A pseudoaneurysm, also called a false aneurysm, results from a tear in the arterial wall, with blood dissecting into the tissues around the damaged artery. This produces a perfused sac that communicates with the arterial lumen. Underlying causes include infection, inflammation (in cases of vasculitis), tumors, intravenous drug abuse, atherosclerosis, trauma, or iatrogenic injury, including surgery [4, 7]. It is an unusual but potentially fatal complication after operations on the aorta [1, 5]. The typical appearance on CECT is of a homogeneously enhancing mass, which usually presents no diagnostic difficulty. However, if a thrombus forms within the pseudoaneurysm, it may appear as a non-enhancing mass, mimicking other mediastinal mass lesions. We report a case of non-enhancing pseudoaneurysm to remind radiologists to familiarize themselves with various ways in which a pseudoaneurysm may appear on imaging.

**CASE REPORT**

A 52-year-old man had had an uncomplicated recovery after an aortic valve replacement procedure. However, about four months after surgery, he presented to the emergency department with dyspnea. Non-contrast computerized tomography (NCCT) of chest demonstrated a huge (9 × 8 × 6 cm) mediastinal mass containing a fluid-fluid level. On contrast-enhanced computerized tomography (CECT), the mass did not enhance. At surgery, a perforation was identified at the previous aortotomy site wound with a resulting aortic root pseudoaneurysm. Such a complication is rare but may occur even many years after surgery. Since rupture may lead to catastrophic hemorrhage, radiologists should be aware of this entity when investigating a mass in a patient who has previously undergone surgery of the aorta.
Postoperative pseudoaneurysm

(Fig. 3a, 3b). The mass itself did not enhance (55-65 HU on CECT and 54-68 HU on NCCT), nor was there any extravasation of contrast medium. The radiological impression was a mediastinal abscess or a gossypiboma, and the emergency surgery was performed. At operation, dehiscence of the previous aortotomy wound was seen, resulting in a pseudoaneurysm adjacent to the aortic root that had ruptured into the right pleural cavity. There were copious blood clots within the pseudoaneurysm as well as in the fistula between the pseudoaneurysm and the torn aortic wall. The pseudoaneurysm was excised and the aortic defect was repaired. The pathology report confirmed the

![Figure 1](image1.png)

**Figure 1.** Axial section of NCCT showing a cavitary mass with a central fluid-fluid level (small arrow). The lower half (large arrow) has relatively higher attenuation (55-65 HU) than the upper portion. Right pleural effusion is also seen. Note the prosthetic valve (arrow head).

![Figure 2](image2.png)

**Figure 2.** Axial section of NCCT with several foci of high density (150 HU-210 HU) (arrows) in the periphery of the mass.
operative findings. The patient recovered uneventfully and was discharged in good condition.

DISCUSSION

This case illustrates a pitfall in the radiologic diagnosis of a pseudoaneurysm, which typically enhances on CECT. Although angiography is the reference standard for the diagnosis, noninvasive modalities are preferred initially. CT may be adequate when the findings are typical. Classically, NCCT demonstrates a round structure with low attenuation arising from the involved artery. Intermediate or high attenuation adjacent to the lesion indicates hemorrhage or rupture. On CECT, the perfusing sac is filled with contrast medium with the same attenuation as the parent artery [6]. Occasionally there may be thrombus within the sac, indicated by a filling defect, but the appearance is still of an enlarged, enhancing vascular structure [4]. In our case, the CT images were atypical for a pseudoaneurysm and we initially misdiagnosed it as a gossypiboma or an abscess due to its no enhancement and clinical course. Although in retrospect, there are several interesting findings that could have provided clues to the correct diagnosis. The peripheral high density foci within the mass (Fig. 2) might have been sutures from the previous aortotomy, which should raise consideration of an aortic tear in that location. The fluid-fluid level in NCCT, with the lower level of higher density (55-65 HU) than the upper level, is consistent with a hematoma. This is compatible with the intraoperative findings of multiple clots within the pseudoaneurysm. Apparently, clots obstructed the fistula between the pseudoaneurysm and the aortic root, preventing entry of contrast medium into the sac. This would explain the failure of the pseudoaneurysm to enhance.

The reported frequency of paraprosthetic leakage producing pseudoaneurysm following valve replacement ranges from 2% to 17% [8]. This is most often attributable to mechanical rupture of the aortic sutures [9]. The interval between the initial procedure and reoperation for a pseudoaneurysm has been reported to range from 3 to 201 months [2]. The fact that it can occur as long as 17 years after aortic valve replacement is worth remembering; the possibility of pseudoaneurysm should not be dismissed just because the surgery was remote.

The critical complication of pseudoaneurysm is rupture, which may lead to a catastrophic hemorrhage [3]. This risk is greater if the lesion develops anteriorly and is situated retrosternally, where it may erode into the sternum. Operative mortality may be reduced if the surgery is planned carefully [2], but this obviously depends on making the correct diagnosis preoperatively. As this case illustrates, that’s more difficult when the CT findings are atypical. In a patient with a history of aortic surgery, the differential diagnosis of a mediastinal mass should include pseudoaneurysm, even if the mass does not enhance on CECT.

Figure 3. a. Axial section of CECT showing the mass located between aortic root (small arrow) and superior vena cava (large arrow). There is an associated mass effect but no enhancement or extravasation of the contrast medium. b. Coronal section of CECT showing the mass abutting the right atrium (large arrow) superiorly and compressing the ascending aorta (small arrow) and right atrium.
REFERENCES

1. Akgül A, Bahar İ, Babaroğlu S. Aortic Pseudoaneurysm Formation Following Multiple Valve Replacement. Turkish Journal of Thoracic and Cardiovascular Surgery 2009; 17: 293-295


