

Dissecting thoracic aortic aneurysm associated with tuberculous pleural effusion

Kyong Shil Im, Min Kyung Choi, Yong Kyoung Jeon, Jae Myeong Lee

Department of Anesthesiology and Pain Medicine, Uijeongbu St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea
Correspondence to: Jae Myeong Lee, MD, PhD. Department of Anesthesiology and Pain Medicine, Uijeongbu St. Mary's Hospital, The Catholic University of Korea, # 271, Cheon Bo-Ro, Uijeong bu-Si, Gyeonggi-Do, Korea. Email: jaemng@catholic.ac.kr.

Abstract: We present the case of thoracic aortic aneurysm associated with the tuberculous pleural effusion. An 82-year-old woman underwent emergency stent graft under a diagnosis of dissecting thoracic aortic aneurysm. Preoperative computed tomography revealed right pleural effusion supposed to be the hemothorax caused by the dissecting aneurysm. But, the effusion was sanguineous color fluid and it was determined to result from pulmonary tuberculosis. The medical team was exposed to the pulmonary tuberculosis; fortunately no one became infected. Physicians should be aware of the possibility of an infected aortic aneurysm and prepare for pathogen transmission.

Keywords: Aortic aneurysm; pleural effusion; tuberculosis

Submitted Mar 30, 2016. Accepted for publication Apr 19, 2016.

doi: 10.21037/jtd.2016.05.68

View this article at: <http://dx.doi.org/10.21037/jtd.2016.05.68>

Introduction

Dissecting aortic aneurysm associated with *pulmonary tuberculosis* is very rare. Pleural effusion combined with thoracic aortic aneurysm can be misjudged as hemothorax arising from dissection. We report a case featuring dissecting thoracic aortic aneurysm combined with tuberculosis pleural effusion. The assisting health professionals were exposed to active pulmonary tuberculosis.

Case presentation

An 82-year-old woman, 150 cm in height and weighing 54 kg visited the outpatient clinic for relief of dyspnea that began several days before. She had a history of hypertension and treatment of pulmonary tuberculosis. A chest X-ray and computed tomography (CT) revealed right pleural effusion and thoracic aortic aneurysm. The patient was sent to the emergency department for aortic aneurysm surgery. Her temperature was 36.4 °C, respiratory rate was 20/min, blood pressure was 134/90 mmHg, and heart rate was 88 bpm. In chest and aorta CT, the entire thoracic aorta was dilated and thrombus was

detected in the dissected aortic lumen. Multiple ill-defined nodular consolidations were in both lungs and a moderate amount of fluid was in the right pleural space. A mass was evident in the right adrenal gland. The patient was scheduled for an endovascular stent graft for the descending thoracic aorta. A decision was made to delay surgery of the ascending aorta until the improvement of the patient's conditions.

The patient came to the operating theater with an oxygen flow of 2 L/min via nasal cannula. She was monitored with invasive and noninvasive blood pressure, electrocardiogram, pulse oximetry, and end-tidal carbon dioxide monitoring. There was no coughing during the anesthesia induction and the patient was intubated. The anesthesia circuit included the heat and moisture exchanger bacterial/viral filter (HMEF); we changed the breathing circuit and HMEF filter for every person. Intravenous anesthesia was performed and the right internal jugular vein was cannulated. The patient was given cefuroxime 1.5 gm after skin test. Stent graft was inserted to the descending aortic aneurysm. After stent insertion, when the surgeon inserted the chest tube to the right pleural space, we anticipated that the hematoma or ongoing bleeding would be drained and

blood pressure could decrease. However, when he opened the right pleural space, only about 1,000 mL of sanguineous color fluid was drained and blood pressure did not decrease. After completion of surgery, the patient was sent to the ICU without extubation and was ventilated. She was not isolated and nursed with other patients in the ICU. The following day, the radiologist reported the chest CT indicated the possibility of tuberculous pleural effusion. Tuberculosis polymerase chain reaction results were reported as positive several days after. The patient was started on anti-tuberculosis medication.

