abdominal Aortic Thrombosis after Cisplatin-Based Chemotherapy. J Vasc Med Surg 1: 111. doi: [10.4172/2329-6925.1000111](https://doi.org/10.4172/2329-6925.1000111)

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Figure 2: A postoperative MDCT shows complete removal of the thrombus and good stent-graft position (RAO view).

was flushed out in the same manner. An aortic extension (25-25-75 mm) of IntuiTrak Powerlink System® (Endologix Inc, Irvine, CA, USA) was then inserted into the abdominal aorta through the right CFA. After the position was confirmed angiographically, the stent graft was deployed just below the renal arteries to cover the thrombus attachment site. Frozen section examination confirmed the mass to be an organized thrombus without the evidence of malignancy. The final angiogram showed good stent-graft position distal to the origin of the renal arteries. There was no evidence of visceral, spinal cord, or limb ischemia after the procedure.

A postoperative MDCT showed complete removal of the thrombus as well as coverage of the atherosclerotic diseased mural surface of the abdominal aorta (Figure 2). The patient had an uncomplicated postoperative course and underwent D2 gastrectomy 12 days later. He was placed on long-term oral anticoagulation with warfarin and aspirin, and was discharged home 9 days after the second surgery. At a 3-month follow-up, no thromboembolic events were observed.

Discussion

The increased risk of thromboembolic events in patients with malignancy is well documented. Chemotherapy, in particular cisplatin, is considered to be one of the most significant risk factors [1,2]. A large study documented that patients with cancer receiving chemotherapy have a risk of thromboembolic events 6 times that in the non-cancer population [2]. However, acute thrombosis of the aorta is exceedingly rare. Although this entity may cause major thromboembolic complications, there is no standardized treatment. Thrombolysis and anticoagulation have been used with variable success, but they carry the risk of distal embolism caused by partial lysis and dislodgement of the thrombus. Simple thrombectomy according to Fogarty has declined in importance because of the high recurrence rate [3]. Accordingly, surgical removal is recommended as the treatment of choice. However, the poor general condition of patients with cancer may sometimes be less suited to open surgery. In such a situation, endovascular treatment will prove to be a preferred mode of management. In recent years, several reports have described the efficiency of stent graft exclusion of the thrombus [4-8]. The advantage of this technique is not only to exclude the thrombus but also to cover the underlying atherosclerotic aortic wall to prevent the recurrence. The disadvantages are 1) inability of mass pathological examinations, which are necessary

for differentiation between the thrombus and the aortic tumor, and 2) possible distal embolism and migration of the device caused by lodged thrombus between the stent graft and the aortic wall. In the present case, we performed Fogarty thrombectomy followed by stent graft exclusion because of the unknown pathology and the large amount of the mass occupying the aortic lumen. The procedure was performed successfully and the patient underwent subsequent gastrectomy without wasting strength and time.

Because stent graft placement for the acute aortic thrombosis is rarely reported, there are no guidelines of postoperative management for anticoagulation. Anticoagulation therapy will need to be guided on an individual patient basis. In the present case, we performed postoperative anticoagulation therapy considering the underlying malignant disease and advanced atherosclerotic disease.

Conclusion

Endovascular treatment will prove to be a reliable less invasive treatment for acute abdominal aortic thrombosis in cases of high-risk, such as with cancer patients.

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