A Challenging Case of Critical Coronary Trifurcation Disease—Managed Successfully with Percutaneous Coronary Angioplasty

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Authors’ contributions

This work was carried out in collaboration among all authors. Author SD wrote the protocol, collected data and the first draft of the manuscript. Author KM done critical revision of article and final approval of same. Authors PK, MB and ZK managed the analyses of the study and managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Coronary trifurcation lesions are a complex group of lesions. Percutaneous intervention of such trifurcation lesions which involve left anterior descending artery, left circumflex artery and RAMUS artery is difficult task. Trifurcating coronary artery disease is a complex atherosclerotic process involving the origin of one or more of three side branches arising from a main trunk. The approach to treat trifurcation lesions has not been standardized. We describe a technique to percutaneously treat this lesion using routine day-to-day hardware and a unique two guide catheter technique. We present a case admitted in our hospital with unstable angina. CAG done suggestive of triple vessel disease and later PTCA was done. Staged PTCA was planned initially RCA and subsequently Trifurcation PTCA was done for left system. No postprocedural complication was observed and then patient was discharged on third day.

Keywords: Angiography; balloon angioplasty; coronary artery disease.

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1. INTRODUCTION

Left Main coronary artery (LM) is considered to be high-risk lesion which has high chances of complications, risk ma approach nearly to 50% after percutaneous coronary intervention (PCI). Implantation of stents becomes challenging, particularly in patients with Trifurcation lesion in the LM branch due to high risk of subacute thrombosis, restenosis and side-branch damage. Management of such lesions with multiple Kissing Stent with use of kissing balloon technique (KBT) are not reported previously in literature. Here, we present a complex case of hypertensive patient with unstable Angina having a Triple vessel disease. Left Main coronary artery Trifurcation lesion-treated with a DES and kissing balloon angioplasty was done under Fluoroscopic guidance.

Coronary trifurcation lesions are a complex group of lesions and are usually more complex than bifurcation lesions when it has been treated with percutaneous coronary intervention (PCI). Such Bifurcation or trifurcation lesions is an challenging part in PCI because of higher rates of acute periprocedural complications like dissection, recurrent myocardial infarction, acute vessel closure and less effective long-term outcomes due to stent thrombosis, restenosis as compared to other treated lesions. This type of procedure usually requires multiple wires and balloons to achieve a final angiographic successful picture. It will also lead extra cost for patient. We report similar case of left Main trifurcation stenosis, treated successfully with percutaneous coronary intervention (PCI) technique.

2. CASE REPORT

We report a case of 64-year-old Indian Female patient was presented to our hospital with the complaints of chest pain left sided radiating to left sided associated with sweating and breathlessness on exertion since 1 month. He was a known case of hypertension and had no significant family history of coronary artery disease. On admission patient was hemodynamically stable with pulse rate of 84/min and BP 140/90 mm of Hg. ECG s/o T wave inversion in I aVL,V1-V6 Echocardiogram demonstrated No Regional Motion Abnormality. Family history was not significant. Angiography revealed a Triple vessel disease with Type B trifurcation disease (As per classification, Subtype B3) -90% Ostio-proximal stenosis in the left anterior descending (LAD) coronary artery with LCX showing Ostio-proximal 70% lesion and RAMUS proximal 70% lesion. RCA also showed 70% lesion in proximal segment. Staged PTCA and V2 stenting for trifurcation lesion was done.

Although coronary artery bypass grafting was strongly recommended, the patient chose not to undergo this procedure, and PCI was performed as an alternative treatment.

Right femoral arterial access taken through 7F Sheath .7F Judkins left 3.5 (JL3.5) passed via the right femoral approach. However, the 7F guiding catheter could not accommodate three balloon catheters simultaneously. Therefore, we decided to use a second guiding catheter (a 6F EBU 3.5; Medtronic) to engage the ostium of the LMCA through the patient's left Femoral Artery approach. Wire were passed through
We report these cases in which we used unique double guiding catheter technique to create a lumen of sufficient size for complex percutaneous coronary intervention. In these patient, two guiding catheters were used concurrently to engage the ostium of 1 target vessel. In this patient, one catheter were used to deliver 2 stents sequentially to their respective target lesions and another catheter was used to deliver third stent at target lesion. Similarly one catheter was used for the delivery of 2 balloons and another catheter used to deliver third balloon to complete kissing-balloon dilation after stent placement in each vessel. In this patient all the stents were deployed simultaneously as kissing stents, followed by high-pressure kissing-balloon was used for post dilation.

The procedural and post procedural outcomes were satisfactory in our patient. Patient was observed in Intensive Cardiac Care unit for 24 hrs. Heparin was given before procedure as per weight and it was continued post procedure. Hemodynamic parameters were measured. No complications noted at local site. ECG post procedure doesn't show any new changes. Patient showed symptomatic improvement after PTCA in terms of chest pain and breathlessness relief.

3. DISCUSSION

With the introduction of drug-eluting stents has greatly increased the use of percutaneous coronary intervention (PCI) for complex lesions which also have significantly improved outcomes [1-4]. A large-lumen guiding catheter is often used for complex PCI mostly, particularly when kissing-balloon dilation or multiple stent technique is required [5].

Treatment of bifurcation and trifurcation lesion is always a challenging task due to complexity and complications involved in it. In this regard, several methods have been developed till date; KBT is one of them [6]. Despite oldest, kissing balloon inflation is the most widely used method for percutaneous bifurcation interventions in current practice of invasive cardiology. It also improves the PCI outcomes by optimizing stent apposition, correcting stent deformation, and improving side branch access. Accordingly, we opted for the management of trifurcation lesion with triple Drug Eluting stent and kissing balloon inflation under fluoroscopic guidance. In our case we opine that Double guiding catheter will make stent placement easier with less complications. Similarly patient who are not willing for CABG and with persistent symptoms these can be one of the option.

4. CONCLUSION

We concluded that, Trifurcation PTCA is always a challenging task, however now a days with the use of advanced technique it has become a familiar procedure whenever needed. Double guiding catheter will facilitate the procedure with less complication and good result. In future it can be treatment option in whom CABG could not be done and if patient general condition don’t allow patient to undergo CABG procedure.
CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline patients consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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