Non-surgical treatment of a coronarography-induced iatrogenic aortic dissection

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Abstract

Coronary dissection is an extremely rare but known complication of coronary catheterization and angioplasty. Due to its rarity, there are no management recommendations. However, surgery immediately after an endovascular procedure is frequently carried out under major antithrombotic treatment. The surgery and the postoperative consequences are therefore very complex. We report here the documented case of a type A aortic dissection after coronary catheterization. Despite extension to the entire ascending aorta which indicated surgical management, the benefit-risk balance argued for armed surveillance to avoid surgery under antiplatelets drugs without known antidote. We believe this case should lead us to systematically weigh the data before considering that any iatrogenic dissection of Dunning class 3 should be operated.

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Abstract:

Coronary dissection is an extremely rare but known complication of coronary catheterization and angioplasty. Due to its rarity, there are no management recommendations. However, surgery immediately after an endovascular procedure is frequently carried out under major antithrombotic treatment. The surgery and the postoperative consequences are therefore very complex. We report here the documented case of a type A aortic dissection after coronary catheterization. Despite extension to the entire ascending aorta which indicated surgical management, the benefit-risk balance argued for armed surveillance to avoid surgery under antiplatelets drugs without known antidote. We believe this case should lead us to systematically weigh the data before considering that any iatrogenic dissection of Dunning class 3 should be operated.

Introduction:

Coronary and aortic dissection is an extremely rare but known complication of coronary catheterization and angioplasty(1). Due to the rarity of the event, there is no consensus on how to deal with it. Dunning proposed in 2000 (2) a classification in 3 classes, with a proposal for management. Class 3 represents the most important disease with a dissection extended to more than 4 cm on the ascending aorta, Dunning proposes that such patients should benefit from surgical intervention because of the significant damage to the ascending aorta. This position has since been repeated in several case report publications (3,4). However, this management immediately after an endovascular procedure is frequently carried out under major antithrombotic treatment, sometimes without known antagonist treatment, and sometimes in the immediate follow-up of an acute coronary syndrome. The procedure and the postoperative consequences are therefore very complex.

Case report:

We report here the case of a 68-year-old patient. Myocardial viability assessment by dobutamine echocardiography showed an improvement in lower hypokinesia, in favor of viability of this area. The cardiology team therefore proposed revascularization of the coronary total occlusion (CTO) in a double approach using LAD and the right coronary artery (RCA). The initial examination revealed the absence of LAD restenosis. An attempt to approach the RCA is rapidly complicated by an anterograde and retrograde dissection of the right coronary artery and the aortic Valsalva sinus (Fig. 1 and Video). A stenting of the RCA ostium is then performed. After stenting, the occurrence of chest pain secondary to a hematoma of the ascending aorta is confirmed by a computed tomography (CT) scan (Fig. 2). The CT reveals a dissection of the ascending aorta, extending to the thoracoabdominal traversal. This dissection involves the supra-aortic trunks with a stenotic effect on the brachiocephalic arterial trunk (BCAT). Acquisition synchronized to the electrocardiogram (ECG) allow visualization of an entry tear in the RCA with retrograde perfusion of the false channel. The extension beyond the first 4 centimeters of ascending aorta thus places the patient in Dunning 3 class. Stable hemodynamics allow the transfer of cardiac surgery to an intensive care unit in a "tertiary center".

The platelet anti-aggregation by ticagrelor is interrupted and anticoagulation to prevent thromboembolic disease in view of the dissecting pathology is started.

In front of the iatrogenic dissection lesion, the antecedents and particularly the ticagrelor intake, in the absence of pericardial effusion, aortic insufficiency, organ malperfusion or any other sign of dissection complication, it is decided in a collegial way an extremely close surveillance.

A new imaging is performed at 24 hours and confirms the improvement with the regression of the mass effect on the real channel (Fig. 3a). The perfusion of the false channel from the ostium CD, visualized on the first CT scan and absent on the next one, is still absent on this examination.

Considering this spontaneous evolution, platelet anti-aggregation by acetylsalicylic acid is initiated the day after admission. Preventive anticoagulation is also started the day after admission, after evidence of cessation of blood flow in the aortic root dissection. Echocardiographic monitoring also confirms the absence of pericardial effusion and good aortic valve function. We decide to continue monitoring this iatrogenic dissection without surgical sanction. The CT scan is repeated after 6 days and 12 Days (Fig.3b), showing regression of the ascending aortic hematoma. She is discharged from the hospital on day 17 and is still alive 1 year later.

Conclusions:

Ascending aortic dissection is a pathology in which, despite surgical treatment, very high mortality and morbidity persist (2,5–7). However, iatrogenic aortic dissection is profoundly different from idiopathic dissection, the medianecrosis responsible for idiopathic aortic dissection is theoretically absent in these patients who require a coronary catheterization procedure.

We report here the case of a patient with iatrogenic aortic dissection secondary to a CTO revascularization procedure. The recommendation resulting from Dunning's work (2) should have led to surgical management. However, the use of extremely powerful antiplatelet agents, such as ticagrelor, is becoming increasingly frequent. Although a membranous adsorption is available (Cytosorb®), we did not have this solution available at the time of this treatment. In the absence of a solution to minimize the effects of taking ticagrelor, conservative treatment was initially motivated by antiplatelet drugs intake and given the absence of 1/significant aortic leakage 2/ pericardial effusion 3/ significant perfusion of the false channel.

Within the medical-surgical team, we decided that the balance of benefits and risks in the initial phase of management called for extremely close monitoring, especially since the operative mortality reported in these iatrogenic dissections is higher than for spontaneous dissections (5,6). We have not found in the literature any reported cases of iatrogenic dissection of Dunning class 3 treated medically. As predicted by Nuñez Gil (8), the spontaneous evolution is excellent, associated with an absence of long-term recurrence (9).

We believe that in the presence of a dissection with significant perfusion of the false channel, it would have been necessary to perform a surgical replacement of the ascending aorta. The minimal perfusion from a previously stented right coronary ostium allowed a conservative treatment subject to close monitoring.

This case should lead us to systematically weigh the data before considering that any iatrogenic dissection of Dunning class 3 should be operated. Since this wait-and-see attitude can only be done near a cardiac surgery department, we also advocate systematic hospitalization in a hospital with this type of service.

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Figures:

Fig 1: angiocoronography showing dissection induced during right coronary catheterization

Fig 2: axial (a) and multiplanar rendering (b) CT scan performed immediately after the angiocoronarography

Fig 3: CT scan after 6 and 12 days

Video: right coronary angiography responsible for aortic dissection