Back to basic: A case of difficult intracoronary thrombectomy to left main bifurcation

Joyce Shek  
*Princess Margaret Hospital, Hong Kong SAR*, shekjoycesht@gmail.com

Ho-Chuen Yuen  
*Princess Margaret Hospital, Hong Kong SAR*

Ping-Tim Tsui  
*Princess Margaret Hospital, Hong Kong SAR*

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CASE REPORT

Back to Basic: A Case of Difficult Intracoronary Thrombectomy to Left Main Bifurcation

Joyce Shek*, Ho-Chuen Yuen, Ping-Tim Tsui

Department of Medicine and Geriatrics, Princess Margaret Hospital, Hong Kong SAR

Abstract

Though not recommended routinely in primary percutaneous coronary intervention (PCI), thrombus aspiration can be the gamechanger in treatment for selected patient. We report a case in which ST-segment elevation myocardial infarction (STEMI) due to a huge intracoronary saddle embolus in distal left main (LM) was successfully treated with difficult intracoronary thrombectomy. We will discuss the potential strength of different thrombectomy devices which led to the clinical success.

Keywords: ST-segment elevation myocardial infarction, Intracoronary thrombectomy, Percutaneous coronary intervention, Acute total occlusion, Embolism, Ping pong guiding

Introduction

Though not recommended routinely in primary percutaneous coronary intervention (PCI), thrombus aspiration can be the gamechanger in treatment for selected patient. We report a case in which ST-segment elevation myocardial infarction (STEMI) due to a huge intracoronary saddle embolus in distal left main (LM) was successfully treated with difficult intracoronary thrombectomy. We will discuss the potential strength of different thrombectomy devices which led to the clinical success.

Case report

The patient was an 87-year-old woman with diabetes mellitus, hypertension, atrial fibrillation (AF) on reduced dose Apixaban™ and chronic kidney disease, who presented with 2-hour onset chest pain and an electrocardiogram (ECG) showing posterior STEMI. She was in cardiogenic shock and bradycardia requiring inotrope support. Echocardiogram showed satisfactory left ventricular systolic function. She was immediately brought to the cardiac intervention centre for primary PCI. Temporary transvenous pacing was placed. Urgent coronary angiography via right femoral artery with 6Fr IL3.5 guiding showed saddle thrombus in distal LM and total thrombotic occlusion of left circumflex artery (LCX) (Figure 1). The left anterior descending artery (LAD) had a proximal thrombus with TIMI-3 flow. The rest of LAD and right coronary artery had mild disease. In view of the large thrombus, we planned direct thrombosisuction via LCX. LAD was wired with Sion Blue and ostial LCX was crossed with Fielder XTR with microcatheter support. Mechanical thrombectomy with Penumbra™ catheter via LCX was attempted. However it was met with resistance and the patient developed pulseless electrical activity arrest. Angiogram showed clot ploughing effect to LAD with reduced flow. LCX wire was removed and thrombus aspiration through LAD wire was performed with Export™ catheter. There was return of spontaneous circulation after suction. “Ping Pong” guiding technique was adopted. 7Fr EBU3.5 was inserted via left femoral artery. LCX was
wired again with Fielder XTA. Intravascular ultrasound (IVUS) to LAD showed huge ostial LCX clot protruding into distal LM and ostial LAD. There was no dissection and minimal plaque burden over LAD. Multiple passes of thrombectomy devices resulted in repeated clot dislodgement to LAD with subsequent blood pressure drop, while the thrombus reduction in ostial LCX remained angiographically insignificant.

While thrombectomy had been unsuccessful with mechanical Penumbra™ catheter and manual Export™ catheter, we considered options of simple balloonining or direct stenting. However, the attempt of balloon dilatation of ostial LCX resulted in another blood pressure drop. We finally decided to switch back to thrombosuction, but this time with the Pronto V4™ thrombus aspiration system, which has a tapered tip with side-facing opening, favouring suction of huge clots across big branches (Figure 2). This is in opposition to the previously used catheters, Penumbra™ and Export™, which have forward facing tips. We then successfully removed the ostial LCX clots with Pronto via LAD, gaining TIMI-3 flow in both vessels (Figure 3). IVUS showed no significant lesion in distal LM, ostial LAD and LCX, confirming a thromboembolic event. Thus stenting was not required.

The patient was put on single antiplatelet and oral anticoagulant, in view of her advanced age and mild anaemia. Her antithrombotic plan is Clopidogrel (75 mg daily) and reduced dose Edoxaban (30 mg daily) for one year, then lifelong oral anticoagulant. Her kidney function was preserved. We minimized contrast use by substituting angiographic guidance by frequent IVUS assessment during the PCI. She underwent cardiac rehabilitation program with good recovery. Recent echocardiogram showed good left ventricular ejection fraction.

**Discussion**

Routine aspiration thrombectomy is not recommended in primary PCI. Large randomized trials like TAPAS [1] and TASTE [2] have shown no benefits of routine aspiration thrombectomy in STEMI in improving clinical outcomes. The TOTAL trial even showed increased stroke incidence after PCI in the aspiration thrombectomy group [3]. As a result,
routine use of aspiration thrombectomy is currently a class III recommendation in the guideline from American College of Cardiology [4]. Nonetheless, thrombus aspiration remains a ‘bailout’ procedure for many cardiologists, especially for cases with high thrombus burden despite simple ballooning. Direct stenting is an alternative option to timely restore coronary blood flow. However in the presence of high thrombus burden, there is a risk of late stent malapposition and subsequent stent thrombosis. In our case, we believed that coronary embolism was the key pathophysiology of the occlusion. Patient did not need a stent after successful thrombosuction.

The use of ‘Ping Pong’ guiding catheters in our case allowed rapid sequential thrombosuction in LAD and LCX. There was snow ploughing effect after thrombosuction in LCX. Thrombus migrated to LAD and resulted in hypotension. Frequent suction via both guiding catheters could help removing clots in the left main or guiding catheter lumens. Hopefully, proximal or distal embolization of thrombus was reduced by this method.

According to existing literature, the efficacy of manual thrombectomy versus mechanical thrombectomy are comparable. There is lack of powered head to head comparisons between the two. Limited evidence suggests that mechanical thrombectomy may have higher benefits in reduction of further myocardial infarction and stroke only in patients with high thrombus burden. A study comparing vacuum pressures and forces by different catheters suggests that catheter with large opening at tip favours an ideal aspiration [5].

In our case, we initially thought mechanical thrombectomy could perform an effective clot removal for large thrombus due to its continuous suction force. However it was simple manual aspiration across bifurcation that saved the day. The ability to continuously reflect and explore possible options with an open mind is the key for a successful intervention.

Ethics information
Not applicable.

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Conflict of interest
None declared.

References