



## **Abstracts of the 10th Indonesian Society of Interventional Cardiology Annual Meeting Jakarta, 23-25 November 2018**

### **Case Reports**

#### **IVUS DID NOT PER SE IMPROVED OUTCOME OF LEFT MAIN PCI**

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#### **Introduction**

While surgery remains the standard of care, percutaneous coronary intervention (PCI) is sometimes be the only option in left main (LM) artery disease. Intravascular ultrasound (IVUS) is strongly recommended in LM PCI. This case reported the importance of IVUS usage and true understanding in LM PCI.

#### **Case**

A 54-yo female came with progressive angina CCS 3. Her risk factor was hypertension. Echocardiography revealed ejection fraction of 41% with severe hypokinesia of anterior wall. Angiography showed severe significant lesion at distal left main to proximal left anterior descending (LAD) artery; significant lesion of mid LAD and right coronary artery (RCA). Despite physician's urge, patient and husband refused for surgery and persisted for PCI. Subsequently, PCI of LM was done with IVUS guidance. IVUS revealed LM diameter of 3.8 mm with fibrotic lesion with minimal lumen area of 2.1 mm<sup>2</sup>; proximal LAD diameter of 3.6 mm. A 3.0 drug eluting stent (DES) was implanted crossover LM-LAD; postdilated with 3.5 non compliant balloon. She reported clinical improvement after PCI. Three months after LM PCI, PCI was done to the mid LAD. It revealed a patent LM-LAD stent. Six months after LM PCI, she reported progressive angina again. Angiography revealed significant in-stent restenosis of LM-LAD stent. Soon after the angiography procedure, she developed acute lung edema and was intubated. Surgery was urgently advised but refused by her husband. Subsequently, she underwent LM PCI with implantation of 4.0 DES at the left main. Soon, she got improvement and discharged at day 4. She persistently showed good clinical performance at the recent 4-month follow up.



## **Discussion**

LM PCI can be the only option particularly in the urge of patient preference. IVUS should be considered in assessing left main lesion (IIa, 2018 ESC/EACTS Guidelines). Good understanding of IVUS results should be followed by accurate implementation of LM PCI, particularly in achieving optimal stent result.

## **Conclusion**

IVUS guidance is strongly recommended in LM PCI. Its usage does not per se improve PCI outcome; indeed, good understanding and subsequent application in PCI is the key for the better result.

Keywords: Left main PCI, IVUS

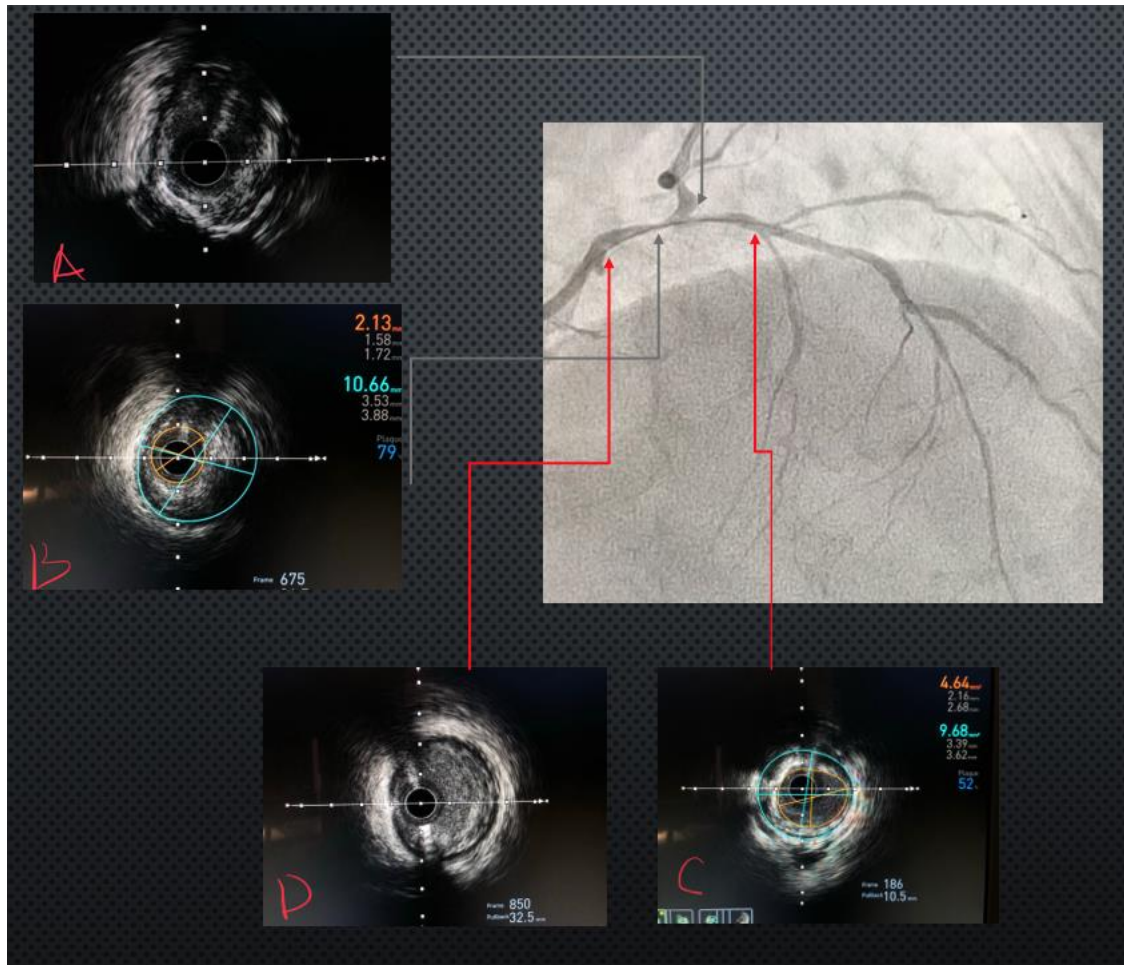


Figure 1. Intravascular ultrasound of left main - left anterior descending artery



## **A CHALLENGING CASE OF DISLODGED STENT FLOATING IN LEFT MAIN ARTERY RETRIEVAL WITH THE USE OF SNARE KIT**

A 64-year-old man, with recent onset effort angina was taken for percutaneous coronary intervention for significant left main and proximal left anterior descending artery (LAD) stenosis. During procedure, after PCI the left main and LAD, there was resistance to advance the stent across the lesion in LCX. When the stent was withdrawn to re-dilate the lesion, it dislodged from the balloon catheter completely and was floating over from left main coronary artery to aorta. This case demonstrates how to prevent and manage stent dislodgement.

## COMPLICATION OF IATROGENIC DISSECTION DURING CHRONIC TOTAL OCCLUSION INTERVENTION OF RIGHT CORONARY ARTERY

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**Introduction :** Iatrogenic coronary dissection is rare case but related with a potential risk of acute impairment of coronary blood flow which results in devastating complication of percutaneous coronary intervention (PCI). Its incidence has been reported 0.06% of the interventional coronary or diagnostic procedures, 0.25% of whole PCIs in recent reports. When a guiding catheter is engaged into the coronary artery, an inappropriate maneuver is likely to evoke the dissection in the ostium of the right coronary artery or the left main. Chronic total occlusions (CTOs) are encountered in approximately 20 % of patients referred for coronary angiography. When performing percutaneous coronary intervention (PCI), incomplete revascularization is associated with an adverse impact on long term mortality.

Keywords : CTO, Iatrogenic dissection

### Case Presentation :

We present a case of a 57 years old Asian male with progressive angina, he was referred to our hospital for CTO-PCI of the proximal-mid right coronary artery (RCA). He had history of PCI in the left coronary artery (LCA) and was on dual antiplatelet therapy on admission. After introducing a 6 Fr sheath on the right radial artery, an antegrade approach of the occluded RCA was performed, A 6 Fr guiding catheter (GC) (Amplatzer left 1) was engaged to the RCA. We confirmed that GC was engaged appropriately by initial test shot, and then confirmed no serious problem. Coronary angiography (CAG) showed no in-stent restenosis at left anterior descending (LAD) artery and there were multiple lesion proximal until distal RCA (CTO at mid part of RCA) and distal RCA from ipsilateral and contralateral flow. However, We could not wiring Sion Blue through ostial of RCA, with initial test shot was showed dissection at ostial RCA. We replaced GC with JR 3.5/6F and escalation wire Sion Blue and Fielder XT-A with Microcatheter Finecross MG 1.8Fr/150 cm to crossed the lesion. Fielder XT-A could not cross until distal RCA, hence we decided to implant stent Promus Element Plus 2.75/12 mm at ostial RCA and we replaced GC with AL1/6F. Finally, we could cross the lesion with Fielder XT-A and backup microcatheter Finecross and replaced the wire with Sion Blue. We did predilatation with Sapphire balloon 1.0/15 mm and Sapphire Balloon 2.0/18 mm, then implanted Stent Promus Element Plus 2.5/38 mm and Promus Element Plus 2.75/32 mm distal until previous stent at Proximal RCA. Post dilatation with non compliant (NC) Sapphire balloon 3.0/18 mm. We decided that the additional stenting was

necessary at ostial RCA with Promus Element Plus 3.0/16 mm because of cramping stent at ostial part.

### Discussion :

Iatrogenic coronary dissection induced by guiding catheter insertion into RCA may lead to difficulty to cross wire, catastrophic hemodynamic loss and myocardial infarction. Iatrogenic coronary dissection was likely to occur in patients with older age, diabetes mellitus, hypertension and high degree of atherosclerosis. In the present case, the dissection occurred regarding of bad engaged and maneuver, we should not inject the contrast media to avoid the progression of dissected lumen. The second problem occurred because of weak backup of GC, we had to implant stent at ostial RCA and change GC with a preferable backup for CTO intervention.



Figure 1. Diagnostic Coronary angiogram



## SUCCESSFUL MANAGEMENT OF STENT DISLODGE USING BALLOON ENTRAPMENT RETRIEVAL TECHNIQUE DURING MINI CRUSHED IN LEFT BIFURCATION STENTING

Jusup E

### Abstract

Coronary bifurcations stenting remain one of the most fascinating and challenging lesion subsets in interventional cardiology, percutaneous coronary intervention (PCI) is increasingly employed in the treatment of patients with coronary bifurcation disease. Stent dislodge is an uncommon complication but challenging complication during complex PCI which can lead into coronary thrombosis unless it is treated appropriately. We report a rare case of successful stent dislodge retrieval with balloon entrapment retrieval technique.

