

Iatrogenic Left Main Coronary Artery Dissection in a Non-Primary Percutaneous Intervention Setup without On-Site Cardiac Surgery Backup

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Abstract

Introduction: Iatrogenic left main (LM) dissection is although a rare complication occurring in about 0.1% of cases but it leads to devastating results, as the left ventricular function is severely compromised due to abrupt cessation of the whole arterial supply of the LV. Coronary Artery Bypass Surgery (CABG) is preferable in this situation but many of times surgery is not feasible urgently due to many factors leading to delayed revascularization and especially in centers not having on-site cardiac surgery available so Percutaneous Transluminal Coronary Angioplasty remains a good option.

Case report: A 40-years-old lady with suspected angina pectoris underwent coronary angiography through right radial route. Due to deep engagement of the Judkin's catheter, iatrogenic dissection of LM Artery occurred which resulted in clinical symptoms and electrocardiographic changes. As on-site cardiac surgery was not available, percutaneous angioplasty with a Drug Eluting Stent was done successfully with good results.

Conclusion: Left Main artery dissection (LMCA) during coronary procedures, though rare, but devastating condition, can be dealt with percutaneous angioplasty even without cardiac surgery backup.

Keywords: Iatrogenic left main coronary artery dissection; On-site cardiac surgery setup; Non-primary percutaneous intervention

Introduction

Iatrogenic left main artery (LM) dissection is a catastrophic complication of coronary angiography and angioplasty that requires prompt management using stenting. Although LM dissection can be prevented, it cannot always be avoided and has a reported incidence rate of 0.02% [1].

Although rare, with a reported incidence of less than 0.1%, its occurrence can have devastating consequences if not promptly treated with immediate revascularization [2,3]. Treatment options for spontaneous coronary artery dissection include conservative treatment (medical), percutaneous coronary intervention and coronary artery bypass graft surgery still the optimal strategy for this disease process has not been clearly defined [4]. The conventional management of LMCA dissection is coronary artery bypass grafting but bailout stenting has also been shown to be life-saving in cases of acute LMCA occlusion [5,6].

Case Report

A 40-years-old lady, recently diagnosed with diabetes, with history of chest tightness for last two weeks on mild exertion, having ST-T changes in electrocardiogram, presented for elective angiography referred from a local physician. Her angiogram was started from radial route with 6 F Judkin's catheter. The first two views revealed mild ostial Left Anterior Descending artery (LAD) lesion with moderate mid Left Circumflex (Lcx) lesion but as the catheter was deeply engaged, it was withdrawn. Re-engagement again lead to deep seating into LAD leading to a suspicious haziness in the ostium of LAD (Figure 1A) which on cranial projection confirmed LM dissection extending into ostial LAD (Figure 1B).

Right Coronary Artery showed small caliber vessel with moderately tight mid stenosis. Patient developed chest pain with significant ST-T changes in electrocardiogram (ECG) and as we were not having cardiac surgery backup so percutaneous transluminal angioplasty (PTCA) was urgently planned. A JL guider 3.5 was engaged with placing of BMU wire into distal LAD with some difficulty crossing the dissection plane.

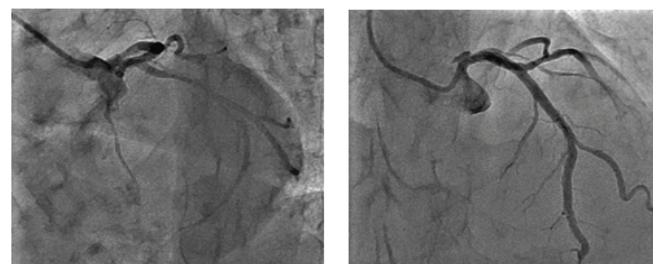


Figure 1: Diagnostic angiogram (A) LAO CAUDAL view showing haziness in the distal LM and ostial LAD, (B) AP CRANIAL projection showing dissection flap (arrow).

