



## Large Posterior Ascending Aortic Pseudoaneurysm 10 Years After Cardiac Surgery

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**Abstract:** Ascending Aortic Pseudoaneurysm (AscAP) is a late and rare complication after cardiac surgery. This may occur 0.02-0.2% of after cardiac surgery procedures and the hospital mortality rate could be 6.9-15.4%. Multidetector computed tomography can provide accurate diagnoses as to the exact location and size of AscAP for surgical planning and follow-up. According to the scientific literature, the gold standard treatment is surgery but many case reports describe conservative therapy. Authors presented a case of giant posterior aortic pseudoaneurysm originating from the left side of the previous aortotomy.

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### 1. Introduction:

Ascending Aortic Pseudoaneurysm (AscAP) also known as a false aneurysm, is an outpouching of a blood vessel caused by a defect in the two innermost layers (tunica intima and media) with continuity of the outermost layer (tunica adventitia) (Sullivan et al., 1988). AscAP is a rare complication of cardiac surgery and may occur as an early or late complication of surgery and the most frequent site of occurring are anastomoses, aortotomy, or a cannulation (Atik et al., 2006). Surgical or endovascular repair are recommended but may be associated with significant morbidity and mortality (Piffaretti et al., 2015; Di Eusano et al., 2011).

### 2. Human Rights Statements and Informed Consent:

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1964 and later revisions. Informed consent was obtained from the patient for being included in the image report.

### 3. Case Presentation:

Authors reported a case of 80-year-old male with a medical history of hypertension, dyslipidemia, and diabetes. Aortic Valve replacement was performed about 10 years earlier. He recently presented to our department because of the mild chest pain during the effort. A chest radiograph was normal. A subsequent transthoracic echocardiogram (TTE) was performed and documented a suspicious retro-aortic mass. The patient was then sent for further study with Multidetector computed tomography (MDCT). the MDCT detected a 75 x 65 mm saccular AscAP, which was believed to originate from the aortotomy (Figure 1 a, 1 a). The AscAP developed caudally the right coronary artery to the posterior side of ascending aorta, where involved unusually and extensively the left a trio-ventricular sulcus (Figure 2 a, 2 b). The increasing volume of the AscAP displaced down the pulmonary bifurcation and the left branch of the pulmonary artery, compressed partially left superior pulmonary vein and left atrium (Figure 3 a, 3 b).

According to the scientific literature, in asymptomatic patients without new leakage or LV remodeling were conservative, even if the treatment of choice for AscAP is surgery. Considering the

previous cardiac surgery, the clinical a syntomacity and its associated morbidity and mortality, Authors cannot be considered the surgery negligible.



**Figure (1a).** Computed tomography, a short-axis view of the ascending aortic pseudoaneurysm. Asc Ao: ascending aorta, AoR: Aortic Root, Des Ao: descending aorta, RCA: Right Coronary artery, RPA: right pulmonary artery.



**Figure (1b).** Computed tomography, long-axis view of the large ascending aortic pseudoaneurysm locating on the posterior side of the aorta. Asc Ao: ascending aorta, LV: left ventricle, RV: right ventricle, RPA: right pulmonary artery, AVS a tri-ventricular sulcus.



**Figure (2a).** Computed tomography, sagittal view of the partial thrombosis of the ascending aortic pseudoaneurysm (arrow).



**Figure (2b).** Computed tomography, sagittal view of the maximum diameter of the ascending aortic pseudoaneurysm (7.5 cm).



**Figure (3a).** Computed tomography, a short-axis view of partial compression of the left superior pulmonary vein by the ascending aortic pseudoaneurysm (arrow).



**Figure (3b).** Computed tomography, long-axis view of partial compression of the left superior pulmonary vein by the ascending aortic pseudoaneurysm (arrow).

#### 4. Discussion:

The AscAP were reliable and life-threatening complication after cardiac surgery: the best diagnostic workup with imaging procedure and the early treatment (surgical or endovascular) reduced significantly morbidity and mortality, as reported by Piffaretti et al. (2015), "regardless of etiology, AscAPs should be treated even if they are

asymptomatic because of the high chance of rupture, bleeding fistula formation, and compression or erosion of the surrounding structures, which may be highly fatal".

According to Zipfel et al. (2011), "single piece, reversed, tapered stent grafts adapt better to the special anatomy of the hypo plastic aortic arch, midterm results are excellent; complete shrinkage in 50% is remarkable, but the long-term behavior of these implants in young patients requires further evaluation and surveillance". Therefore, Malvind et al (2013), considered the AscAP percutaneous treatment choices as percutaneous stent-graft placement, device occluder implantation, and coil embolization. "Endovascular techniques have some limitations, depending on the location of a false aneurysm and the size of the communication in the tear, stent-grafts require adequate landing zones and might not be a safe option in proximity to the coronary ostia and supra-aortic vessels". On the contrary, Piffaretti et al. (2015), reported a case report of saccular AscAP originating from cannulation site nearest coronary ostia which was excluded by new custom-design endograft.

Over the spreading and innovative endovascular therapy, the conventional surgery approached by thoracotomy or median sternotomy remained the gold standard of AscAP exclusion. More and more case reports of conservative therapy have been emerging in the scientific literature with a mean follow-up of 2 years. In particularly, this alternative observational treatment was chosen in a critical and complex patient by repeated A 6-months clinical and imaging evaluation follow-up.

### 5. Conclusion:

Comparing to the past, the treatment choice of AscAP after cardiac surgery are several: surgery, an endovascular procedure, and conservative therapy. The incidence of AscAP after cardiac surgery are less and less because of the accuracy of surgical technique and the new minimally reliable procedures. According to our experience and the scientific literature, the evaluation of all patient details (history, clinical exam) and the imaging data (high-quality MDCT and MRI, or transthoracic or transesophageal echocardiogram) should address to the better treatment choice with lowest mortality and morbidity for the patients.

**6. Conflict of interest:** None.

**7. Relationship with Industry and Financial Disclosure:** None.

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