### Keywords

Complication, coronary bifurcation stenting, balloon entrapment retrieval technique, complex PCI

### Introduction

Coronary stent dislodgement continues to occur in this modern era of PCI though the incidence is decreasing. It is often associated with significant morbidity, including coronary thrombosis, myocardial infarction, emerging coronary artery bypass graft surgeries, and even death.

Stent dislodge was associated with heavy vessel calcification, vessel tortuosity, and diffuse disease. There was several technique in percutaneous approach had been published such as snare, and wire. To our knowledge, this is the first case report of successful retrieval of stent dislodge with balloon inflated retrieval technique.

### Case Report

A 63-years old male was admitted to our cardiology outpatient department with Canadian Cardiac Society Class II stable angina pectoris with the history of myocardial infarction. His coronary risk factor were hypertension, diabetes mellitus, hyperlipidemia and ex-smoker. Diagnostic coronary angiography showed 90% stenosis of distal LM stenosis MEDINA 1-1-1, 95% stenosis from ostial to proximal left anterior descenden artery (LAD) and 95% stenosis from ostial to proximal left circumflex. (figure 1).



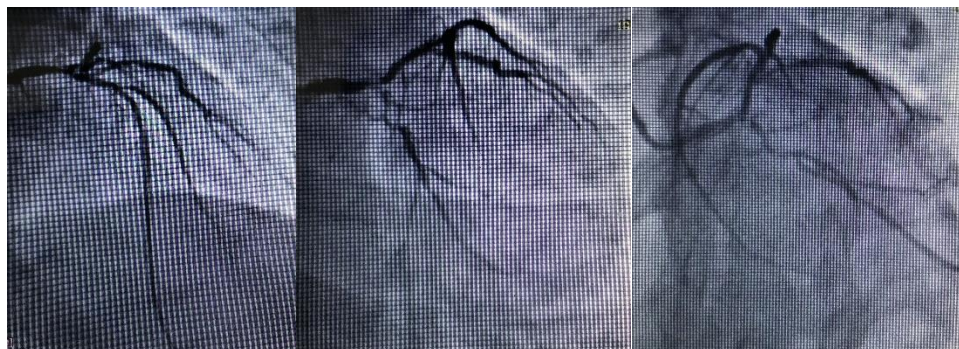


Figure 1. LM bifurcation disease

Afterwards, percutaneous coronary intervention (PCI) to LM bifurcation lesion was planned. We decided to do a mini crushed technique using 2 stent strategy. LM, LAD and LCx was predilated with a 2.0/20mm compliance balloon with the maximum pressure were 16atm. Then we deliver a DES 2.5/24mm to LCX, but the stent was stuck in the LM-LCx area (figure 2a) while the wire still in the dislodge stent lumen, then we deliver a 1.0/10mm balloon to the distal of the stent. The balloon was inflated after passing the dislodge stent and pull back softly into the guiding catheter (GC). Once part of the stent already in the GC, then we deliver a 2.0/20mm compliance balloon and inflate it with 16 atm to entrap the dislodge stent in GC and pull back the whole system out. (figure 2b).



Figure 2 a. Stent dislodge in LM-LCx, b. Balloon entrapment retrieve the dislodge stent out

After we retrieve the stent dislodge out, we start all over again to do a mini crushed with 2 stent strategy for the LM bifurcation lesion.

## Discussion

Stent dislodge in the coronary arteries is rarely seen but may be complex to handle. The incidence of these complication is approximately 0.9- 8.3 % . factor that can increase the chances of stent dislodge from the balloon catheter within a coronary artery can include tortuosity, calcification and passage through a previous stent. {Brilakis, 2005 #1} Since the dislodge stent is thrombogenic and its presence inside the coronary, this makes the fragment removal is essential to minimize this



risk and retrieval is strongly suggested over crushing. Surgery and different percutaneous techniques can be used for removing this dislodge stent.

### Conclusion

This case shows that percutaneous balloon entrapment technique can be a safe and effective first option in management of dislodged and unexpanded stent in the left main coronary artery.

## **PERCUTANEOUS SINGLE ACCESS TRANSRADIAL PERIMEMBRANOUS VENTRICULAR SEPTAL DEFECT CLOSURE USING ADO II; A CASE REPORT**

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Transcatheter closure of peri membranous ventricular septal defects (pmVSDs) has developed into a well-established procedure. This procedure commonly uses dual access from femoral vein to load the device and femoral artery to capture the guide wire. Amplatzer Ductal Occluder (ADO) II (St. Jude Medical, St. Paul, Minnesota, USA) is symmetrically device that can be used for closing pmVSDs, either from right or left ventricular site. Therefore, transradial approach may be used as an alternative traditional femoral access. This approach has potential advantages to reduce procedural complications and shorten hospital stay. In this report we describe percutaneous single access transradial pmVSD closure using ADO II in young adult patient.

### Case

A 31-year-old male with a pmVSD was referred to our hospital for percutaneous closure. A transthoracic echocardiogram revealed an aneurysmal of pmVSD with left to right shunt. The defect size was 4.5 mm and a peak left to right gradient of 75 mmHg across the defect. Defect was 6 mm away from aortic valve and septal length was 6 mm. There was no evidence of aortic valve prolapse, aortic regurgitation. The LV systolic function was normal. The anatomy of the defect appeared suitable for device closure. We decided to attempt the closure through transradial route using ADO-II. Right radial arterial access was achieved using a 6 French hydrophilic coated sheet. Procedure was monitored under transthoracic echocardiography. We used a 6F internal mammary guiding catheter (IMGC) Vistabrite tip (Cordis, Miami lakes, Florida, USA) and a 0.035-inch angulated hydrophilic guidewire Radifocus (Terumo, Shibuya, Tokyo, Japan). The wire was parked in superior vena cava. IMGC was used as the delivery catheter. The GC was then advanced over the wire into the right ventricle. Under angiographic and trans-esophageal echocardiography (TEE) guidance, a 9-PDA2-06-04 ADO II was deployed through IMGC at the pmVSD. TEE showed excellent result with no encroachment on the aortic valve, no aortic regurgitation and no residual left to right shunting. A vigorous “tug test” was performed. The device was stable and hence was released. No heart block or conduction disturbances were noted.

The patient was discharged home the next day. On 1 month follow-up, the patient went well without any symptoms.

Conclusion: transradial percutaneous closure of pmVSD is visible, safe and effective.



## **TREATED ELLIS TYPE II CORONARY ARTERY PERFORATION USING KNOTTED GUIDEWIRE TIP**

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**Abstract** Coronary artery perforation (CAP) is a rare complication of percutaneous coronary intervention. CAP was classified according to Ellis criteria as type I (extraluminal crater), II (myocardial or pericardial blushing), and III (contrast streaming or cavity spilling). Types I and II are caused by stiff or hydrophilic guidewires while type III are caused by balloons, stents, or other intracoronary devices. Most of the reports treated Ellis type II perforation conservatively or using prolonged balloon dilatation. We have successfully performed a temporarily seal in a patient with Ellis type II perforation using knot of soft guidewire tip at distal RCA with a good result and the procedure continued without further complication.

### **References**

1. Shimony A, Zahger D, Van Straten M, et al. Incidence, Risk factors, Management, and Outcomes of Coronary Artery Perforation During Percutaneous Coronary Intervention. *Am J Cardiol.* 2009;104:1674-7.
2. Al-Mukhaini M, Panduranga P, Barkat Riyami M, et al. Coronary Perforation and Covered Stents : An Update and Review. *Heart Views*, 2011 Apr-Jun; 12(2): 63-70.

## MYOCARDIAL INJURY INDUCED BY INTRAPROCEDURAL THROMBOTIC EVENT AT THE RIGHT CORONARY ARTERY DURING ELECTIVE PERCUTANEOUS CORONARY INTERVENTION

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**Background:** Intraprocedural Thrombotic Event (IPTE) is one of the rare complication of Percutaneous Coronary Intervention (PCI) especially during elective procedure. IPTE is defined as the formation of new thrombus or increased size of thrombus, abrupt closure of blood vessels, occurrence of slow flow or no reflow, or distal embolization that occurs during percutaneous intervention procedures. IPTE is associated with a risk of cardiovascular adverse events such as death, myocardial infarction, unplanned revascularization and major bleeding.

**Case Illustration:** A 66-year-old man with diagnosis of CAD / 2VD, post DES implantation at proximal to distal LAD, chronic stable angina CCS class II and controlled hypertension, was admitted at Sanglah Hospital for elective PCI at the Right Coronary Artery (RCA). Coronary angiogram revealed 80-90% stenosis at proximal RCA. During wiring of the RCA using guidewire across the stenotic lesion, vasoconstriction occurred at the distal part with formation of thrombus from proximal to distal. Patient complained of chest discomfort, and ECG showed ST elevation at the inferior lead. Medication such as isosorbid dinitrate, GP IIb/IIIa inhibitor, and heparin were administered immediately via intracoronary route. Direct stenting technique was performed with DES at proximal to mid RCA and showed TIMI 3 flow at RCA. Chest pain resolved with ECG showing normalization of ST segment without any increase of cardiac markers and hence concluded as myocardial injury.

**Conclusion:** This case illustrates a rare complication of IPTE during elective PCI procedures. The success of handling in this case is largely determined by the rapid and appropriate medical treatment and the proper stenting technique to prevent further complications of IPTE.

**Keywords:** IPTE, Elective PCI, RCA, medication, direct stenting, myocardial injury.

## BIFURCATION LESIONS ONE OR TWO STENT STRATEGY?

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### ABSTRACT

#### Introduction :

Coronary bifurcations lesion are frequent and account for approximately 20% of all percutaneous coronary interventions. Coronary bifurcation stenting is still a complex procedure and associated with lower procedural succes rate and also high risk of long term outcomes such as Major Cardiac Events (MACEs), Target Lesion Revascularizations (TLRs), stent thromboses and restenoses. Various techniques with usage of one or two stents have been developed to optimize treatments of this subset of lesions. One stent strategy with provisional side branch stenting should be the default approach in the majority of cases due to lower risk of failure and complications. Some studies reported that 5-20% of patients in which the provisional one stent strategy was performed requiring crossover of two stents strategy due to suboptimal result of side branch. In this case report, two cases were shown to be discussed of how to decide between interventional strategy of bifurcation lesions using one stent strategy, two stents strategy, and one stent strategy in which we encountered some problems that we resolved with crossing over to two stent strategy.

