Clinics in Surgery

Commentary
Published: 04 Oct, 2018

Acute Myocardial Infarction Ten Days after Bentall Procedure due to Coronary Embolism: Etiology Discussion and Rare Case Presentation

Paolo Nardi, Marco Russo, Monica Greci, Calogera Pisano, Guglielmo Saitto, Giulio Pellegrini, Antonio Pellegrino,Carlo Bassano, Antonio Scafuri and Giovanni Ruvolo*

Department of Cardiac Surgery, Tor Vergata University Policlinic, Rome, Italy

Abstract

Coronary thromboembolism is a rare cause of acute coronary syndromes (ACS, i.e. STEMI) and the data regarding ACS in patients with prosthetic heart valve are poor and based mainly on case report. The likelihood of this focal coronary problem with normal coronary arteries is between 1% to 5% and several mechanisms have been proposed and reported.

We here present the single case of a distal left circumflex artery embolism after Bentall procedure and hemiarch resectionin the setting of an acute type A aortic dissection successfully managed with conservative therapy and a brief comment on the actual literature.

Commentary

Coronary occlusion is a rare complication after aortic and mitral valve surgery [1]. In literature some cases of prosthetic heart valve thrombosis-derived coronary embolism have been reported and several pathophysiologic mechanisms for this kind of event have been proposed. This event represents a rare cause of acute coronary syndromes (ACS, i.e. STEMI) and the data regarding ACS in patients with prosthetic heart valve are poor and based mainly on case report [1-2]. The likelihood of this focal coronary problem with normal coronary arteries is between 1% to 5% [3].

Karakoyun and co-authors described three cases of prosthetic valve thrombosis causing non-ST elevation ACS, who was successfully treated with thrombolytic therapy [4]. Leontyev and colleagues described also a case of embolic occlusion of the left main coronary artery following an isolated aortic valve replacement treated with emergent coronary artery bypass grafting [5].

Iatrogenic Coronary Ostial Stenosis (ICOS) could be associate with several mechanisms that have been previously described. Tukiji et al. reported that immunological reaction to the heterograft was a potential mechanism causing ostial coronary artery stenosis [6-7]. More, the direct coronary perfusion for myocardial protection during aortic valve surgery may produce immediate traumatic lesions and latest stenosis of the coronary arteries. Micro-injuries and local pressure necrosis might be related to the infusion pressure of the cardioplegic solution and over-dilatation of the vessel by the selective cannulation to delivery cardioplegia. In addition, intimal thickening and fibrous proliferation in proximity to the aortic root as a reaction to the turbulent flow around the prosthetic valves, as well as particulate embolism into the coronary arteries potentially related with a sub-therapeutic oral anticoagulation in patients with mechanical prostheses (Figure 1). Symptoms of ICOS, which usually develop within 6 months of surgery, can be rapidly progressive and may include angina pectoris, left ventricle failure or acute pulmonary oedema. These complications require prompt clinical recognition and early treatment because of the possibility of sudden death.

In other cases reasons of myocardial ischemia can be acute coronary occlusion by ostial obstruction by the valve prosthesis or arterial dissection due to cardioplegia's cannula trauma. A sub-therapeutic oral anticoagulation could represent although rarely the main aetiology of an acute coronary events. Management of those complications are based on interventional or surgical procedures, or on medical therapy with thrombolytic therapy.

Here we present the case of a 53 years-old man affected by acute Type A aortic dissection underwent Bentall procedure and hemiarch resection with mechanical composite graft CarboMedics 25/28 mm,(CarboMedics, Carboseal, Livanova, Saluggia, Vercelli, Italy) due to moderate hypothermia and bilateral anterograde cerebral perfusion. A complete dissection of Valsalva sinus and both coronary

OPEN ACCESS

Correspondence:
Paolo Nardi, Department of Cardiac Surgery, Tor Vergata University Policlinic, Viale Oxford 81, 00133 Rome, Italy, Tel: +390620903536; Fax: +390620903538;
E-mail: pa.nardi4@libero.it

Received Date: *29 Aug 2018*
Accepted Date: *01 Oct 2018*
Published Date: *04 Oct 2018*

Citation:
Nardi P, Russo M, Greci M, Pisano C, Saitto G, Pellegrini G, , et al. Acute Myocardial Infarction Ten Days after Bentall Procedure due to Coronary Embolism: Etiology Discussion and Rare Case Presentation. Clin Surg. 2018; 3: 2136.

