International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Iatrogenic Left Main Dissection Bailout Treatment with Stenting

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Abstract: ***Catheter-induced left main coronary artery (LMCA) dissection is a rare complication of coronary catheterization and is a common cause of periprocedural mortality. Although the number of cases was small, prompt bail-out stenting for iatrogenic LMCA dissection had reportedly reversed this complication with favorable clinical outcomes. A 60-year-old male was admitted to our hospital complaining of chest pain and breathlessness. Inspite on optimal and proper medical management patient has persistant chest pain. Coronary angiography was planned to rule out coronary artery disease. Left main got dissected while doing coronary angiography. Immediately, the patient complained of severe chest pain, accompanied by ST-segment elevation on the ECG and hemodynamic condition deteriorated. Emergent bail out stenting was done with drug eluting stent of size 4.5X14mm placed in left main (LM) overlapping with 3.5X20mm in LAD, re-establishing TIMI 3 flow in LAD. The patient was stable without symptoms after the procedure. He was discharged five days later on optimal medical treatment***

Keywords: coronary angiography, left main, stenting

1. Introduction

Although catheter-induced left main coronary artery (LMCA) dissection is a rare complication of coronary catheterization, it is a common cause of periprocedural mortality. Incidence has been reported by about 0.07% [1]. Emergent coronary artery bypass surgery (CABG) is the mainstay for managing this acute complication. However, hemodynamic deterioration may progress while patients await emergent CABG; consequently, a high postoperative mortality rate has been reported. Although the number of cases was small, prompt bail-out stenting for iatrogenic LMCA dissection had reportedly reversed this complication with favorable clinical outcomes. Percutaneous coronary intervention (PCI) is considered as the best therapeutic option based on the type of dissection [3].

We report a case of a man with iatrogenic left main coronary artery dissection treated by emergency percutaneous coronary intervention (PCI).

2. Case Report

A 60-year-old male was admitted to our hospital complaining of chest pain and breathlessness. His family history was positive for coronary artery disease. Physical examination was unremarkable while laboratory data showed no abnormal finding. ECG findings are within normal limit.

Transthoracic echocardiography demonstrated normal left ventricular function without wall motion abnormalities with normal valves.

Inspite on optimal and proper medical management patient has persistant chest pain. Coronary angiography was planned to rule out coronary artery disease and performed via the right transradial approach. The left coronary artery was hooked with diagnostic 6 Fr left Judkins 4.0 catheter (Medtronic, Inc.) and a diagnostic 6 Fr right Judkins 3.5 catheter (Medtronic, Inc.) for engaging right coronary artery.

Angiography of the left coronary artery shows left main coronary artery dissection extending into LAD. (LAO cranial view) (FIGURE 1)

Figure 1

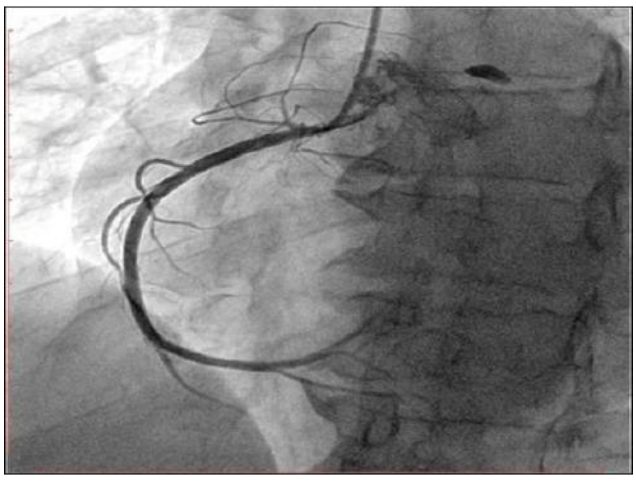

Figure 2

Angiography of the right coronary artery was normal (LAO view) but in the level of the left main (LM) was showed the presence of contrast (Figure 2).

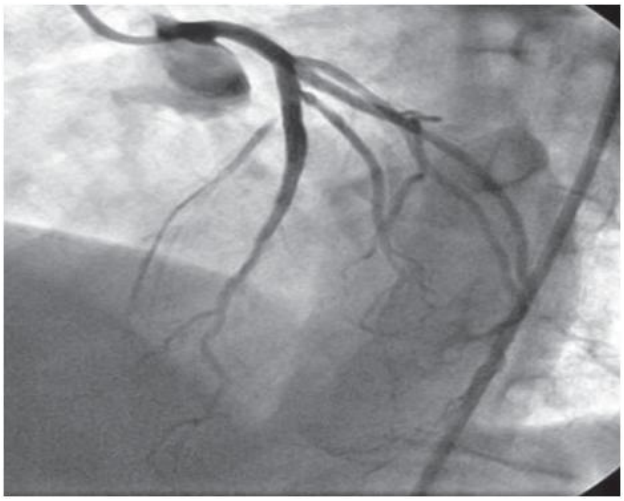

Figure 3

Immediately, the patient complained of severe chest pain, accompanied by ST-segment elevation on the ECG and hemodynamic condition deteriorated.

