

Asymptomatic presentation of type A aortic dissection with complete right coronary artery avulsion: a case report.

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Abstract

Acute aortic dissection is the most challenging, life-threatening condition and requires prompt diagnosis and management. However about one-third of patients with type A acute aortic dissection (TAAAD) die within 24 hours, 50% within 48 hours and 95% die within first month. [1] Furthermore aortic dissection complicate with malperfusion syndrome is a devastating condition. Acute myocardial infarction within the TAAAD is the most fatal situation and occurs in about 1-2% of cases.[2] A total coronary artery avulsion is somewhat rare event in setting of TAAAD specially when it's asymptomatic. the authors describe a case of a young man who underwent aortic root surgery and aortic arch replacement for aortic type A dissection with complete right coronary artery avulsion completely asymptomatic at presentation.

Asymptomatic presentation of type A aortic dissection with complete right coronary artery avulsion: a case report.

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Introduction

Acute aortic dissection is the most challenging, life-threatening condition and requires prompt diagnosis and management. However about one-third of patients with type A acute aortic dissection (TAAAD) die within 24 hours, 50% within 48 hours and 95% die within first month. [1] Acute myocardial infarction within the TAAAD is the most fatal situation and occurs in about 1-2% of cases.[2] A total coronary artery avulsion is somewhat rare event in setting of TAAAD specially when it's asymptomatic. TAAAD occurs at a rate of 3-4 per 100,000 per year [3] and a delay in diagnosis, after symptomatic onset, leads to increase mortality in order of 1% to 2% per hour of misdiagnosed presentation of acute type A aortic dissection.[4] Coronary artery malperfusion has an incidence of 6-19 %. [5-8] In about 25% of patients the acute aortic syndrome occur with acute coronary syndrome (ACS) and sometimes is misdiagnosed and treated not properly. [9] Moreover patients with acute coronary involvement have an higher incidence of aortic regurgitation.

Together, aortic regurgitation and coronary artery malperfusion may lead to acute ventricular failure.[2,9] The standard approach to treat patients with aortic root and arch dissection remain the open surgical approach by hypothermic circulatory arrest and cerebral perfusion.[10] We report a case of a young patient, treated 3-years ago for acute type B aortic dissection who underwent cardiac surgery for sub-acute type A aortic dissection (De Backey type I, Stanford type A) and discuss the features of this case.

Material and Methods

We retrospectively evaluated clinical outcome, presentation and surgical technique to understand whether if it was possible an another surgical approach or further diagnostic investigation to uncover a coronary disease. The study was performed in the University Hospital of Bari, Italy and were approved by the Ethical Committee of the hospital. Written informed consent was obtained from the patient. All scientific literature were obtained from medical databases.

A 35-year old man was referred to our unit for evaluation of new onset of type A aortic dissection evidenced at CT scan in a follow up program. The patient was affected by type B acute aortic dissection treated on February 2016 with percutaneous fenestration of the false lumen. The dissection (De Bakey type III) started from thoracic descending aorta, with the intimal flap within the left subclavian artery and re-entry flap involving the iliac bifurcation. The celiac axis, the superior mesenteric artery with both renal arteries result from the false lumen. Futhermore, the origin of celiac axis and mesenteric artery were obstructed by the intimal flap with signs of incipient abdominal ischemia. These conditions were treated by fenestration of the false lumen and apposition of two stents on the origins of the arteries respectively. At control angiography after the procedure, all the arteries were patent. After this procedure the patient was admitted and underwent follow up with regular CT scan (6 month). After almost 3 years, on December 2018, the patient came back to our institution with evidence of a Type A aortic dissection at CT scan. After an accurate interrogation the patient seems to have been affected by undefined feeling of chest pain once, some weeks before. The pain wasn't so intense as to arouse suspicion, even considering the previous presentation and meticulous counseling after the first aortic dissection and, in this way, probably was mistaken for muscular pain or even flu. So the patient decided to wait for the next scheduled CT scan check-up and after telling the story he was immediately sent to our unit. In order to clarify indications for surgery the patient underwent an preoperative echocardiography that confirmed normal left ventricular (LV) function with mild aortic regurgitation. The quality of CT scan was also good enough to show an haematoma/dissection round the right coronary ostium. The haematoma seemes to involve the coronary artery with preservation of intracoronary flow. (Fig.1). Moreover, we were in possession of fenestration procedure performed near three years before with no signs of coronary artery disease. An preoperative ECG was normal, as well as levels of troponines. No signs of dyskinesia or akinesia were observed at 2D echocardiography but an imagine of intramural haematoma alongside the right coronary ostia. (Fig2).