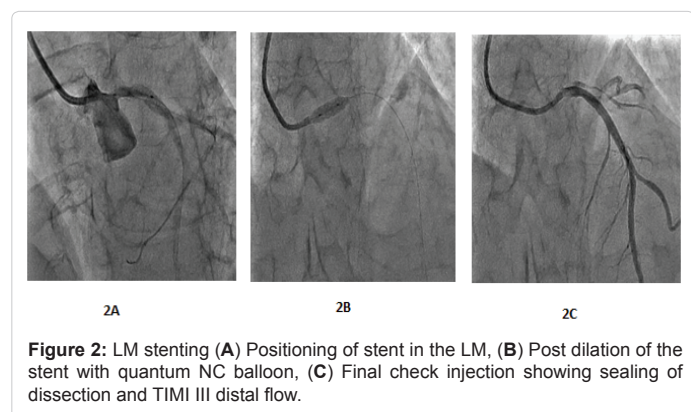
Another wire was placed in LCX as it was dominant vessel. Keeping in view the LM size, Resolute Integrity stent (4 × 14 mm, Medtronic, USA) was positioned in the LM with just covering the dissection in LAD (Figure 2A) and just hanging in aorta, inflated at 10 atm. The stent balloon was retracted a bit into the LM and stent was flared at 16atm. Post stent dilatation was done with a Quantum balloon (5 × 12 mm, Boston Scientific, USA) at 18 atm (Figure 2B). Final injection showed sealing of the dissection with Thrombolysis in Myocardial Infarction score (TIMI) III distal flow into left main and LAD (Figure 2C). The chest pain settled with resolution of ECG changes and patient remained

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stable during hospital stay. LV function was normal and subsequently patient was discharged and dual anti-platelets was prescribed. Check injection after two weeks showed a patent stent with good distal run off.

Discussion

Iatrogenic coronary artery dissection is a rare and often fatal cause of ischemic heart disease occurring predominantly in young or middle aged otherwise healthy patients [5]. It is mostly recognized at postmortem examination in young victims of sudden death [7]. Although rare, iatrogenic LM dissection is a feared complication of coronary catheterization. Its incidence, optimal therapeutic management, and prognosis remain largely unknown [8].

An intimal tear is only seldom observed. Most reports are of apparently healthy, young to middle aged patients (mean age 40 years) without overt risks for coronary artery disease and without severe coronary atherosclerosis. More than 70% of the reported cases occurred in women [7].

As per reported case in our study, patient developed chest pain, warranting urgent intervention. So bail-out angioplasty was done on table as cardiac surgery backup was not available. Revascularization therapy has been advised even in stable patients, because of very unpredictable course of disease and immediate hemodynamic collapse [9]. An intra-aortic balloon (IABP) helps to stabilize the patient and buy time in case the hemodynamics go down [10]. Treatment with the IABP is the most common form of mechanical support for the failing heart.

Deep engagement of the extra support guiding catheter and the use of hydrophilic wires were contributing factors to the LM dissection. Avoiding deep seeding of the guiding catheters (especially 7 Fr and 8 Fr sizes) may reduce the risk of LM dissection. Different strategies have been proposed for the management of LM dissection, which include conservative management if its location does not compromise coronary flow or percutaneous intervention if feasible [1].

A report by Nemanja Djenic et al., showed that LM dissection can be successfully treated with urgent in time stent implantation with good results [11]. Both, short term results of urgent stenting of iatrogenic LM dissection shown by Cheng et al., in 32 patients showing an 88.9% success rate [12]. Long term results were reported by Lee and colleagues, who showed insignificant LM restenosis during 6-month follow up on angiogram of 10 urgently treated patients, which have clear indications in favor of PTCA until and unless there is a clear indication for surgery like unfeasible coronary anatomy or >40 mm extension of dissection into aorta [5].

A drug eluting stent is preferable in the stenting of the LM interventions as supported by KOMATE [13] and COBIS II registries [14]. Primary PCI, complex interventions and LM interventions are better to be performed in a center with cardiac surgery backup setup but a study done in Taiwan, showed that even without on-site cardiac surgery backup, LM intervention can be done and especially when it's an emergency and a do or die situation with no time to open the chest especially when it can be dealt with PTCA [15].

Intra-vascular ultrasound was not used as our center was not equipped with the device, secondly the LM was post dilated with 5 mm balloon to post dilate the stent keeping in view the size of the vessel. Also, the acute situation was dealt and follow up study showed a patent stent with good distal run off.

Conclusion

Procedural complications must be avoided by proper patient selection, proper technique using best possible gadgets but if they do happen, prompt recognition and management should be done. LM dissection is a life-threatening complication but in-time PTCA to LM is a feasible and viable option rather than straight forward going to CABG even in those setups which don't have cardiac surgeon available round the clock.

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