

## Endovascular Treatment of Aortobronchial Fistula Secondary to Coronary Artery Bypass Graft (CABG)

Seyed Khalil Forouzannia<sup>\*1</sup>, Mohammad Hassan Abdollahi<sup>1</sup>, Seyed Jalil Mirhosseini<sup>1</sup>, Seyed Hossein Moshtaghion<sup>1</sup>, Habibollah Hosseini<sup>1</sup>, Majid Dehghani<sup>2</sup>, and Mohammad Hossein Mirshamsi<sup>1</sup>

<sup>1</sup> Department of Cardiovascular surgery, Afshar Hospital, Shahid Sadooghi University of Medical Sciences, Yazd, Iran

<sup>2</sup> Department of Cardiology, Afshar Hospital, Shahid Sadooghi University of Medical Sciences, Yazd, Iran

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**Abstract-** Aortobronchial fistula (ABF) is a rare and late complication of cardiac surgery. If untreated, mortality rate is approximately 100% secondary to exsanguinations haemoptysis. Early diagnosis and treatment are essential for successful management. Open surgical repair is associated with high morbidity and mortality rate, ranging from 25% to 41%. Endovascular treatments of ABF is a less invasive treatment modality and have become an important alternative to open surgical intervention in aortic pathologies. We present a case of ABF that successfully is managed by endovascular approach.

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**Key words:** Aortobronchial fistula, pseudoaneurysm, postoperative haemoptysis, endovascular treatment

### Introduction

Pathologic aberrant communication between arterial tree and adjunct structure is very rare complications after thoracic surgery especially cardiac surgery. This pathologic connection is due to long standing insitue arterial expansion. This case report is rare case of ABF according to basic a bow definition.

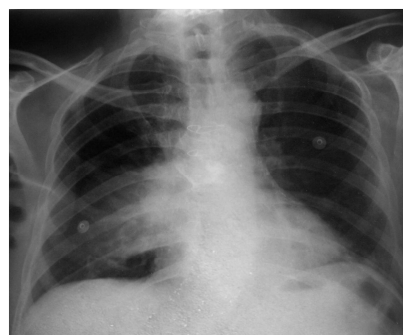
### Case Report

-A 60-year-old male was admitted to the emergency room with massive haemoptysis. The patient had a history of CABG 6 months ago with LIMA to LAD and SVG to PD and D1.

He had history of sudden chest pain 4 months after operation that was admitted to CCU and was discharged without specific diagnosis. He didn't have a history of fever, chills or productive sputum. He had massive haemoptysis and admitted to ICU six months after operation.

-Chest x-ray showed a soft tissue mass at the right mediastinal border (Figure 1).

-CT. Scan with IV contrast showed pseudo aneurysm of ascending aorta (Figure 2).



**Figure 1.** Preoperative chest x-ray with soft tissue mass at the right mediastinal border.

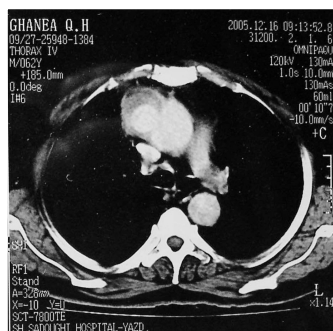
-Bronchoscopy & MRA confirmed the diagnosis of aorto bronchial fistula and bleeding site (Figure 3).

- Due to the complex anatomy and history of CABG and risk of massive bleeding and injury to graft the patient was not a good candidate for open surgical intervention.

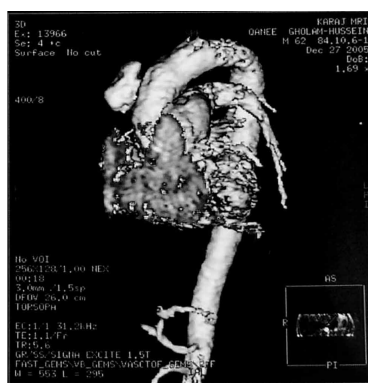
- Endovascular placement of stented graft was standard approach but because of the large size of ascending aorta (>40mm) and the orifices of SVG-grafts we selected amplatzer to close the orifice between ascending aorta and pseudoaneurysm.