Six weeks later, the ascending aorta and arch was replaced with the graft. Follow-up chest CT revealed the remnant leak in the distal margin of stent graft in the descending aorta. After six months of follow-up, the patient was readmitted with a rupture in the descending thoracic aorta. The stent was reinserted and after recovery, she was transferred to a sanatorium.

Discussion

Aortic dissection frequently leads to hemothorax. In the present case, when the surgeon was going to open the pleura, we had anticipated that the blood pressure would decrease and hematoma would be drained. We had considered that ongoing bleeding could be accompanied with hemothorax. But, opening of the pleura did not decrease blood pressure and pleural fluid was sanguineous in color and not bloody. And we had thought it was unnatural. We had mistaken the mass in the chest X-ray would just be the old tuberculosis lesion. There was no old chest X-ray film that could be compared. South Korea is an endemic area of pulmonary tuberculosis and an old tuberculosis lesion in a chest X-ray is totally common. And she has a history of treatment of pulmonary tuberculosis. At first we had been interested only in the aneurysm size, place, and leak point. We had no interest in the character of effusion in the chest CT and were little concerned about the past history. A more prompt diagnosis by radiologists when the chest CT was checked would have been desirable, but this is challenging in night emergency cases.

The most common cause of aneurysms is degenerative, and infectious aneurysm is very rare. Infectious aneurysm can exist in any part of the aorta (thoracic and abdominal) and arises equally in thoracic and abdominal aorta (1). Because infectious aortic aneurysm has different treatment strategy with the non-infectious cause, precise diagnosis is necessary. Gram positive and negative bacteria had been the most

common micro-organisms causing aortic infections (2), and *Campylobacter fetus*, *Listeria*, and *Coxiella* have been reported in the single center (3). *Mycobacterium tuberculosis*, *Treponema pallidum* and fungi rarely infect the aorta, but their frequency is increasing due to the immunosuppressed patients (4). Most common infected route to the aorta is the extension to the contiguous area (1). If there is the tuberculous focus, and more than one of the following symptoms suggest the tuberculous aneurysm: fever and persistent pain to the aneurysm site, hypovolemic shock or massive bleeding evidence, and a pulsatile and rapidly expanding para-aortic mass (1). Tuberculosis symptoms like cough, hemoptysis, and weight loss are not always present, and a cases in which the patient had a history of treated tuberculosis has been reported (5). Both medical and surgical therapy should be done for good results (1). Remnant cavitation after tuberculosis medical therapy can reinfect the aorta, with aneurysm rupture occurring. In such cases, lifelong anti-tuberculosis medication is necessary (6) and en bloc excision of infected tissue is important (7). Rifampicin-bonded prosthetic graft shows good results (8,9). After treatment, close follow-up is necessary given the possibility of tuberculosis and aneurysm recurrence.

The characteristics of pulmonary tuberculosis associated with aortic aneurysm include military tuberculosis, pulmonary mass, and tubercular pericardial effusion (5,10,11); our case featured pleural effusion. The most important aspect of the diagnosis is a high index of suspicion. Symptomatic tuberculous aortic aneurysm is very rare, but without prompt diagnosis, it is fatal (12). Tuberculous aneurysm tends to rapid growing and rupture (12). Our patient showed pleural effusion, but it was misdiagnosed by hemothorax arisen from the aortic dissection.

Active tuberculosis patients should be admitted and operated in a negative pressure ventilated room. The attending health professionals should wear N95 respirator masks and special care should be done not to be infected from the patient. The United States Centers for Disease Control and Prevention published 2003 guidelines for preventing the transmission of tuberculosis, including that in the operating theatre (13). Anesthesiology physicians are the highest risk group for tuberculosis exposure of the occupational groups (14). Occupational infection by tuberculosis patients has been reported in the operating theatre (15,16). In our case, after the surgery, the medical team in our hospital was not checked about the transmission of pulmonary tuberculosis. But, none became infected superficially.