Results

Facing on an sub-acute type A aortic dissection in 35-years old patient, after an accurate evaluation and discussion with patient, we decide to perform a complete aortic root, ascending aorta and aortic arch replacement. A classical sternotomy approach was performed with CPB in ipothermia at 22 °C, deep circulatory arrest and selective cerebral perfusion. Arterial cannulation was performed on left common femoral artery. Myocardial protection was archived by infusion of retrograde cold blood intermittent cardioplegia. On aortic cross-clamp, after opening the ascending aorta we observed a circumferential dissection of the aorta and a complete avulsion of right coronary ostium dissected protruding about 1 cm into the right sinus of Valsalva. (Fig.3). The aortic valve was also affected. Right and non-coronary commissure were completely detached. Thus, a Tirone-David valve sparing procedure was performed. Ascending aorta was replaced with 28 mm prosthetic conduit. Right coronary artery course was isolated ad obliterated within the proximal portion. Coronary artery bypass was also performed using great saphenous vein on right coronary artery and proximal anastomosis on aortic root. At 22 °C, on circulatory arrest and cerebral perfusion we performed aortic arch replacement with 26 mm vascular prothesis and the distal anastomosis on descending thoracic aorta with elephant-trunk technique. Reimplantation of epiaortic vessels was also obtained in open fascion by "island"

technique. On CPB, as rewarming, an anastomosis between the two vascular prosthesis was performed. CPB weaning wasn't really easy: the patient developed a right side post operative dysfunction and required few days on inotropes during ICU stay. Anyway at discharge, the right side dysfunction was completely resolved with no residual regional dyskinesia. No aortic incompetence were noted. The patient also underwent a CT scan control at 1 month after the surgery that confirmed a good flow in aortic root and aortic arch.

Conclusions

Generally abrupt pain chest or back pain is the most common onset of TAAAD according to IRAD and so at presentation about 80% of patient experience pain.[5] An atypical presentation of aortic dissection makes the diagnosis difficult and thus is contributing to elevated mortality associated with this syndrome.[11,12] In this case epiaortic vessels were also involved likely without clinical manifestations. By definition, malperfusion describes signs and symptoms of end organ dysfunction due to low blood flow [13]. The inflammatory cascade related to end-organ dysfunction increase significantly surgical risk. [14,15] In this case we observed a total rupture of intima, media and adventitia about one centimeter from the ostium of right coronary artery. Non signs and symptoms of ischemia were documented. The characteristics of the hematoma suggest a recent formation compatible with the diagnosis of sub-acute dissection. If it is assumed that the onset was at the time of chest discomfort about 2 weeks earlier, several days have passed before the first medical contact and admission to our ICU.

Probably, consolidation of the hematoma and a progressive increase in the false lumen stretched the right coronary so as to allow complete detachment. At the same time, however, the flow was contained by the presence of the hematoma. The patient may have had a certain degree of ischemia or angina at dissection, not recognized at the time of admission.

Another hypothesis is the perioperative detachment compatible also with the presence of right-side postoperative dysfunction as well as use of retrograde cardioplegia. [16]

To our opinion, this is the first case of totally asymptomatic subacute type A aortic dissection with right artery avulsion at presentation described in literature. We also advise surgeons, in cases of aortic root involvement, to be always ready to an unplanned myocardial revascularization.

Conflicted of interest: none

Authors contribution: all authors gave substantial contribution to study. Critical revision of data and revision of article (Aldo D. Milano), data collection and revision of article (Andriy Dralov).

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