A right femoral approach was chosen to perform the angiography of the left coronary artery with a 6 Fr 4 JL guiding catheter (Boston Scientific) showing an acute occlusion of the left anterior descending artery (LAD) (Type F) (LAO caudal view). A 0.014" choice floppy guidewire was advanced through LMCA into the true lumen of LAD, and a drug eluting stent of size 4.5X14mm was placed in left main (LM) overlapping with 3.5X20mm in LAD, re-establishing TIMI 3 flow in LAD.

Post-dilatation was performed with a non-compliant balloon (NC-, Trek Abott) 4.5 x 10 mm Final angiography showed good results with TIMI 3 flow across the left coronary artery (FIGURE 3 LAO CRANIAL VIEW).

The patient was stable without symptoms after the procedure. He was discharged five days later on optimal medical treatment. At 15 days and 3 months clinical follow-up, he did not have any symptoms with a good clinical condition.

3. Discussion

Iatrogenic left main dissection is a rare complication during coronary angiography or angioplasty but. Risk factors for left main dissection include coronary artery anomalies, connective tissue disorders-Marfan syndrome, atherosclerotic changes-left main stenosis, arterial hypertension, bicuspid aortic valve, aortic root calcification and older age [4]. Iatrogenic left main dissection results from catheter manipulation, forceful injection of contrast medium, balloon dilatation and stenting [5], [6].
In our case, deep intubation of the diagnostic catheter with vigorous hand-injection of contrast medium may have caused left the main dissection as a result of increased wall stress. The careful position of the catheter in co-axial alignment with the artery before any vigorous contrast injection cannot be stressed enough [2], [7].

Based on NHLBI classification (The National Heart, Lung and Blood Institute) dissection of the coronary artery is divided into six types (A-F) according to an appearance on coronary angiography [8]. Clinically benign are types A and B, whereas types C through F portend significant morbidity and mortality if untreated [9]. Dunning classification of coronary artery dissection is based on the retrograde extension into the aortic root as a class I-focal dissection restricted to the coronary cusp, class II-involves the cusp and extends up the ascending aorta but is less than 40mm and class III-extends from the coronary cusp up the ascending aorta greater than 40 mm [10]. Eshtehardi's simplified classification according to the extension of left main (LM) ostial dissection includes three types of iatrogenic aortocoronary dissection (IACD): type I-a localized dissection in the LM ostium, type II-extension of the dissection from the LM into the left anterior descending artery (LAD) or left circumflex artery (LCx) and type III-extension of the dissection flap into the aortic root [1].

Left main coronary artery (LMCA) dissection may be followed with different Thrombolysis in Myocardial Infarction (TIMI) grade flow determining hemodynamic stability and clinical picture.

The alternative strategies for the treatment of iatrogenic LMCA dissection are a percutaneous coronary intervention (PCI), coronary artery bypass grafting (CABG) and conservative therapy.

Percutaneous coronary intervention (PCI) is preferred in patients hemodynamically unstable in terms of time and technique [11], [12], [13]. The quick wiring of the true lumen of the LMCA and its branches considering that the false lumen is usually larger and inadvertent stenting of the false lumen will completely occlude the coronary artery [14].

In an observational study of patients with iatrogenic LM dissection from 38 patients, 1 (3%) patient died before any therapeutic attempt was performed, 6 (16%) patients were treated conservatively, 14 patients were treated by bail-out stenting, and 17 patients were treated by coronary artery bypass grafting (CABG). There was no difference during the 5-year follow-up between bailout stenting and CABG [1]. A review of the literature with 54 patients, 50 patients was treated by bailout stenting, 4 patients were treated by CABG, and there was only 1 cardiac death [2]. In patients with iatrogenic left main coronary artery dissection hemodynamically unstable prompt management with bailout stenting is very crucial in determining favourable outcomes.

In conclusion, in patients with iatrogenic left main coronary artery dissection, the best treatment strategy is prompt recognition of this complication, hemodynamic condition of the patient and operative skills. The therapeutic strategy by bail-out stenting should be performed as promptly as possible in hemodynamically unstable patients toward acceptable results.

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