Endovascular Stent-graft Placement for the Emergency Treatment of Ruptured Descending Aortic Aneurysm

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Abstract

Ruptured aortic aneurysm is a condition that requires emergency treatment because of its high mortality rate. In this case, we presented the emergency endovascular treatment of a ruptured descending thoracic aortic aneurysm. A female patient, admitted to the emergency with sudden onset back pain, was treated by emergency endovascular stent-graft after CT angiography examination. According to endovascular treatment, surgical treatment has a high mortality and morbidity rate in the treatment of the ruptured descending thoracic aortic aneurysms. The endovascular stent-graft treatment is applied safely and successfully to the intervention of this pathology. (*JAEM 2014; 13: 97-8)*

Key words: Ruptured thoracic aortic aneurysm, endovascular stent-graft

Introduction

The annual incidence of thoracic aortic aneurysm is 6 per 100,000 person-years. The possibility of aneurysm rupture was reported as 74% and the rupture-related mortality as 69% (1).

The most important complication of thoracic aortic aneurysm is rupture, and the primary aim of endovascular repair is to prevent death from aneurysm rupture (2, 3). Although the general approach to the treatment of aneurysm rupture is surgery, the thoracic endovascular stent-graft repair (TEVAR) is becoming increasingly common as a less invasive method (4, 5).

In this paper, the emergency endovascular treatment of the ruptured descending thoracic aortic aneurysm is presented.

Case Presentation

A 65-year-old female patient was admitted to the emergency department with complaints of sudden onset back pain and shortness of breath. In the posterior-anterior (PA) chest roentgenogram, the left lung area was closed (Figure 1-A). In the computer tomographic angiography (CTA) examination, a multilobulated, short-segment fusiform aneurysm of the descending thoracic aorta was found. The left pleural cavity was filled due to bleeding and the lung was found to be completely atelectatic (Figure 3-A). The patient was taken to the angiography room for emergency endovascular treatment. The aneurysm was treated with an endovascular stent-graft (Talent, 32 * 157 mm) following the localisation of the patient's right femoral artery (Figure 2). Then a catheter was inserted into the pleural space to evacuate the patient's left hemothorax. A postoperative CT scan taken on the third day showed no endoleak, a decrease in hemothorax and correspondingly a decrease in atelectasis (Figure 3-B). The patient was discharged on the fifth postoperative day upon recovery of the clinical features and laboratory values. The PA chest roentgenogram taken in the sixth month demonstrated complete disappearance of the hemothorax and atelectasis (Figure 1-B).

Discussion

Aortic aneurysms, morphologically divided into two groups: fusiform and saccular form, largely occur in the elderly population due to hypertension and atherosclerosis. Growth of the diameter of the descending thoracic aorta to 4 cm is considered to be an aneurysm and growth to 5 cm creates an indication for intervention (2).

EVAR application started in the 90s with increasing prevalence. Although long-term results are not known, short duration of hospitalization, less blood loss, less need for blood transfusions, reduced time to extubation, and no need for aortic clamping provides advantages when compared to surgery (3, 5-7). On the other hand, aortic

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Received: 28.03.2012 **Accepted:** 30.04.2012 **Available Online Date:** 27.02.2013

DOI:10.5152/jaem.2013.004

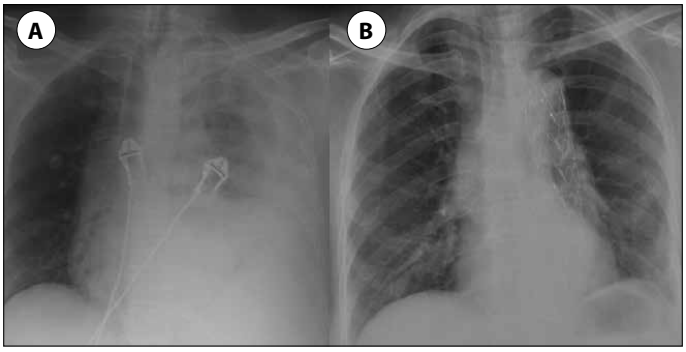

Figure 1. Ruptured descending thoracic aortic aneurysm: PA chest radiograph taken (A) before treatment and (B) in the sixth month after treatment. Roentgenogram taken after endovascular stent-grant repair demonstrated complete disappearance of the hemothorax and atelectasis

Figure 2. Endovascular stent-graft placement under fluoroscopy

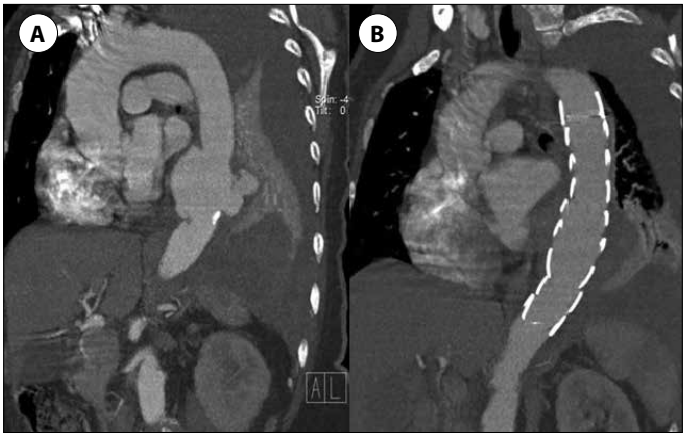

Figure 3. (A) Aneurysm filling, atelectasis and hemothorax is seen on the left lung prior to the thoracic endovascular stent-graft placement. (B) A postoperative CT scan taken on the third day showed no endoleak, decrease in hemothorax and a corresponding decrease in atelectasis

dissection, microembolization, arterial perforation, access site hematoma, pseudoaneurysm, and endoleak are disadvantages of the endovascular treatment (5, 6). Endoleak, which means continuation of flow within the aneurysm sac, is the most common complication of the TEVAR method (4, 5). Type 1 and type 3 endoleak, which cause direct perfusion of the aneurysm sac, and type 2 endoleak, which is seen as a result of retrograde flow to the aneurysm sac via patent side-branches, may occur. While follow-up is adequate in type 2 endoleak, an additional stent-graft placement or intervention through coiling should be done in type 1 and type 3 endoleak (5). In our case, CT angiography examination taken on the third postoperative day, and other controls showed no flow to the aneurysm.

The ruptured descending thoracic aortic aneurysms are lesions that require immediate treatment because of high mortality and morbidity. In open surgical operations, mortality rates reach 50%. In comparison to surgery, morbidity and mortality rates have been reported to be lower in endovascular treatment (5, 6). In two different studies carried out for cost analysis, the costs and mortality rates were reported to be lower compared to surgery (8).

As a result, compared to surgery, endovascular stent-graft treatment reduces transaction costs with the decrease in length of hospital stay, blood loss, need for transfusion, operation time, morbidity and mortality rates. Endovascular stent-graft treatment is performed safely and successfully in the emergency treatment of a ruptured thoracic aortic aneurysm.

Informed Consent: Informed consent was obtained from the patient's relative.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - O.K.; Design - A.B.; Supervision - A.V.; Materials - N.G.; Data Collection and/or Processing - L.G.K.;Analysis and/or Interpretation - B.Ç.; Literature Review - O.K.; Writer - A.B.; Critical Review - N.G.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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