#### Case Illustration :

##### Case 1.

A 56-year old male presented with typical angina with the history of acute myocardial infarction 2 days before admission. Electrocardiogram evaluation showed anterior old myocardial infarction with evolution of ST segment. He underwent coronary angiography with 80% stenoses (1-1-1 type) of Medina classification at Left Circumflex (LCx) and Obtus Marginal (OM) 1 bifurcation. Provisional stenting based on angiogram profile were used. Drug Eluting Stent (DES) with 3.0 on diameter and 24 mm on length of stent were deployed at the vascular lesion. Stent was displaced to distal side of the vessel when the stent was inflated and plaque at the lesion shifted to proximal part of bifurcation core and ostial of OM1. Crossover strategy with cullote technique were opted.

##### Case 2.

A 58-year old male were presented with acute myocardial infarction since 7 hours before admission. Electrocardiogram evaluation showed ST segmen elevation at inferior leads. Primary PCI was executed. Coronary angiogram showed long stenosis 60% at the proximal side of Left Anterior Descending (LAD), significant stenosis at OM2 bifurcation with 1-0-1 Medina classification, and nonsignificant stenosis at proximal Right Coronary Artery (RCA) with non dominant circulation. LCx was the infarct related artery and the bifurcation lesion at LCx and OM2 were planned to be intervened. Provisional stenting technique based on angiogram profile was



used. Drug Eluting Stent (DES) with 2.4 on diameter and 24 mm on length of the stent were implanted at the lesion. Because of long lesion and slower flow of the side branch, crossover strategy with internal crush technique were chosen to overcome limitations of provisional stenting. These two case showed that two stent strategy was performed due to suboptimal result of provisional stenting. Some studies reported that this crossover usually occurred due to suboptimal result in a side branch including side branch dissection, shifting plaque, slow flow, or FFR <0.75. The decision to use one stent strategy or two stent strategy is the most important thing for the management of bifurcation lesion. Main vessel stenting with provisional side branch treatment is recommended as the preferred technique for the majority of bifurcation lesion due to no significant differences in outcome compare with two stent strategy and lower periprocedural duration. Two stent strategy must be planned in bifurcation lesion with true bifurcation especially Medina Classification 1-1-1, large diameter of side branch (>2,5 mm) and long lesion of side branch beyond the ostium (>10-20 mm).

**Conclusion :**

Coronary bifurcation remains a challenging lesion subset of percutaneous coronary intervention. The provisional approach, with main branch stenting only, is the more preferred strategy for the bifurcation lesion. However, there were a lot of incidences of crossing over to two stent strategy due to suboptimal side branch result. Initial two stent strategy was preferred in patients with true bifurcation, large side branch and non-focal ostial plaque disease of side branch.

**Keywords :**

Bifurcation Lesion, Provisional Strategy, Two Stent Strategy

## **EYES ON THE LESIONS: IN-STENT RESTENOSIS AFTER PREVIOUS COMPLEX PCI**

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### **Background**

Intravascular ultrasound (IVUS) is a valuable tool to see coronary arteries inside-out. IVUS cross-section view aid in lesion evaluation, stent sizing, and optimal stent placing confirmation. In bifurcation lesion, it is exceptionally useful to evaluate the lesion, stent and shifting plaque which can cause flow deterioration (snow-plow effect).

### **Objective**

To learn IVUS usefulness in determining etiology and management of in-stent restenosis (ISR)

### **Case description**

A 50 years old overweight, hypertensive and poorly controlled diabetic male with atypical chest pain. He had prior myocardial infarction in 2015 and was done primary PCI in RCA. Complete revascularization done in 2016 with PCI LM-LAD (cross-over technique). Less than 2 years, patient felt chest pain, angiography showed new lesion in ostial LCX, stent was placed with Culotte technique. One year later, another chest pain, angiography showed subtotal ISR LCX and 70% ISR LAD, significant stenosis ostial D1 and patent stent RCA. Lesion was prepped with balloon dilatation. IVUS showed ISR LAD minimum stent area (MSA) 4.1 mm<sup>2</sup> and ISR LCX MSA 4.2 mm<sup>2</sup>, both underexpansion. Drug-eluting stent was deployed in LAD and high-pressured post-stenting dilatation with non-compliance balloon was done. Bigger balloon was used to treat ISR in LCX. Kissing balloon dilatation was done at bifurcation. IVUS and angiography displayed shifting plaque to LAD which then dilated with high-pressured non-compliance balloon. Re-evaluation revealed the plaque shifted to LCX and were also dilated. IVUS showed LCX MSA 6.5 mm<sup>2</sup> and LAD MSA 8.1 mm<sup>2</sup>. Final result, no residual stenosis, TIMI 2 flow managed with intracoronary nitroglycerin 100 mcg, MBG 3.

### **Conclusion**

We have reported a case of in-stent restenosis due to underexpansion which proven by IVUS and managed by expanding with bigger balloon.



**ASSISTED ANCHOR BALLOON TECHNIQUE:  
A USEFUL MANEUVER TO ACHIEVED ADEQUATE GUIDING SUPPORT  
IN LEFT-SIDED ANOMALY ORIGIN OF THE RIGHT CORONARY ARTERY  
DURING PRIMARY PERCUTANEOUS CORONARY INTERVENTION**

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**Introduction:** The incidence of coronary artery anomalies (CAA) ranges from 0.2% to 5.6% in various studies. Anomalous aortic origin of a coronary artery is a relatively common coronary anomaly of which anomalous origin of right coronary artery (RCA) is more frequent. In particular, ST-segment elevation MI (STEMI) is a rare clinical presentation in patients with coronary artery anomalies. As suggested by current guidelines, all patients presenting with STEMI should receive reperfusion therapy, either with thrombolysis or primary percutaneous coronary intervention (PPCI). Percutaneous coronary intervention of an anomalous RCA from the left sinus of Valsalva is technically challenging as the anomalous origin impedes coaxial arrangement of guiding catheter and there is a lack of adequate backup support for the guiding catheter. This review therefore discusses a technique for PPCI of an anomalous RCA in which we used an anchor balloon to successfully engages the guiding catheter and cannulate the RCA.

**Case:** A 62-year-old man came to the emergency room with chief complain chest pain since 7 hours before admission. Haemodynamic was stable with blood pressure 120/80 mmHg and no rales from lung examination. ECG showed sinus rhythm with elevation of ST-segment in lead II, III and aVF (inferior STEMI). The patient was taken for PPCI through the right radial approach. The LCA was cannulated using a 5F Optitorque diagnostic catheter which showed significant stenosis in left anterior descendent and circumflex artery. Inadvertently when we cannulated to the LCA, it appeared that the RCA ostium was located close to the LCA ostium and showed total occlusion in proximal of RCA (as culprit lesion). Hence, it was decided to go ahead with an angioplasty of RCA. We cannulated the RCA with 6F JL 3.5 guide catheter and found difficulty to engages the RCA. Adequate cannulation and back up support was achieved with assisted anchor balloon technique of the guide catheter (by insert a wire and 2.0 mm × 15 mm balloon was passed distally in the RCA and dilated to 8 atm). Once cannulated, the lesion was predilated using the same balloon at 12 atm. Finally, RCA was stented in the mid part using 3.0 mm × 38 mm Xience Pro drug-eluting stent at 10 atm and proximally using a 3.5 mm × 23 mm Xience Pro drug-eluting stent at 12 atm. Final result showed a TIMI 3 flow. There was no dissection, thrombus, or any other periprocedural complication.

**Conclusion:** This report presents a case of inferior STEMI with anomalous origin of RCA who underwent successful PPCI with assisted anchor balloon technique.

## PRIMARY PCI TO BIFURCATION LESIONS : WHEN DO WE NEED A PREPARATION FOR THE SIDE BRANCH?

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### Abstract

**Introduction :** Coronary reperfusion with Primary Percutaneous Coronary Intervention (PCI) improve outcomes in patients with ST elevation myocardial infarction (STEMI). PCI in bifurcation lesions remains a challenging frontier in interventional cardiology. It is not uncommon to encounter bifurcation culprit lesions in the setting of STEMI. Attention is needed to observe whether we need a preparation for side branch before stent implantation. This abstract aimed to discuss a case about how to handle primary PCI in STEMI with bifurcation lesions, focusing on preparation for the side branch.

### Case Illustration :

A 57-year-old male presented with typical chest pain since 4 hours before hospital admission, with 8-9 visual analogue scale. His risk factors were hypertension and smoker. From the examination, blood pressure was 170/100 mmHg, HR was 75x / minute and the ECG revealed ST elevation at V1-V6. Then patient underwent Primary PCI. Coroangiogram showed LM : normal, LAD : subtotal proximal occlusion, ostial stenosis D1, LCx : Normal, RCA : 70% proximal stenosis, 70% mid stenosis. We decided to intervene LAD as the infarct related artery. Cannulation was carried out by guiding EBU 3,5 / 6F, wiring with floppy 0.014" to distal LAD, predilated with Semi Compliant Ballon 2.75 / 20 mm then inflated at 8-13 atm. Second wiring with floppy 0.014" to distal D1. Stenting with DES 3.0 / 24 mm in proximal LAD and was inflated at 12 atm. An angiographic evaluation showed that D1 was no reflow. Then we continued rewiring from LAD to D1 but failed to pass through the lesion D1. We performed dilatation with Non Compliant ballon 3.0 / 12 mm balloon intra stents at 12 atm. Rewiring from LAD to D1 was still unsuccessful. Angiography evaluation found no residual stenosis, dissection nor thrombosis. TIMI flow was 3 in LAD, while in D1 was 1. Theoretically, bifurcation stenting technique may not favorable because it needs longer procedure time and larger contrast enhancement, especially in patients who

underwent primary PCI. In this case, poor preparations on the large diameter of side branch resulted in side branch occlusion. One thing to accomplish with bifurcation lesions is optimal angiographic views. The three-dimensional angle of bifurcation must be viewed carefully from various views, so it can describe the diameter of the side branch, ostial lesion of the side branch, length of side branch lesion, and angle of angulation of the side branch. Then we can determine the next step whether we need preparation of the side branch or not. In this case, when we finished diagnostic angiography, the bifurcation lesions were not depicted clearly enough, so provisional stenting were planned. After the first wiring and dilatation of Main branch (LAD), it was seen an ostial occlusion of D1 as a side branch, so the side branch was protected with side wiring. Angiography was not well enough in showing the picture of bifurcation anatomy. As if there were no problems with the side branch, we only did wiring on side branches without predilatation. Finally, after we implanted the stent in main branch (LAD) there was a sudden side branch occlusion. Predilatation on the large side branch before stenting on the main branch was important. There were many system values for predicting occurrences of occlusion in side branches, such as easy five variables that from their study affect the bifurcation procedure outcome (smoking, hypercholesterolemia, Medina 1.1.1, Side branch TIMI flow before intervention and the extent of the plaque more than 5 mm inside the Side branch) and may be considered as high risk factors for Side Branch troubles and impairment. We ought to calculate this score to assess the risk of occlusion on the side branch whether administering wire and predilatation are needed on the side of the branch or not.