Conclusions

Aortic aneurysm associated with pulmonary tuberculosis is very rare. And, pulmonary tuberculosis in a patient scheduled for emergency aorta surgery situation could be missed. Pathogen transmission is minimized by knowledge of the possibility of infection. Not all of health care providers have a role in diagnosis, but should still be vigilant.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

References

1. Long R, Guzman R, Greenberg H, et al. Tuberculous mycotic aneurysm of the aorta: review of published medical and surgical experience. *Chest* 1999;115:522-31.
2. Lopes RJ, Almeida J, Dias PJ, et al. Infectious thoracic aortitis: a literature review. *Clin Cardiol* 2009;32:488-90.
3. Brossier J, Lesprit P, Marzelle J, et al. New bacteriological patterns in primary infected aorto-iliac aneurysms: a single-centre experience. *Eur J Vasc Endovasc Surg* 2010;40:582-8.
4. Kahlberg A, Melissano G, Tshomba Y, et al. Strategies to treat thoracic aortitis and infected aortic grafts. *J Cardiovasc Surg (Torino)* 2015;56:269-80.
5. Shahabuddin S, Sami SA. Tuberculous ascending aortic pseudoaneurysm. *Interact Cardiovasc Thorac Surg* 2013;17:742-3.
6. Labrousse L, Montaudon M, Le Guyader A, et al. Endovascular treatment of a tuberculous infected aneurysm of the descending thoracic aorta: a word of caution. *J Vasc Surg* 2007;46:786-8.
7. Totsugawa T, Takiuchi H, Kuinose M, et al. En bloc resection and extended replacement of the infected aortic arch. *Gen Thorac Cardiovasc Surg* 2011;59:418-21.
8. Bandyk DF, Novotney ML, Johnson BL, et al. Use of rifampin-soaked gelatin-sealed polyester grafts for in situ treatment of primary aortic and vascular prosthetic infections. *J Surg Res* 2001;95:44-9.
9. Totsugawa T, Kuinose M, Yoshitaka H, et al. Mycotic aortic aneurysm induced by *Klebsiella pneumoniae* successfully treated by in-situ replacement with rifampicin-bonded prosthesis: report of 3 cases. *Circ J* 2007;71:1317-20.
10. Dawlatly SL, Dramis A, Sumathi VP, et al. Stewart-Treves syndrome and the use of positron emission tomographic scanning. *Ann Vasc Surg* 2011;25:699.e1-3.
11. Choudhary SK, Bhan A, Talwar S, et al. Tubercular pseudoaneurysms of aorta. *Ann Thorac Surg* 2001;72:1239-44.
12. Yavuz S, Eris C, Toktas F, et al. eComment. Aortic aneurysms secondary to tuberculosis. *Interact Cardiovasc Thorac Surg* 2013;17:743-4.
13. Schulster L, Chinn RY, CDC, et al. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR Recomm Rep* 2003;52:1-42.
14. Seidler A, Nienhaus A, Diel R. Review of epidemiological studies on the occupational risk of tuberculosis in low-incidence areas. *Respiration* 2005;72:431-46.
15. Teo DT, Lim TW. Transmission of tuberculosis from patient to healthcare workers in the anaesthesia context. *Ann Acad Med Singapore* 2004;33:95-9.
16. Akata K, Kawanami T, Yatera K, et al. In-hospital airborne tuberculous infection from a lesion of calcified pleural thickening during thoracic surgery in a patient with lung cancer. *Intern Med* 2015;54:2699-703.

Cite this article as: Im KS, Choi MK, Jeon YK, Lee JM. Dissecting thoracic aortic aneurysm associated with tuberculous pleural effusion. *J Thorac Dis* 2016;8(7):E520-E522. doi: 10.21037/jtd.2016.05.68