\* **Corresponding Author:** Seyed Khalil Forouzannia

Department of Cardiovascular Surgery, Afshar Hospital, School of Medicine, Shahid Sadooghi University of Medical Sciences, Yazd, Iran  
Tel: +98 351 5254067, Fax: +98 351 5253335, Email: drforouzan\_nia@yahoo.com



**Figure 2.** CT. Scan shows pseudoaneurysm of ascending aorta

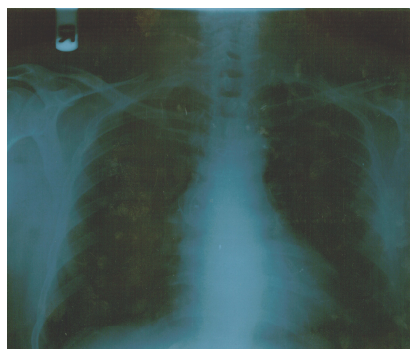


**Figure 3.** MRA shows pseudoaneurysm of ascending aorta

- Under angiographic guidance, the amplatzer was accurately placed and excluded the orifice of the pseudoaneurysm without compromising the grafted vessels and coronary arteries.

Immediately after procedure haemoptysis was controlled and he was discharged from the hospital on the 5<sup>th</sup> day postoperative without haemoptysis. Broad spectrum antibiotic therapy was administered preoperatively and for 3 weeks postoperatively.

- Chest x-ray prior to discharge and 10 months follow-up have shown decreasing the size of soft tissue mass and cessation of haemoptysis after operation (Figure 4).



**Figure 4.** Chest X-Ray after intervention

The patient did not consent CT scan angiography, and bronchoscopy for follow-up and he doesn't have any problems, 3 years after intervention.

## Discussion

The first case of ABF was described by Girard in 1914 in a patient with pulmonary tuberculosis (1) and in 1996 Chuter et al. reported successful treatment of ABF with endovascular stenting (2). To date, 24 cases of endovascular treatment of ABF have been reported by 12 groups of investigators (3, 4). But this case is the first case of amplatzer closure of ABF (5).

Aorto bronchial fistula is rare, and usually the result of pseudoaneurysms of aorta (3). Conventional repair involves a median sternotomy and cardio pulmonary bypass with the possibility of using hypothermic circulatory arrest. Although it is effective, but this approach exposes the patient to significant morbidity and mortality (6). The endovascular approaches for aortic pathologies initially began as an alternative approach for elective repair of aortic aneurysms. The high-risk patients seem to benefit from the minimally invasive endovascular approaches.

-With initial encouraging result endovascular repair is currently being evaluated for emergency use in aortic pathologies

-There is no report of emergency treatment with amplatzer. This initial experience was encouraging, but long-term result and durability of repair remain to be determined.

In this case ABF was secondary to pseudoaneurysm of ascending aorta after CABG. Mycotic aneurysms, degenerative aneurysms and postoperative pseudoaneurysms represent the main causes of ABF. The most frequent localization (92% of cases) of ABF is between the descending aorta and the left bronchial tree. The first and main symptom of ABF is intermittent haemoptysis; although less frequently, massive bleeding may manifest abruptly without warning.

Fistulous tract was rarely identified preoperatively by angiography or bronchoscopy and this technique is hazardous, as it can dislodge a sealing clot with fatal haemoptysis bleeding. Nevertheless, we think that bronchoscopy is useful in the diagnostic assessment of ABF and it should be performed with extreme care. Contrast filling of the bronchial tree after CTA is diagnostic of ABF but only seen in approximately 50% of cases. Suggestive of ABF on CT include pseudoaneurysm, aortic anatomy abnormalities, lung parenchyma consolidation and compression of bronchial

## Endovascular treatment of aortobronchial fistula secondary to CABG

tree. If not treated, ABF is uniformly fatal. The mortality of conventional surgical repair remains high 24% (1, 6).

One potential life-threatening complication for this approach is infection of device but in this case no signs of infections were detected.

In conclusion, endovascular approach provides a safe and reliable treatment of ABF, although additional follow-up is mandatory before this technique is demonstrated to be effective in the long term.

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