Iatrogenic dissection of the right sinus of Valsalva: A complication of coronary angiography

A 68-year-old man was diagnosed and treated for acute inferior myocardial infarction using a drug-eluting stent in the distal right coronary artery (RCA). Furthermore, a significant lesion in the mid-RCA was detected.

A week later, a second catheterisation was performed. After the third injection of contrast, a dissection occurred (Fig. 1).

Imaging Findings:

Immediately afterwards, radiological control was requested by CT angiography of the thoracic aorta. CT examination was performed with a Philips Brilliance 64-slice multidetector CT scanner. An acquisition without contrast was made first (Fig. 2), and then, intravenous contrast (100 mL; Optiray 370 mg/ml) was administered via a peripheral cannula at 5 mL/s. The CT angiography study was performed using the automatic bolus tracking technique (Figs. 3-4). The images (Figs. 2-4) showed a dissection with a length of 26 mm in the right sinus of Valsalva (arrowhead) that extended 9 mm above the sinotubular junction (striped line) with remains of catheterization contrast in its interior (arrows), being a self-limited process to said region.

Discussion:

Iatrogenic ascending aortic dissection is a very rare complication of cardiac catheterization, with an estimated incidence of 0.02% [1]. We define aortic dissection as a separation of the layers of the aortic wall by an inciting intimal injury. That is the main difference with the aortic intramural hematoma, which is confined within the medial layer in the absence of a detectable intimal tear (sometimes microtears could be present). In our case, which was an iatrogenic dissection (related with high-pressure contrast injection in right coronary artery ostium), we can assume the existence of an intimal tear and it would be therefore more correct the use of the term aortic dissection [2].

We can use the term ascending aortic dissection if it affects to any part of it, including if it is confined to the sinus. Localised dissections are usually contained below the sino-tubular junctions [3].
It is associated in more than 80% of cases with actions on the right coronary artery [4]. The origin of these dissections usually occurs in the coronary ostium or in the aortic root, and can progress both anterograde and retrograde [5]. The mechanisms remain unclear, although it has been related to the application of excessive force with catheters or guides, high-pressure contrast injections, or previous degeneration of the aortic wall [6].

Treatment depends on the extent of the dissection and the hemodynamic stability of the patient. In cases of localized dissection of the ascending, conservative management may be chosen [7]. However, some of them have rapidly progressed to extensive aortic dissection. Because of that, immediate percutaneous stenting of the perforated ostium and sealing the presumed site of entry door for aortocoronary dissection, is the preferred modality in haemodynamically stable and localised dissections [3].

Furthermore, even if there are no guidelines for treating aortic dissection caused by PCI, in a recent review which analyze 86 previous cases [8] dissections extended even to the aortic arch have been successfully treated conservatively, or nonsurgically by means of stenting. Dunning and colleagues proposed surgical intervention if a dissection extended more than 4 cm into the ascending aorta [9]. These authors [8] propose as the most important factors that guide treatment the patient's hemodynamic stability and the practitioner's rapidity in stenting the origin of the dissection, to prevent the dissection from expanding.

In our case, the dissection extended 9 mm aorta above the sinotubular junction, and given that the patient was haemodynamically stable, we decided immediate percutaneous stenting with radiological control. The findings do not modify after 5 days in control CT. After 6 months, the patient is stable and he has nor reported any events.

Written informed patient consent for publication has been obtained.

**Differential Diagnosis List:** Iatrogenic dissection of the ascending aorta, Non-dissected thoracoabdominal aortic aneurysms, Aortic regurgitation without dissection, Acute pericarditis, Acute coronary processes

**Final Diagnosis:** Iatrogenic dissection of the ascending aorta

**References:**


Description: In the second catheterisation, after the third injection of contrast, a dissection occurred (arrow)  
Origin: Department of Cardiology, Hospital Clínico Universitario Lozano Blesa. Zaragoza, Spain, 2021
Description: A) Axial, and B) Coronal images, acquisition without contrast of the thoracic aorta, show a dissection in the right sinus of Valsalva with remains of catheterization contrast in its interior (arrow).

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Origin: Department of Cardiology, Hospital Clínico Universitario Lozano Blesa. Zaragoza, Spain, 2021
Description: A) Axial, and B) Sagittal images, CT angiography of the thoracic aorta with intravenous contrast, show a dissection with a length of 26 mm in the right sinus of Valsalva with remains of blood and catheterization contrast in its interior (arrowhead) Origin: Department of Cardiology, Hospital Clínico Universitario Lozano Blesa, Zaragoza, Spain, 2021
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