An Unexpected Cause Of Acute Coronary Syndrome: Iatrogenic Right Coronary Dissection as a Delayed Complication After Valve Replacement Surgery

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Coronary artery dissection is a quite unusual but eventually life-threatening complication, which in an important number of cases has an iatrogenic cause. Most of them occur after a percutaneous procedure, and usually the right coronary artery is the one affected. We report the case of an iatrogenic right coronary dissection after valve replacement surgery. The cause was assumed to be the antegrade cannulation of the ostium for cardioplegic perfusion. What we consider particularly interesting about this case is that it had a delayed clinical manifestation, 9 days after surgery, having a normal immediate post-operative course. The diagnosis was achieved by coronary angiography, and no interventional treatment was performed.

Coronary artery dissection is a quite unusual but eventually life-threatening complication, and most cases occur as an immediate adverse event after cardiac catheterization [1, 2]. Mostly, it affects the right coronary artery, due to its anatomical disposition [3]. Rarely it can affect the LMCA (1% of all procedures), as happened in the case reported, and it can have fatal consequences if the adequate management fails to be administered. Usual treatment comprises not only percutaneous intervention, but also surgical myocardial revascularization as long as patient’s haemodynamic stability can be achieved. But not only interventional procedures can be the cause of this complication. It has also been reported to occur in the scenario of a cardiac surgery procedure, despite being a much less frequent complication [4]. In the absence of any other explanation, the cause was assumed to be endothelial lesion due to the direct antegrade cannulation of the coronary ostia, for cardioplegic perfusion. Its clinical presentation is usually intraoperative or immediate post-operative ischemia, when a rapid management and usually surgical treatment is required, but it can also show up even more than a week after surgery, becoming a very unusual complication that should be considered in these patients, when they have a post-operative acute coronary syndrome.

The case we present is an 80-year-old woman, with the preoperative diagnosis of severe aortic stenosis and moderate mitral regurgitation. She had permanent atrial fibrillation, and the angiography done in order to rule out coronary disease was normal. She underwent a mitral and aortic valve replacement; cardioplegic solution perfusion was delivered by direct cannulation through coronary ostia, with a 3-mm rigid cannula (Coronary Perfusion Cannula 9 F, Sorin Group). No unexpected events were reported during the intervention. After weaning off pump, there were no heart rhythm abnormalities or any other EKG alterations. The patient had a satisfactory post-operative course. Troponin I peak levels were within normal values in the second day after surgery (3.4 ng/mL). She was discharged the seventh post-operative day, without any chest pain during all the admission, and in a good functional class (NYHA II/IV).

Highlights

Coronary artery dissection is an infrequent complication, which in an important number of cases has an iatrogenic cause. Most of them occur after a percutaneous procedure, and usually the right coronary artery is the one affected. We report the case of an iatrogenic right coronary dissection after valve replacement surgery. The cause was assumed to be the antegrade cannulation of the ostium for cardioplegic perfusion. What we consider particularly interesting about this case is that it had a delayed clinical manifestation, 9 days after surgery, having a normal immediate post-operative course. The diagnosis was achieved by coronary angiography, and no interventional treatment was performed.

Keywords: Coronary dissection, iatrogenic, ostium, cardioplegia

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Two days after discharge, the patient was brought to the Emergency Room because of an episode of syncope, with the EKG revealing a blocked atrial fibrillation with right bundle branch block, and ST-segment elevation (Fig. 1). The lab test showed increased levels of myocardial damage enzymes (Troponin I peak level 28.2ng/mL). The patient was taken to the catheter lab for a diagnostic coronary angiography, which revealed the existence of an antegrade dissection all along the right coronary artery, with no blood flow compromise (TIMI Grade flow of 3) (Fig. 2). Since there was complete filling of the distal vascular bed, no interventional procedure was performed. The patient had a satisfactory progress afterwards with medical management, and she was discharged six days after her admission, asymptomatic and in a good functional class. No further adverse events were reported during her follow-up.

Nowadays, more elderly patients undergo major cardiac surgery, most of them with many associated pathologies; as a direct consequence of this, a bigger proportion of them have fragile tissues, atheromatosis, and calcified arterial walls. In this context, iatrogenic coronary arterial dissection is no longer an exclusive complication in the interventional field, but it’s also increasing its frequency in surgical procedures. The most frequent iatrogenic arterial dissection associated to surgery is aortic (that has been reported to have an incidence up to 0.6%). Coronary artery iatrogenic dissection is quite less common, and only some isolated cases have been reported by now. Most of them are discovered intraoperatively, or within the first 72 hours after surgery [5]. The main cause has been assumed to be in all cases the direct antegrade perfusion of cardioplegia through the coronary ostia, since the flow pressure of the perfusion along with the frailty of the coronary tissues (specially in the elderly patients) are believed to cause the arterial wall lesion. Another adverse event which has been related to these same factors is coronary ostium stenosis [6], since the cannula trauma produces a proliferative fibrosis of the arterial intima layer.

The case we report here turns out to be a late finding of this complication, which develops as an acute coronary syndrome nine days after surgery, with a syncope episode, EKG alterations and cardiac enzymes elevation. The final diagnose in this case was achieved through a coronary angiography, but a CT-scan could also be performed, especially in patients who have recently undergone surgery, as it’s a less invasive test.

Figure 1. This image shows the ECG prior to the admission of the patient in the Emergency Room, right after the syncope. It reveals atrial fibrillation with right bundle branch block. Furthermore, an ST-segment elevation can be seen in DIII, aVF and V3-V5 leads; with ST depression in aVL.

Conservative treatment can be an option for these patients (especially when it affects the right coronary artery), as long as the flow through the damaged vessel gets no compromise, with good results and no reported adverse events in the mid-term follow-up.

Declarations of interest
The authors declare no conflicts of interest.

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References