

Complicated left subclavian artery pseudoaneurysm after pacemaker implantation

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Section: Chest imaging

Area of Interest: Mediastinum Interventional non-vascular Education Lung

Procedure: Diagnostic procedure

Procedure: Catheters

Imaging Technique: CT-High Resolution

Imaging Technique: Conventional radiography

Special Focus: Trauma Case Type: Clinical Cases

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Patient: 64 years, male

Clinical History:

A 64-year-old man with a third-degree atrioventricular block was admitted to the intensive care unit to implant a transitory pacemaker. Later, an attempt to implant a permanent pacemaker using subclavian veins was unsuccessful. The next day, the cannulation of the left subclavian vein was achieved and the permanent pacemaker was implanted.

Imaging Findings:

Although the patient was asymptomatic, a chest-X-ray was performed after the unsuccessful cannulation attempt. It showed a loculated pleural effusion in the apical and lateral costal pleura and a mediastinal widening (Fig.1). The next day, after implanting the permanent pacemaker, a chest CT with multiplanar reformations and intravenous contrast-enhancement was performed. Thus, the presence of a left multiloculated pleural effusion was confirmed. This collection, with a density around 50UH, was compatible with hemothorax (Fig.2). In addition, the CT revealed a saccular mass, located in the prevascular mediastinal region between the left subclavian artery and subclavian vein. This well-defined mass had a diameter of 2.3x1.7 cm. After the introduction of contrast iv, the mass showed a homogeneous enhancement, as well as a communication with the left subclavian artery. These findings were consistent with a pseudoaneurysm of the left subclavian artery (Fig. 3-4). Finally, a stranding of the paratracheal mediastinal fat was suggestive of mediastinal bleeding.

Discussion:

Serious complications of central venous access occur in 0.4% to 9.9% of patients undergoing attempted central venipuncture. These complications include local hematoma, pneumothorax, hemothorax, hydrothorax, central venous thrombosis, air embolism, diaphragmatic paralysis, arrhythmia and cardiac tamponade due to superior vena cava or right heart perforation. Nevertheless, pseudoaneurysm formation of the great vessels and the right subclavian artery is a rare complication in patients undergoing central venipuncture [1].

A pseudoaneurysm development results from an arterial wall disruption, then blood dissects the adjacent tissues of the damaged artery causing an aneurysm sac that communicates with the arterial lumen. The sac can be contained

by the media, adventitia or the tissue surrounding the vessel [2].

Once it occurs, it can let to secondary complications, such as rupture and subsequent bleeding, arterial thrombosis, compression of adjacent structures and even fistulization through the skin.

In our case, the rapid diagnosis prevented the pseudoaneurysm progression resulting in the mentioned complications above.

Years ago, when this entity was suspected, a diagnostic angiography was used [1]. However, currently, CT with intravenous contrast allows us to locate and properly identify the neck of the pseudoaneurysm thanks to the great anatomical resolution it offers.

The treatment of this condition is generally surgical [3], in fact, a subclavian false aneurysm, even if it is small and asymptomatic, should be treated surgically without delay to prevent permanent neural damage or other associated sequelae related with this anatomical region [2].

Its classical approach requires the combination of a supraclavicular incision and resection of the clavicle, or sternotomy with a supraclavicular extension. This approach represents up to 24% of postsurgical complications and a mortality of 5-30%. Checking the patency of the contralateral vertebral artery is important to ensure an adequate flow to the basilar artery, given that the ostium of the ipsilateral vertebral artery is usually compromised by pseudoaneurysm surgical treatment. Endovascular treatment is a good alternative in which the main benefit lies in avoiding injury distally. The difficulties of dissecting this area can thus be avoided, although it is not exempt from other complications that are common with other endovascular procedures [3].

Another treatment option could be ecoguide thrombin injection, but the presence of collaterals communicating with the brain contraindicates its use in subclavian artery pseudoaneurysms due to its risk of embolization [3].

Finally, the procedure performed in this case was the placement of an endoprosthesis, resulting in a post implant technical success.

