Case Report

High Resolution Spiral CT Scan in the Diagnosis of Pseudoaneurysm of Ascending Aorta

Iskander Al-Githmi, FRCSC [a,*], Mohammed Hariri, MD [b], Ghassan Baslaim, FRCSC [a], Ahmed Jamjoom, FRCSC [a] and Nadia Batawil, MD [c]

[a] *Division of Cardiothoracic Surgery, King Faisal Specialist Hospital & Research Center, P.O. Box 40047, Jeddah 21499, Saudi Arabia*
[b] *Department of Cardiology, King Faisal Specialist Hospital & Research Center, P.O. Box 40047, Jeddah 21499, Saudi Arabia*
[c] *Department of Radiology, King Faisal Specialist Hospital & Research Center, P.O. Box 40047, Jeddah 21499, Saudi Arabia*

Pseudoaneurysms of the ascending aorta are rare (<1%), and even are extremely rare from aortic vent site, but lifethreatening complications.

The basic methods of diagnosis are computed tomography scan and aortography. We report high resolution spiral CT may provide the best less invasive means in the diagnosis of the pseudoaneurysm of the ascending aorta originated from the aortic vent site.

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Keywords. Pseudoaneurysm; Ascending aorta; Spiral CT scan; Aortic vent fistula

Clinical Summary

A 52-year-old woman, with severe and symptomatic aortic valve stenosis, underwent aortic valve replacement with a carbomedics mechanical prosthesis. Intraoperative course was uneventful, patient was rewarmed, weaned off CPB, de-cannulated after heparin was reversed and cannulae sites were closed with 4/0 prolene purse-string sutures. The pericardium was left open and chest was closed. Two weeks later, the patient was febrile and developed purulent discharge from the sternal wound. Blood cultures grew staphylococcus aureus. Two dimensional echocardiography have shown well functioning aortic valve prosthesis and no vegetation was seen.

Computed tomography of the chest was obtained and revealed small fluid collection behind the sternum. The patient was started on intravenous vancomycin regimen and underwent urgent sternal wound re-exploration which revealed superficial purulent fluid collection but there was no deep seated infection. Sternal wound was debrided and re-wired. Intravenous vancomycin was continued and oral rifampicin was added both for 6 weeks.

Four weeks later, the patient developed localized sternal wound pain and low grade fever. A chest X-ray revealed a well-defined homogenous convex opacity on the right hilar region obliterating the right cardiac border (Fig. 1). Two dimensional transesophageal echocardiography revealed dense inflammatory soft tissue mass surrounding the aortic root. Blood cultures were negative for micro-organisms.

A contrast enhanced 5 mm cut CT scan of the chest have shown a 5 cm × 3 cm mass at the anterior and lateral to the upper ascending aorta just proximal to the aortic arch in contact with the posterior surface of the manubrium sterni. A 1 mm spiral CT scan confirmed the above finding in addition to a 2 mm communicating neck between the ascending aorta and pseudoaneurysm was localized (Fig. 2).

The patient was referred for the emergency operation. The common femoral vessels were cannulated and cardiopulmonary bypass (CPB) was established with moderate hypothermia (28 °C). Re-do sternotomy was performed, there was dense fibrous tissue adhesions and no evidence of acute inflammation or deep seated infections. The ascending aortic pseudoaneurysm was identified, surrounded with extensive fibrous tissue adhesions. The aneurysmal wall was thickened and showed no evidence of acute inflammation. The cardiopulmonary bypass was temporarily interrupted, the pseudoaneurysm was violated and the communicating neck was identified. The neck occluded with fingertip and repaired with 4-0 prolene-pledgetted interrupted mattress sutures and

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* Corresponding author at: Division of Cardiothoracic Surgery, Department of Surgery, The Chinese University of Hong Kong, General Office, 4/F, Clinical Sciences Building, Prince of Wales Hospital, Shatin, Hong Kong. Tel.: +852 2632 2629; fax: +852 2637 7974.
E-mail address: algithmi@surgery.cuhk.edu.hk (I. Al-Githmi).