**Conclusion:** Side branch lesion has to be a concern when doing Primary PCI in bifurcation lesions. An optimal comprehensive angiographic view is first key to have a success bifurcation stenting. Then, predicting the occurrence of side branch occlusion to prepare side branch better. The last key is determining whether side branch need a stent implantation or not.

Keyword : Primary Percutaneous Coronary Intervention, STEMI, Bifurcation lesions, side branch.

## BIFURCATION INTERVENTION AT THE ANOMALOUS ORIGIN OF THE RIGHT CORONARY ARTERY FROM THE MIDPORTION OF LEFT ANTERIOR DESCENDING ARTERY

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### Introduction :

The anomalous origin of the right coronary (RCA) as a branch from the left anterior descending artery (LAD) is a very rare variation of the single coronary artery anomaly. The incidence of coronary artery anomalies detected during coronary angiography is about 1.3% in the largest report series. Among these coronary anomalies, the single coronary artery is a rare anomaly in which one coronary stems from a single coronary ostium from the aortic sinuses. A subtype of this anomaly is the origin of the right coronary artery (RCA) from the portion of the left coronary system (with incidence of 0.009%). We here introduce a patient with a bifurcation lesion at midportion of LAD and ostial of the origin of the RCA.

Keywords : Congenital abnormalities, bifurcation intervention

### Case Presentation :

We present a case of a 71 years old male with history of chest discomfort, he was referred to our hospital for angiography after hospitalized because of acute coronary syndrome. He had history of stroke, hypertension and diabetes mellitus. Electrocardiography shown normal sinus rhythm and the echocardiography result was normal. He was undergone Percutaneous coronary intervention (PCI) at proximal and distal LAD intervention 2 month before. After introducing a 7 Fr sheath on the right femoral artery, A 7 Fr BL guiding catheter was engaged to the left main coronary artery. Coronary angiography (CAG) showed calcified, no in-stent restenosis at left anterior descending (LAD) artery and there were significant lesion at mid-portion of LAD and ostial of the origin of RCA, there was also lesion at mid RCA. We performed wiring with Runthrough NS to distal RCA and to distal LAD, pre-dilatation with Fluydo 2.0/20 mm balloon and then stenting DES 2.75/20 mm at mid RCA. Then, we did Predilatation at bifurcation lesion with Fluydo 2.0/20 mm balloon and implantation of DES 3.0/20 mm at LAD-RCA. After that, we recrossed Runthrough NS to distal LAD because of jailed wire and did predilatation with Sapphire balloon 1.0/10 mm and Fluydo 2.0/20 mm in order to open the struts stent, then implanted DES 3.0/16 mm at LAD, overlapped with previous stent. Finally, we recrossed to RCA, performed pre-dilatation with Sapphire balloon 1.0/10 mm and Fluydo 2.0/20 mm, then Post dilatation with NC Sapphire balloon 3.0/20 mm, kissing balloon NC Sapphire balloon 3.0/12 mm and NC Sapphire 3.5/12 mm. We finished the procedure with proximal optimization technique (POT). After 6-

month period, coronary angiogram evaluation showed patent stent and it was considered excellent result.

### Discussion :

The anomalous origin of the RCA from the LAD is rare coronary anomaly in which the anomalous RCA arises from mid portion of the LAD and in majority of cases, passes anterior to the pulmonary artery before reaching the right atrioventricular groove. We performed PCI with Culotte stenting technique and final POT procedure.



Figure 1. Diagnostic Coronary angiogram

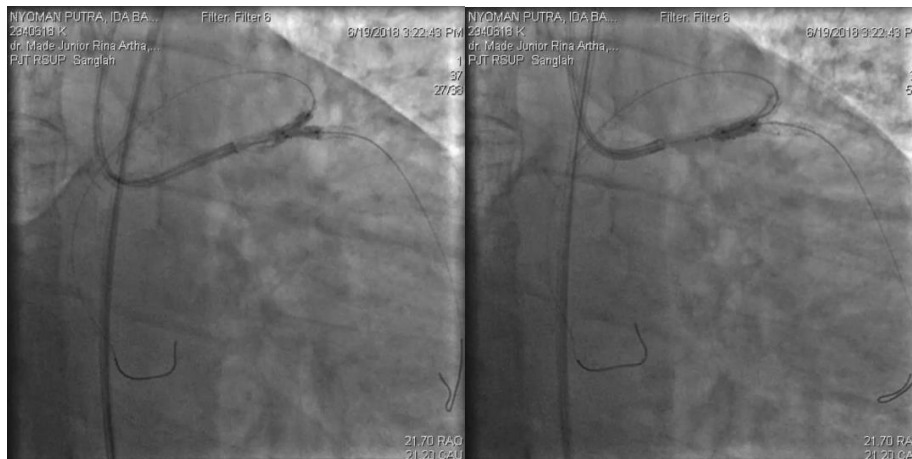


Figure 2. Culotte stenting, kissing balloon and POT procedure.



Figure 3. Final Results angiogram

## A CASE SERIES OF CORONARY ARTERY PERFORATION FOLLOWING ADJUVANT BALLOON POSTDILATATION RESCUED BY HEPARIN REVERSAL AND PROLONGED BALLOON INFLATION

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**Background:** Coronary artery perforation (CAP) has been one of the most life-threatening complication in contemporary percutaneous intervention (PCI). The imminent lethal outcome of CAP is hemodynamic compromise from ensuing cardiac tamponade. Some emergency measures must be taken sequentially before the diagnosis of coronary perforation during PCI. We report two unexpected coronary perforation just after balloon inflation and adjuvant balloon postdilatation at the stented area, which were successfully rescued after partial heparin reversal and prolonged balloon inflation at low pressure. The aim of this case report is to discuss the management of CAP in patients undergoing PCI.

### Case Illustration:

Case 1 : 66 year-old male was presented with stable angina pectoris with prior acute coronary event and stent implantation in LAD. The angiography showed 90% stenosis in proximal LCx, 70% stenosis in distal LM, 80% stenosis in ostial-proximal LAD, 60-70% stenosis in proximal intermediate branch and 50% stenosis in distal RCA. PCI was then performed on him with placement of DES in proximal LCx and ostial-proximal LAD. CAP was confirmed on angiography after adjuvant balloon postdilatation. We then administered 25 mg of Protamine Sulphate IV and performed prolonged balloon inflation. After several attempt there was no leakage identified by angiography. Patient was then sent to the ICVCU to be closely monitored. After 48 hours the patient was clinically stable with only minimal pericardial effusion. The patient then moved to the ward and discharged the next day.

Case 2 : 44 year-old male admitted from the outpatient clinic with continued angina d'effort after history of ACS. He was then sent to the catheterization lab and diagnostic coronary angiography was then performed. CTO in proximal RCA was identified during the procedure. Wiring and ballooning of the lesion was attempted on him. Angiography to confirm the coronary track was performed and CAP was confirmed despite only slight flow identified. 25 mg of IV Protamine Sulphate was administered along with prolonged balloon inflation at low pressure. The leakage stopped soon after and the patient was sent to ICVCU for further monitoring. After 24 hours, there was only minimal pericardial effusion found from subsequent bedside echocardiography and the patient was clinically stable. He was then moved to the ward and discharged the next day.

**Discussion:** CAP is a severe and dramatic complication of PCI causing imminent lethal outcome of haemodynamic compromise from ensuing cardiac tamponade. The probable cause in these cases are dilatation at high pressure that reached a high balloon-artery ratio, and CTO with heavily



calcified lesion especially in the second case. The prolonged inflation time of the containment balloon had a determinant role in the perforation control, and there was no need for coated stent implantation in these cases.

**Conclusion:** CAP is one of the most dreaded iatrogenic complications during PCI. Despite several methods known about the management of CAP, there is still insufficient data available concerning the prognosis and management of it. Heparin reversal and prolonged balloon inflation were successfully rescued the patients we treated from devastating cardiac tamponade. Quick and careful decision about what procedure to take should be made whenever iatrogenic complication occur during PCI.

**Keyword:** Coronary artery perforation, percutaneous coronary intervention, prolonged balloon inflation



## FIGHT THE STUBBORN THROMBUS : A CASE REPORT

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**Background:** Thrombus burden in ST-elevation myocardial infarction (STEMI) can be highly variable. The presence of high-grade thrombus (TIMI thrombus grade 4-5) is associated with worse outcomes, including lower procedural success, consequence of distal embolization, slow or no re-flow. Thus, appropriate management is an essential prerequisite for successful PCI. The aim of this article is to present a challenging case of high-grade thrombus in STEMI and its management.

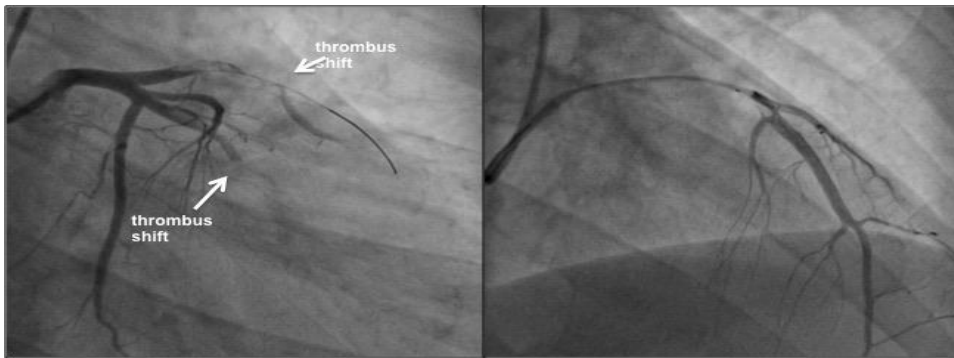
**Case Presentation:** A 35-year old male presented to our ED complained severe chest pain since 3 days ago. ECG showed ST-elevation in lead V1-V6, and he was diagnosed as late-onset anterior STEMI. Due to persistent chest pain, diagnostic coronary angiography was performed and revealed total occlusion by thrombus in proximal LAD (figure 1).