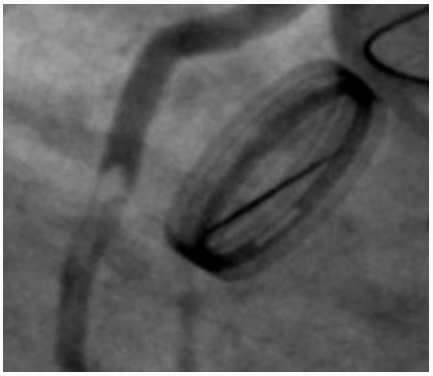

Figure 1: Coronary angiography shows the acute occlusion of the distal tract of the left circumflex coronary artery due to embolism.

ostia were also detected during surgical inspection. The immediate post-operative course was event free. Postoperative CT-scan showed optimal result of the Bentall operation and post-processing analysis showed no alterations of coronary arteries. In postoperative day 9 the patient has been transferred for rehabilitation. In POD 10, he presented a single episode of angina at rest, autonomously solved, with 1mm to 2 mm ST-elevation in inferior derivations and increase of myocardial enzymes with a peak of troponin I of 34917, 1 ng/L, and peak of CK-MB 103,20 ng/mL). The patient was under oral anticoagulation with warfarin. INR was 1,74 and 60,00 units of enoxaparin every 12 hrs had been administered subcutaneously in the previous days.

Due to the diagnosis of ST Elevation Myocardial Infarction (STEMI) he underwent coronary angiography that revealed an embolic occlusion of the distal territory of the left circumflex coronary artery, anyway with flow TIMI III, while the other coronary vessels and the reimplanted coronary ostia on the composite graft conduit were free from acute or chronic lesions. Because of presence of a distal occlusion and the stable clinical setting a conservative strategy was adopted, and a medical therapy with double antiplatelet therapy, in association with warfarin and beta-blockers, was started. A complete regression of ECG alterations and the absence of symptoms characterized the hospitalization course and the echocardiography before discharge confirmed good global left ventricular function, i.e. LVEF 0,60. Patient was discharged 5 days after STEMI. At one month of follow-up he was in optimal clinical conditions, NYHA class I, and absence of angina, without any alteration in ECG and echocardiography, and the same medical therapy was continued.

To the best our knowledge this is the first report of such complication described in the setting of a Bentall procedure for acute Type A aortic dissection and successfully treated with combination of dual antiplatelet medication in association with oral anticoagulation therapy.

Several considerations can be deduced. International guidelines suggest a target INR of 2.5 for patients with mechanical aortic valve prosthesis in absence of other risk factors. In the present case, even if the patient's INR was 1.79, the contemporary therapeutic dose of enoxaparin should cover from embolic events. Nevertheless, an aggressive oral anticoagulation should be evocated for all patients, and in some cases, addition of a low dose of aspirin could represent a valid option. This combination could decrease thromboembolic events, while on the other hand, could cause an important increase of the risk of bleeding. For this reason it was not used in the present patient according to the risk of pericardial effusion after surgical operation. More, a conservative therapy was successful in this case, most of all for the rapid and autonomous resolution of the clinical setting. In fact, the risk of the possible interventional treatment procedure with a percutaneous coronary stenting to treat the coronary occlusion should be balanced with the clinical setting of a patient recently treated for aortic dissection, in which the recent coronary ostia sutures were at possible high risk for dehiscence or fatal bleeding during guide wires manipulation.

In conclusion, even if coronary embolism is a rare cause of myocardial infarction, it should be well known and rapidly recognized in order to achieve the optimal management.

References

1. Radu NC, Kirsch EW, Hillion ML, Lagneau F, Drouet L, Loisance D. Embolic and bleeding events after modified Bentall procedure in selected patients. Heart. 2007;93(1):107-12.
2. Protasiewicz M, Rojek A, Gajek J, Mysiak A. Cardiac arrest due to left circumflex coronary artery embolism as a complication of subtherapeutic oral anticoagulation in a patient with mitral and aortic mechanical valve prostheses. Postepy Kardiol Interwencyjnej. 2013;9(1):97-100.
3. Funada A, Mizuno S, Ohsato K, Murakami T, Moriuchi I, Misawa K, et al. Three cases of iatrogenic coronary ostial stenosis after aortic valve replacement. Circ J. 2006;70(10):1312-7.
4. Karakoyun S, Gürsoy MO, Kalçık M, Yesin M, Özkan M. A case series of prosthetic heart valve thrombosis-derived coronary embolism. Turk Kardiyol Dern Ars. 2014;42(5):467-71.
5. Leontyev S, Borger MA, Battellini R, Seeburger J, Lehmann S, Légaré JF, et al. Embolic occlusion of the left main coronary artery following an isolated aortic valve replacement. J Card Surg. 2011;26(2):168-70.
6. Tsukiji M, Akasaka T, Wada N, Okahashi N, Kume T, Yoshitani H, et al. Bilateral coronary ostial stenosis after aortic valve replacement with Freestyle stentlessbioprosthesis: A case report. J Cardiol. 2004;44(5):207-13.
7. Sanghui K, Walsh C, Varghese V. Ostial left main occlusion following surgical aortic valve replacement (SAVR). J Card Surg. 2018;33(3):139-141.