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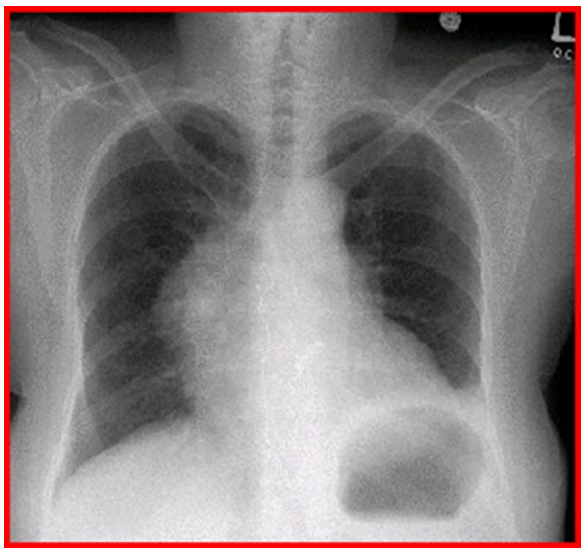

Figure 1. *Preoperative posterioanterior chest X-ray.*

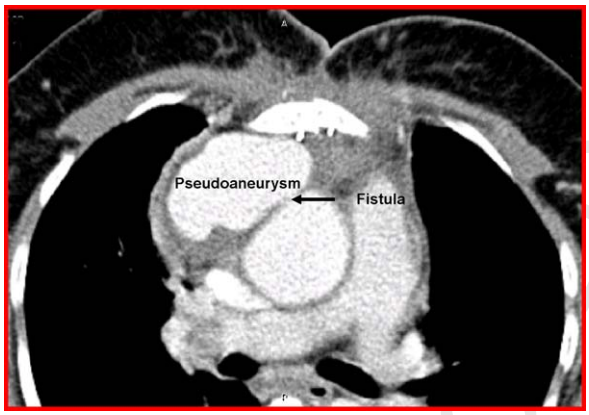

Figure 2. *High resolution spiral chest CT scan (1 mm slice).*

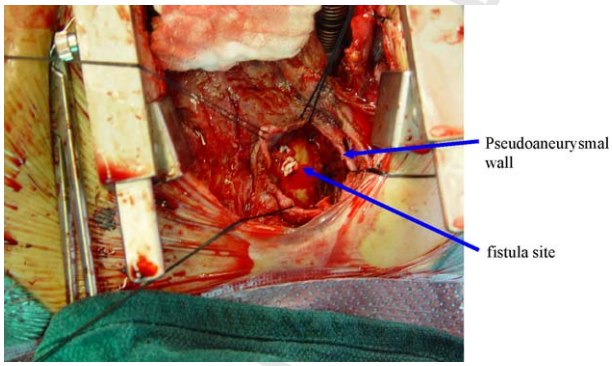

Figure 3. *Intraoperative view revealing the pseudoaneurysm fistula repair at aortic vent site.*

reinforced with Cryolife BioGlue material (Fig. 3). The patient was rewarmed, weaned off CPB and the chest was closed.

The neck of the pseudoaneurysm was located at aortic vent which was used for antegrade cardioplegia for cardiac arrest and heart de-airing at the end of the procedure.

The postoperative course was uneventful and the patient was discharged home in good condition.

The histopathology and microbiology of the pseudoaneurysmal wall were reported as degenerative changes of aortic tissue with atheroma and mural thrombus, but were negative for micro-organisms.

Discussions

Pseudoaneurysms of the ascending aorta are the result of disruption of one layer or more of the aortic wall contained only by fibrous tissue or surrounding mediastinal structures. They are mostly caused by chest trauma,[1] cardiac operations and extension of mediastinal infections, but are uncommon following cannulation for cardiopulmonary bypass,[2,3] and are even extremely rare from aortic vent site.[4] Small aortic aneurysms are often asymptomatic, but can cause compression symptoms when their size is enlarged.

The diagnosis of these serious complications are often challenging because of non-specific and late clinical presentation.[5] In our patient, the cause of the pseudoaneurysm was from the aortic vent site, and the diagnosis was confirmed by fine (1 mm) cut spiral CT scan.

In conclusion, we think that in postoperative cardiac surgery in patients with widened mediastinum, the high resolution spiral CT with 1 mm cuts are able to visualize the communicating neck and may be the best less invasive technique to diagnose the pseudoaneurysm of the ascending aorta, not only that is even to distinguish the true aortic pathology from other causes of mediastinal widening and help in the surgical approach.

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