**Results:** An early PCI was a preferred strategy. After wiring to the distal LAD, multiple balloons pre-dilation had been done to resolve the thrombus but it failed, and fluoroscopy showed thrombus shift into diagonal branch and left circumflex artery with TIMI flow 0 distally. Thrombo-suction was used to aspirate the thrombus and to evaluate distal vessel. (Figure 2) The culprit lesion was stented with long drug eluting stent (DES 3.5/38) and after stent deployment, there's an evidence of slow-reflow (TIMI flow 2) and it still showed thrombus in left circumflex and diagonal branch (figure 3). Administration of Eptifibatide intracoronary was used to manage this condition. Further, the patient was discharged after 3 days and at 3 months follow-up, he had no complained with LVEF 45% and coronary angiography evaluation showed patency of LAD stent with TIMI 3 flow and stenosis in left circumflex artery (figure 4).

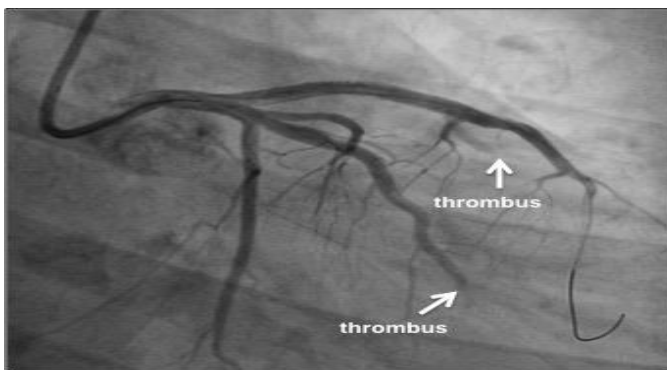
**Conclusion:** Thrombus burden in STEMI poses a unique series of challenges, and its management continues to remain a therapeutic challenge. Combination of both pharmacological and mechanical therapies can be useful to achieve the best outcomes.



**Figure 1.** Coronary angiography revealed normal RCA (left), and total occlusion in proximal LAD (right)



**Figure 2.** After multiple balloons pre-dilation, there was thrombus shift into diagonal and left circumflex artery (left) and thrombosuction was used to aspirate thrombus and evaluate distal vessel (right).



**Figure 3.** After stent deployment, fluoroscopy showed slow-reflow in LAD and thrombus in left circumflex artery and diagonal branch.



**Figure 4.** Coronary angiography evaluation at 3-mo after early PCI showed stenosis in left circumflex artery (arrow) and stent in LAD was patent with TIMI 3 flow (right).

## **“HAIRPIN” WIRE TECHNIQUE TO NEGOTIATE OF BIFURCATION LESION INTERVENTION WITH A UNIQUE PLAQUE : A CASE REPORT**

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### **ABSTRACT**

**BACKGROUND.** To advance a wire across the lesion and position the tip distally on a timely basis is a great challenge during any interventional procedure, especially in bifurcation lesion with the specific shape of the plaque. In rare instances, it could be difficult to steering and advancing a wire through severely acutely angulated of the branch with certain critical stenosis.

**CASE ILLUSTRATION and DISCUSSION.** A 55-year-old female patient with a history of CAD 6 month prior, presented with recurrent stable angina (CCS II) despite of optimal management. Diagnostic angiography showed a bifurcation lesion (Medina 1-1-0) at the mid-distal left circumflex coronary arteries (LCX) as main branch (MB) and obtuse marginal1 (OM1) as a side branch (SB); significant stenosis in left anterior descending artery and patent right coronary artery. She was referred for elective PCI of the LCX and LAD lesion. We initially attempted to cross the bifurcation lesion the LCX-OM1 at MB using usually wires several times but failed to crossing the ostial lesion. Wiring was successful in entering the SB OM-1, but encountered severe difficulty crossing the ostial lesion MB LCX with the extreme shape of the plaque and entering wire to distal. After predilation in LCX to SB OM1, the geometrical shifting plaque appeared to MB LCX, more narrowed the ostial, making it more difficult to inserted the wire. Eventually, we used “hairpin wire” technique application in the LCX-OM1 bifurcation intervention. A “hairpin” wire was created in a polymer jacketed hypercoat guidewire, advanced into the OM1, and withdrawn pulled back, allowing wiring of the distal LCX, pass the ostial main branch despite with a unique shape of plaque, which was eventually successfully stented.

**CONCLUSION.** We present a challenging percutaneous coronary intervention of bifurcation lesion in case which application of the “hairpin” wire techniques enabled successfully crossing and treatment of the occlusion the bifurcation lesion with a unique shape of the plaque.

**Keywords:** “Hairpin” Wire technique, Bifurcation Lesion, Geometrical Shifting Plaque.

## MY FIRST EXPERIENCE OF RETROGRADE APPROACH IN CHRONIC TOTAL OCCLUSION PCI

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A 65 years old male was referred from another hospital due to chest pain. A month ago, he was diagnosed with Acute Coronary Syndrome, had undergone heparinization and angiography in that hospital. The angiogram showed Normal LM, non significant stenosis at LAD, 90% stenosis at LCX, CTO at mid RCA with good collateral channels from septal. The antegrade-approached-PCI failed, then dissection occurred. Standard treatment was given followed by the second attempt of PCI plan one month later.

For the second attempt in our hospital, we applied retrograde approach by using septal collateral channels (Figure 1) to reach the distal end of the occlusion. It subsequently allows for the use of combined antegrade and retrograde subintimal tracking techniques to connect the dots from both ends of occluded segment when conventional antegrade wire crossing failed. Corsair microcatheter was delivered after BMW wire access to the septal branch but the wire could not make it to reach the distal of the collateral and we changed to Fielder XT-R wire and succeeded. Then the microcatheter was advanced and positioned near the distal end of the occlusion (Figure 2).

We then proceeded with the retrograde wire cross technique to connect the retrograde and antegrade subintimal spaces to true lumen. The antegrade wire was positioned in a segment that used to be the true lumen, as was the retrograde wire. Using the antegrade wire as a landmark, the retrograde one penetrated the subintimal space into the true lumen of the antegrade. (Figure 3). The retrograde wire was positioned into antegrade guiding and advanced the corsair into the guiding as well.

The short retrograde wire used to cross the occlusion was removed, exchanged for a long wire namely RG-3, and advanced through the opposite hemostatic valve in order to convert the recanalization procedure to an antegrade fashion. It is 330 cm long and passed very easily through the Corsair to the antegrade hemostatic valve (Figure 4).

We first withdrew the Corsair to the distal portion of the artery. A rapid exchange balloon was introduced to the distal tip of the retrograde wire, from the antegrade guide. We used Sprinter Legend 2.0/20 balloon, it easily crossed the occlusion because the externalized wire provided great support. After the balloon opened the occlusion (Figure 5), an antegrade workhorse wire advanced through the newly opened vessel. Once proper wire position was confirmed by contralateral injections, the Corsair and its wire were pulled back.

We put two stents overlapped to cover the lesion (Fire Bird 2 3.0/23 and Fire Bird 2 2.75/18) and post dilatation with NC Sprinter 3.5/12, it gained good result (Figure 6). We removed the wire from the Corsair, followed by pulling out the Corsair. As with its insertion, we favored

alternating clockwise/anticlockwise rotations of the Corsair until it reached the retrograde guide catheter. Upon removal of the Corsair, we assessed for potential collateral channels damage and it was proved that there was no contrast staining in the septum (Figure 7).