Differential Diagnosis List: Complicated left subclavian artery pseudoaneurysm after pacemaker implantation., Local hematoma, Neurogenic tumor, Lymph mass

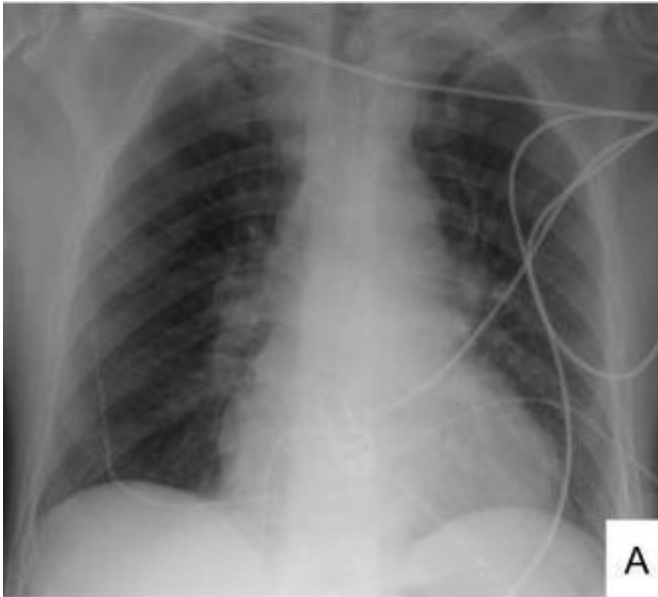
Final Diagnosis: Complicated left subclavian artery pseudoaneurysm after pacemaker implantation.

References:

- Baldwin RT, Kieta DR, Gallagher MW. (1996) Complicated right subclavian artery pseudoaneurysm after central venipuncture. *Ann Thorac Surg* 62(2):581–2. (PMID: [8694633](#))
- Tarng DC, Huang TP, Lin KP. (1998) Brachial plexus compression due to subclavian pseudoaneurysm from cannulation of jugular vein hemodialysis catheter. *Am J Kidney Dis* [Internet] 31(4):694–697. (PMID: [9531188](#))
- Fustero-Aznar JM, Castilla-Carretero JJ, Martín-Herrero EM, Laura-Guerrero MI, Miguel-Sánchez A, Buisán-Bardají JM, Duato-Jané A, Lorente-Navarro MC, Azcona-Elizalde JM (2006) Tratamiento endovascular de pseudoaneurisma subclavio iatrogénico . A propósito de un caso. *Angiología* 58(6):489–93.

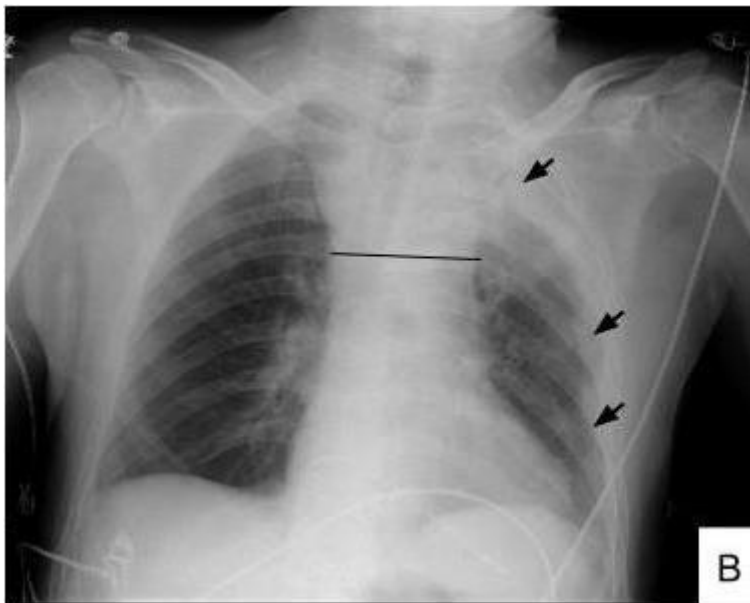
Figure 1

a



Description: A. Chest-X-ray previous to the unsuccessful pacemaker implantation. **Origin:** Department of Radiology, Hospital Morales Meseguer, Murcia. Spain.

b



Description: B. Apical and lateral pleural effusion (black arrows), as well as mediastinal thickening (black line) appeared in the control after the failed attempt. **Origin:** Department of Radiology, Hospital Morales Meseguer, Murcia. Spain.