## ATTACHMENT

Figure 1

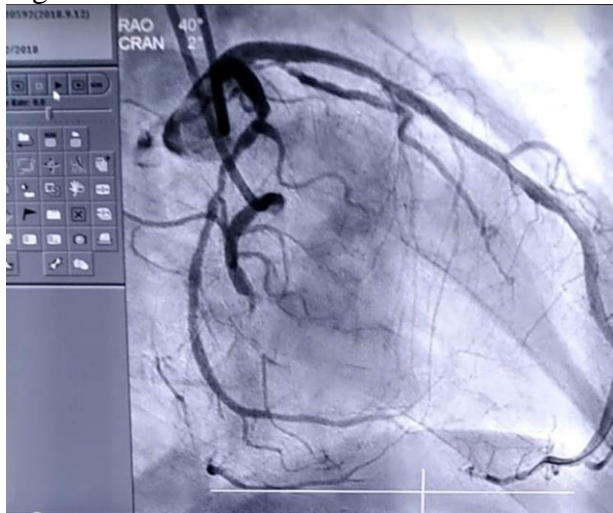


Figure 2

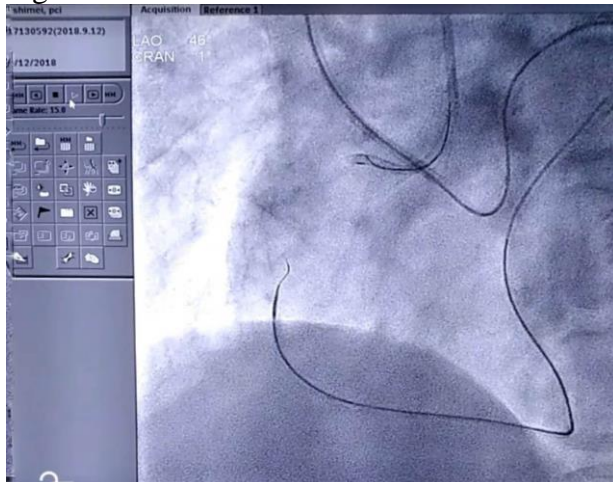


Figure 3

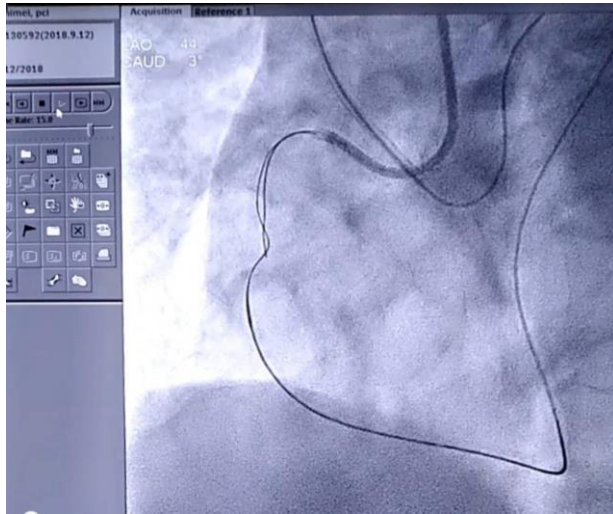


Figure 4

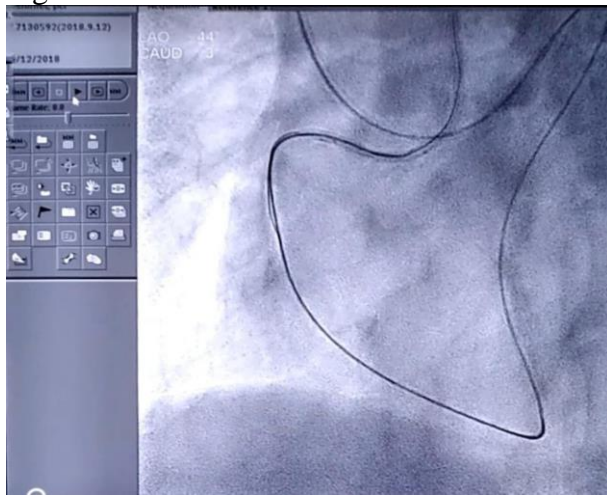


Figure 5

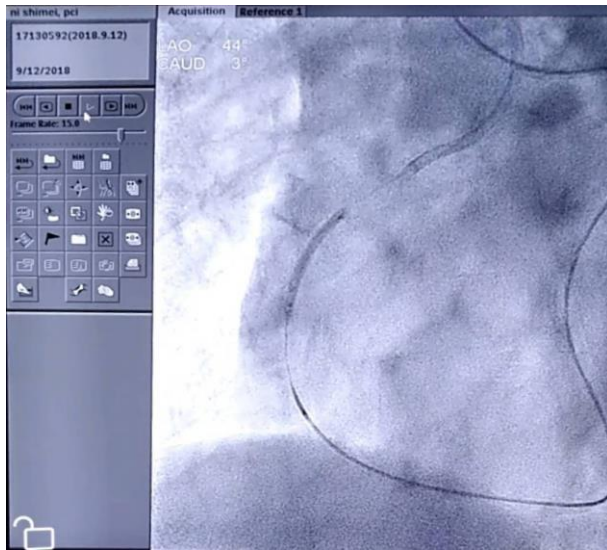


Figure 6



Figure 7





## **PROGRESSIVE INTERMITTENT COMPLETE BALLOON OCCLUSION IN RUPTURED CORONARY ARTERY**

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Rupture of coronary artery secondary to high pressure balloon dilatation is not common but life threatening complication of PCI especially for complex coronary artery disease. 72 years active lady presented to us with stable angina on effort despite optimal medical therapy, her initial angiogram reveals LM and 3 vessel disease which is heavily calcified. So PCI is undertaken and RCA is first opened successfully after rotoring, balloon dilatation and stent deployment so that ischemic burden is partially reduced. After that LAD is approached, even after rotoring, and repeated balloon dilatation using Scoring and NC balloon as means of lesion preparation, the stent cannot be delivered to proximal LAD. Therefore Guide Extension Catheter has to be used to deliver the stent. Finally POT is done at the proximal part, this part damage and cause the LAD to rupture, with development of pericardial tamponade. So progressive complete balloon occlusion repeated for 7 cycles of occlusion followed by one minute of deflation, the time of occlusion started from 3 minutes and progressively increased to maximum of five minutes. When performing angiogram to check the vessel status, dislodgement of the small clot acting as plug on the ruptured vessel is noted possibly due to forceful contrast injection. During the procedure three times of defibrillation has to be done. Accordingly repeated angiogram is decided to be deferred until after 30 minutes which when done shows the jet to be reduced to 1mm. After further occlusion of 5 minutes the last angiogram revealed that the site of rupture is already sealed. The most important thing in the event of perforation is to remain calm during the crisis. The strategy of pericardiocentesis and reversal of anticoagulation should be initiated simultaneously by well-coordinated team. Monitoring and supporting of the vital sign is equally important. It can be concluded that balloon occlusion method if applied properly for adequate duration is a very safe procedure which is to use of cover stent which is not readily available, bulky to deliver and associated with increased late complication of restenosis.



## **SINGLE-STENT STRATEGY IN LEFT MAIN STENOSIS**

**HERENDA MEDISHITA HP, MD**

Significant LMCA (Left Main Coronary Artery) disease is considered as the lesion with the highest prognostic value in the coronary system because of the extent of jeopardised myocardium. Though CABG is considered as gold standard for treatment of left main stenosis, particularly distal left main, evidence is increasing to support the use of PCI with stenting in some cases.

In this national government insurance era, most hospitals are facing budget tightening challenges in each procedures, including in the cath-lab when cardiologists dealing with complex coronary challenges. Some patients with complex lesion are not willing to undergo CABG as treatment option, so cardiologists are left with only few options of revascularization.

We report two cases of patients with distal left main disease, one with critical stenosis of ostial LAD and the other was without bifurcation lesion. We performed a PCI of the distal left main through the transradial route. After the procedure the coronary blood flow were successfully restored into TIMI flow 3 with no residual stenosis. We performed coroangiography evaluation after 2 years post PCI and we found that the stent is still patent with no in-stent restenosis.

The DK Crush V meta analyses of randomized controlled trials of bifurcation coronary stent strategies recommends a provisional single-stent strategy over upfront 2-stent strategy. This simpler option, as appropriate, may reduce fatal longterm sequelae associated with complex 2-stent bifurcation strategies. Our two cases prove that single-stent strategy remains to be an appropriate treatment of left main stenosis when we only have limited resources and options.

Key words : left main, PCI, single-stent strategy, complex lesion

## **ACUTE TOTAL OCCLUSION OF THE LEFT MAIN CORONARY ARTERY : IS IT STILL SAFE WITH CROSS OVER STENTING TECHNIQUE?**

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### Abstract

Acute total occlusion of the left main coronary artery (LMCA) is an uncommon clinical emergency. The presentation of patients with acute LMCA occlusion is usually catastrophic in comparison with occlusion of a more distal coronary bed as they usually present with sudden death or profound cardiogenic shock due to malignant arrhythmia or pump failure. Most patients die without immediate treatment. The data on acute total occlusion of the LMCA with ST-elevation myocardial infarction (STEMI) and cardiogenic shock are relatively limited.

A 53 year old male came to our hospital because of 5 hour onset anteroseptal myocardial infarction. He came with signs of heart failure, hypotension, tachycardia and consciousness began to decline. His CAD risk factors was hypertension and heavy smoker.

Procedure of intervention. Performed right femoral access sheath 7F. Advanced XB 3.5 / 7F GC for LCA cannulation. Advanced Runthrough Hypercoat GW to distal LAD. Advanced thrombo suction to LM-LAD and do thrombus aspiration several times. Medina 1-1-1 lesions were seen in the LM bifurcation, with critical lesions at ostial LCx. DES 3.0 / 25 mm implantation to LM-LAD with crossover stenting technique. TIMI flow 3 and negative dissection results were obtained.

Conclusion. Total acute LM occlusion is a very rare and very challenging case for new interventionists. Fast and appropriate decision making is needed for these patients, with all kinds of limited tools such as IABP, and limited insurance claims such as BPJS. In this case, crossover stenting was carried out on LM-LAD and remained safe for patient.



## **DUPLEX GUIDED RETROGRADE DISTAL TIBIAL ARTERY ACCESS FOR BELOW THE KNEE INTERVENTION**

**Adrianus Kosasih**

Cardiovascular Division, Department of Internal Medicine Trisakti University

Limb saving is one of the main goals of intervention in critical limb ischemia (CLI). On this occasion there will be a case regarding the intervention of chronic infragenicular artery occlusion, which is difficult to access in antegrade fashion.

The patient was a diabetic man with CLI manifested as non healing ulcer. Diagnostic sonographic duplex confirmed by arteriography results in total occlusion in the left anterior (ATA) and posterior (PTA) tibial arteries. The distal PTA appears to be filled by collateral from peroneal artery. Since, there was no visible distal segment of the ATA, it was decided to intervene the PTA. And because there is no PTA stump, it was thought to be difficult to cross the lesion in antegrade fashion. Therefore, we used retrograde distal PTA access using duplex imaging guidance since there was no palpable pulsation.

## “LM TRIBUTARIES: WHAT TO DO WHEN EVERYTHING IS IMPORTANT”

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<sup>1</sup> Hospital Pulau Pinang

### Abstract

Trifurcation lesions are encountered in nearly 10% of cases and poses technical challenges. As in bifurcation, trifurcation lesions should be tailored with angioplasty individually although CABG remains the gold standard, especially for those involving left main stem. Significant left main stenosis is considered as the lesion with highest prognostic value due to extent of jeopardized myocardium.

Here we present a case of a 56-year-old male was referred from secondary hospital with chronic chest pain CCS class III. He was an active gentleman and worked in the shop. He was an ex-smoker and also having dyslipidemia. The patient's ECG showed ST depression in anterior-lateral leads. Echocardiography showed anterior and lateral segment hypokinetic with EF 45% by Simpson.

Coronary angiogram, which was done in another hospital, revealed left main ostium had 40% stenosis, followed by left main distal 50% stenosis. LAD showed 80% stenosis at the ostium, diffuse disease at proximal along with 70% at mid portion. LCX showed 70% stenosis at ostium and intermedius branch was seen with 80% at its ostium. RCA was dominant and normal. The patient's SYNTAX score was 30 and patient was not keen on CABG. According to the angiogram, this was a true trifurcation (Medina score 1-1-1-1). A two-stent strategy plus drug eluting balloon was chosen as a strategy for the LM trifurcation intervention. Six months follow up angiographic outcomes showed good patent LM trifurcation.

Keyword: left main, trifurcation lesion, true trifurcation, two-stent strategy, drug eluting balloon



## **MANAGING PERSISTENT RADIAL ARTERY PERFORATION DURING PERCUTANEOUS CORONARY INTERVENTION**

Hasan Sadikin General Hospital Bandung Indonesia

Utami A.D, MD, Yahya AF, MD

### Abstract

A 59 year old female presented with stable angina pectoris developed radial artery perforation during percutaneous coronary intervention (PCI) via right radial artery.

While advancing the 3.5 EBU 6 Fr guiding catheter resistance was felt, and the patient complained forearm pain. Diluted contrast injection showed contrast extravasation of the radial artery. We were able to continue PCI to left circumflex via the same access after successful insertion of 3.5 EBU 5 Fr GC over PTCA wire. Radial artery evaluation after PCI demonstrated perforation still persist. We managed it using balloon inflation to the perforation site along with external compression of brachial artery. Duplex sonography after procedure confirmed the perforation was sealed.

## DEALING WITH IATROGENIC LONG DISSECTION AT TORTUOUS RCA

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INDONESIA

**Introduction** : Iatrogenic coronary artery dissection commonly occurs during coronary intervention procedure. Extensive dissection of the coronary artery may be life-threatening, and is a potential risk of nonfatal myocardial infarction, emergency surgery, or even a fatal outcome. Dealing with this complication is usually a formidable challenge.

We present a case of right coronary artery dissection after an unsuccessful chronic total occlusion procedure 4 months before.

**Objective (s)** : to learn the PCI techniques for managing coronary artery dissection

### **Material and Method :**

RCA cannulation using JR 3.5/6F, right coronary angiogram showed tortuous RCA, with a long type D dissection and multiple stenosis 70-90% from proximal to distal. Using double wire technique approach : first wire (Sion blue) was placed into the false lumen to seal the entrance, and a second wire (RNS Hypercoat) was used to enter the true lumen. After several attempts, the second wire successfully crossed the lesion and advanced into distal RCA, PLB and PDA. Balloon 2.5x20 mm was advanced to distal RCA but failed to pass through the lesion, the balloon was exchanged with balloon 1.5x15 mm but still could not pass the lesion. The guiding catheter could not give adequate support because the RCA was tortuous. Then we did the “amplatization” of JR to create more support, and changed the balloon size to 1.0x15 mm. Finally balloon 1.0x15 mm successfully crossed the lesion. We did repeated predilatation from proximal to distal RCA with balloon 1.0x15 mm, 10-12 atm, 1.5x15 mm, 12-14 atm and 2.5x20mm, 8-14 atm. Three stents were implanted : DES 3.5x38 mm, 14 atm at mid-distal, overlapped DES 3.5x38 mm, 15 atm at proximal-mid and DES 4.0x22 mm, 16 atm at ostial-proximal.

### **Results (s) :**

PCI with three DES in the long spiral dissection at tortuous RCA using double wire technique was successfully done

### **Conclusion (s) :**

Double wire technique approach in long dissection coronary artery is effective and highly successful



## NO REFLOW PHENOMENON IN PRIMARY PCI : A CASE REPORT

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### ABSTRACT

#### Case Presentation

A 69-year-old female was admitted to the emergency department complaining chest pain since three hours prior admission. Hemodynamic was stable and no abnormal findings on physical examination. ECG showed ST elevation in anterior leads (Figure 1). Laboratory findings were overall within normal limit except, leukocyte 12.700 (neutrophil 86%), random blood glucose 200 mg/dl, cholesterol 221 mg/dl, and troponin T 5162 pg/ml. Aspirin 320 mg and Ticagrelol 180 mg were administered prior primary PCI procedure. There was total occlusion at proximal segment of Left Anterior Descending (LAD) with thrombus present (Figure 2). The primary PCI was performed, using direct stenting strategy and 2 drug eluting stent CRE-8® 3.0x31mm and CRE-8® 2.5x25mm were implanted from proximal to mid LAD. Unfortunately there was no-reflow phenomenon following DES implant (Figure 3). So, continuation of intravenous anticoagulant was administered, in addition to dual antiplatelet ACE-I and high dose statin were also administered. Patient later observed intensively at ICCU. Two days after the procedure, patient was still complaining of angina, and hemodynamic profiles were declining, The patient encountered lethal arrhythmia on day-3 after procedure, and failed to be resuscitated.

#### Discussion

No-reflow is a phenomenon which is a successful opening of obstructed epicardial artery with sustain diminished of myocardial perfusion. Clinically it manifests with recurrence symptoms and highly probability to develop acute failure, cardiogenic shock, lethal arrhythmias and cardiac arrest. No reflow is multifactorial, high neutrophil count, older age (>55 years old), higher thrombus grade, high blood sugar, and prolong onset of chest pain (>4 hours), are the risk factors existing in our patient. Micro-embolization of atherothrombotic debris during PCI remains the principal mechanism responsible for this microvascular obstruction. Optimal loading dose of antiplatelet are crucial in prevention of thrombo-embolic. However we found despite adequate pre-loading of antiplatelet as in this case, the reperfusion was not warranted. There are various strategies to tackle

thromboembolism are manual thrombus aspiration, mechanical thrombectomy, direct stenting without prior ballooning and often combined with prior thrombus aspiration, embolic protection devices and intracoronary abciximab. Intracoronary adenosine, Calcium antagonist, nicorandil, nitroprusside, GPIIb/IIIa, and thrombolitics are options medication on which can be administered following no-reflow phenomenon. Unfortunately no reflow may resistant in 5–10% cases, hence prevention of no reflow is better than treatment. Continuation of researches regarding this phenomenon are still needed to better understand, prevention and treatment.

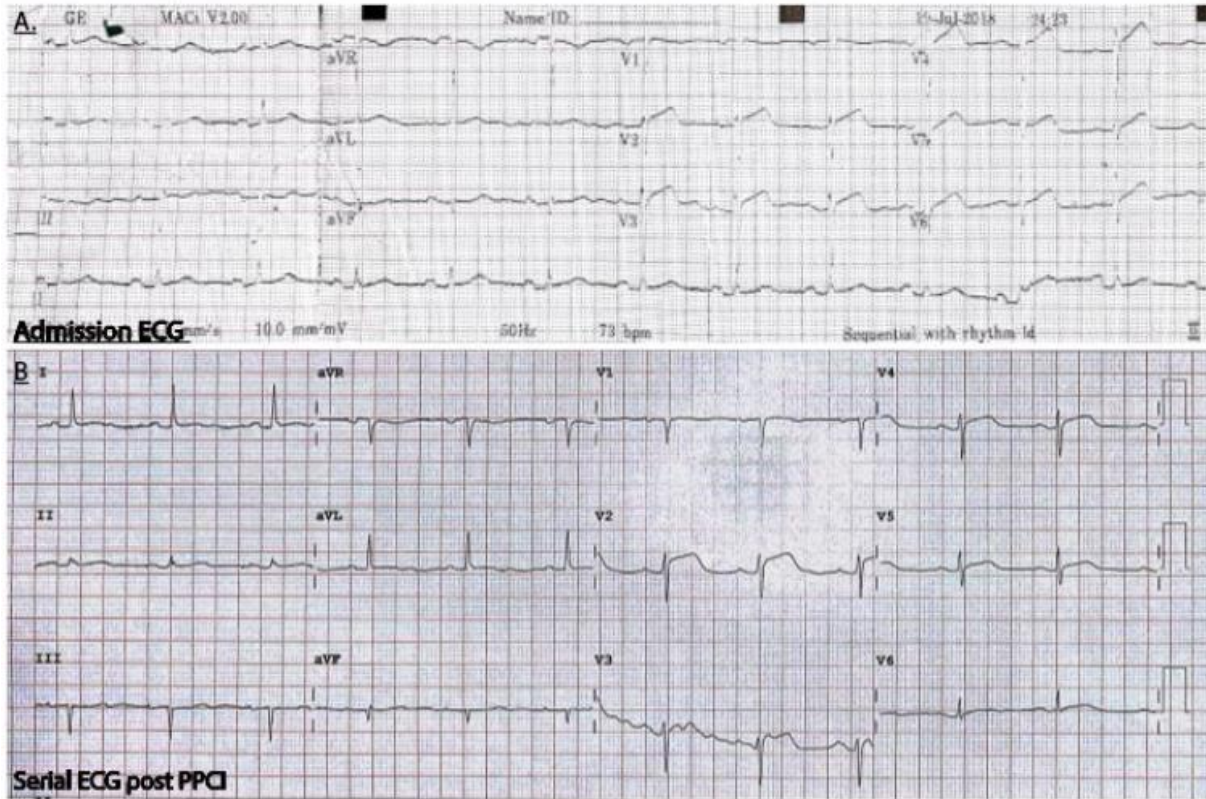


Figure 1. (A) ECG of the patient with chest pain from emergency room shows ST elevation at V2-V4. (B) Serial ECG on 4 hours after PPCI.

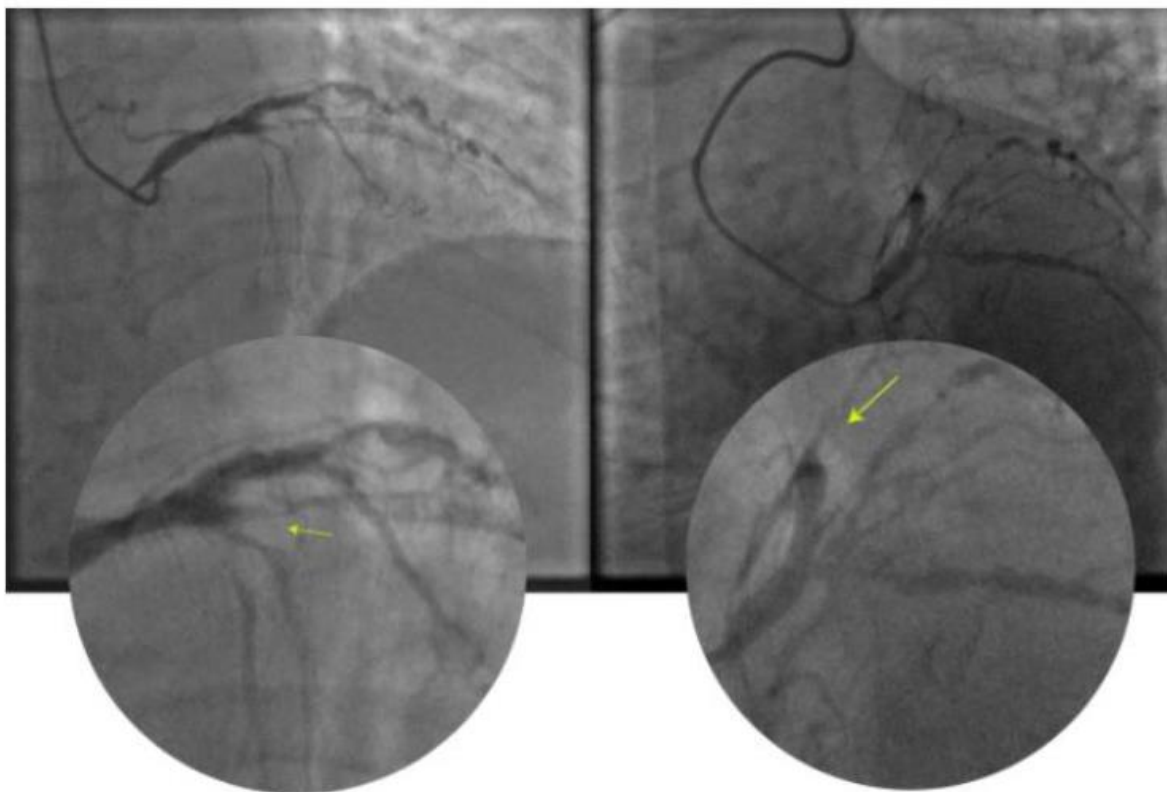


Figure 2. Total occlusion by thrombus in proximal segment of Left Anterior Descending (LAD) coronary artery