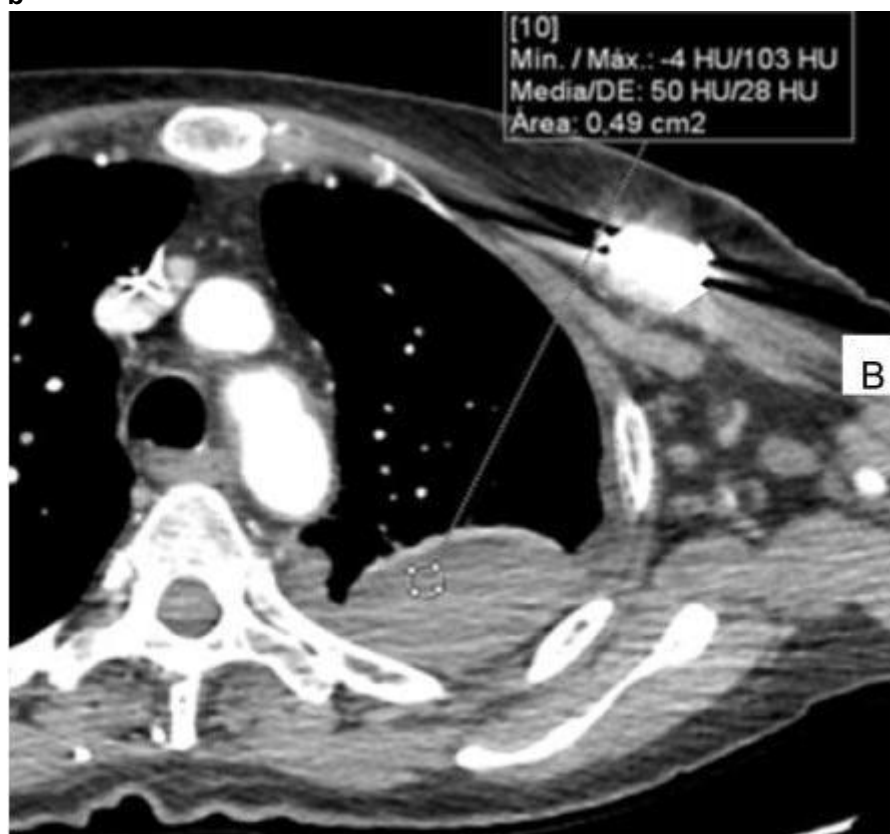
Figure 2

a



Description: A. In a coronal CT reconstruction the black arrow marks the pleural effusion located in the left apex (black arrow) **Origin:** Department of Radiology, Hospital Morales Meseguer, Murcia. Spain.

b



Description: In B and C we can see other pleural collection in different axial planes (white arrows).

Origin: Department of Radiology, Hospital Morales Meseguer, Murcia. Spain.

c



Description: In B and C we can see other pleural collection in different axial planes (white arrows).

Origin: Department of Radiology, Hospital Morales Meseguer, Murcia. Spain.

Figure 3

a



Description: A. Coronal CT plane showing a well-defined saccular mass (black arrow) with an homogeneous enhancement. **Origin:** Department of Radiology, Hospital Morales Meseguer, Murcia. Spain.

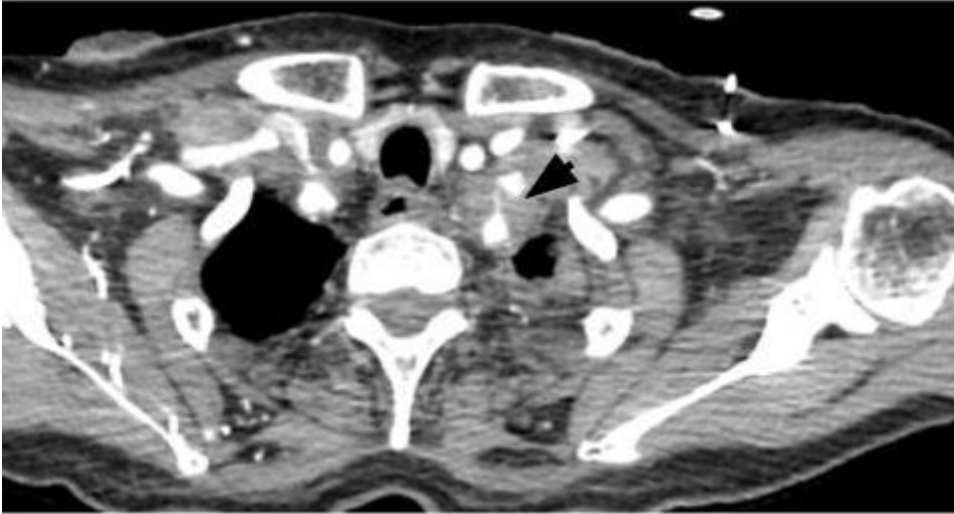
b



Description: B. Sagittal CT reconstruction in which the neck of the pseudoaneurysm can be distinguished (white arrow). **Origin:** Department of Radiology, Hospital Morales Meseguer, Murcia, Spain.

Figure 4

a



Description: Another axial plane in which we can see the homogenous enhanced mass (black arrow), located in the prevascular mediastinum. The neck is also identified in this image. **Origin:** Department of Radiology, Hospital Morales Meseguer, Murcia. Spain.