## CATASTROPHIC SITUATION DURING PRIMARY PCI IN MYELOPROLIFERATIVE DISORDER-RELATED ACUTE MYOCARDIAL INFARCTION

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### ABSTRACT

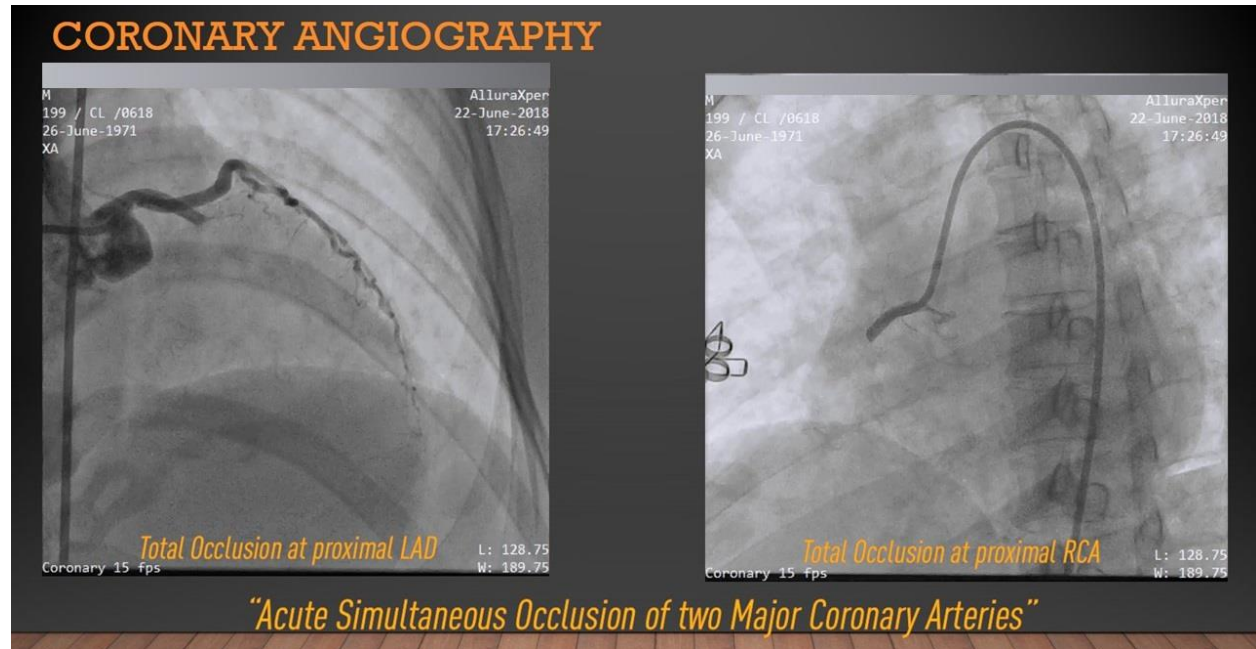
**Background:** Acute myocardial-infarction is one of fatal complication of myeloproliferative disorder, but its presentation and management are not clearly defined yet, particularly about angiographic finding and procedural aspects of primary PCI.

**Case:** A 46 y.o female came to emergency-room with acute typical-chest pain, 4 hours before admission. She had no history of diabetes-mellitus, hypertension, dyslipidemia, or smoking. She had history of deep vein thrombosis at left leg. ECG shows sinus tachycardia with ST-elevation of II, III, aVF, V4-6R leads, complete-RBBB. Hs-Troponin T was 486.4 pg/ml. CBC revealed erythrocytosis(Hb-21.2) and thrombocytosis(Plt-1.342.000) indicating myeloproliferative disorder. Primary PCI was done, coronary angiogram shows total occlusion in proximal right coronary artery and left anterior descending artery. Manual thrombus aspiration was done in RCA and we deliver direct stenting in proximal RCA. LAD underwent balloon-predilatation and stent delivery was done at proximal LAD. During the procedure patient suffered acute-closure in LAD, leading to cardiac arrest. Several attempts of resuscitation were done and patient were ROSC. Thrombus aspiration and administration of several antithrombotics agent were done. Primary PCI was successfully done, patient was observed at ICCU for 7 days and discharged at day 8.

**Discussion:** Thrombocytosis and erythrocytosis are associated with hypercoagulability and hyperviscosity which could lead large thrombus burden. Acute simultaneous occlusion of two major coronary arteries were the evidence. Since RCA and LAD were culprit lesion, multi-vessel PCI was done. Thrombus aspiration and direct stenting were best choice in PCI procedure, and also intracoronary thrombolysis could help in decreasing thrombus burden. Catastrophic complications like abrupt closure and cardiac arrest could easily happened in primary PCI, need in high-awareness and calmness during the procedure.

**Conclusion:** We reported patient with myeloproliferative disorder-related STEMI, which undergo primary PCI. Catastrophic complication was occurred, but the procedure was successful after resuscitation, suitable procedural techniques and also medications.

**Keywords:** Primary PCI, acute myocardial infarction, STEMI, thrombocytosis, erythrocytosis



## **IATROGENIC ANTEGRADE DISSECTION OF FRAGILE RIGHT CORONARY ARTERY AFTER SURVIVING ACUTE NECROTIZING PANCREATITIS AND ACUTE ANTERIOR WALL MI DUE TO SPONTANEOUS DISSECTION OF THE LAD**

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**Background:** Acute necrotizing pancreatitis may have complications of organ dysfunction including severe inflammation of the arterial wall. Multiple inflammatory cytokines together with the increase in catecholamine change microstructural and functional property of the coronary arteries resulting in the fragility of the vessel wall that is prone to dissect spontaneously or iatrogenically. Coronary angiography is safe, however complications of coronary dissection may arise during the procedure in such fragile arteries with no atheroma.

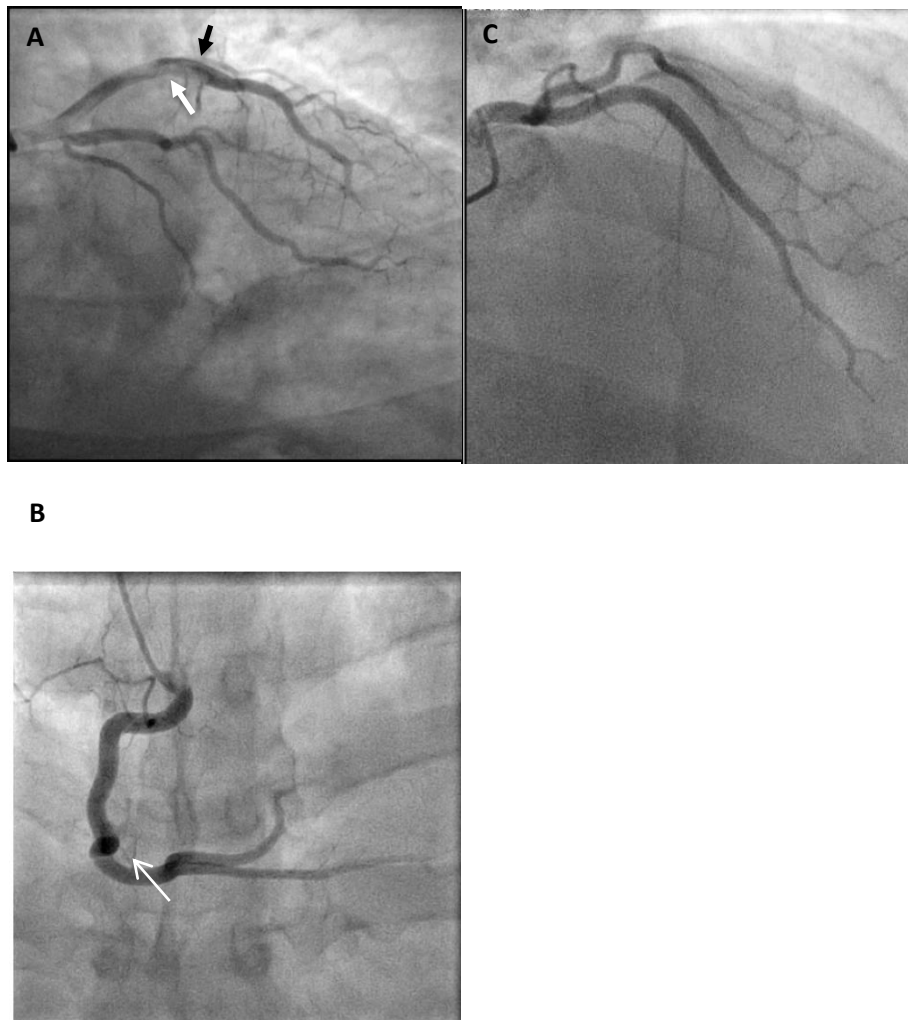
**Case:** We reported a male, 39 years old presenting with severe abdominal pain accompanied by fever. Acute necrotizing pancreatitis was confirmed by CT scan aligned with all the laboratory findings. During the course of the disease, he experienced acute anterior wall MI presenting as ST elevation in the ECG and coronary angiography revealed a spontaneous spiral dissection of the LAD with the presence of large non-occlusive thrombus (Figure 1A) and small suspicious dissection of the proximal RCA (Figure 1B). Optimal medical treatment was decided because the artery was flowing and considering the risk of bleeding because of anticoagulation and in presence of hemorrhagic ascites. We found a significant improvement in his clinical condition within 2 weeks. A repeated CAG was then performed, when we found that the thrombus in LAD was completely resolved (Figure 1B). RCA was engaged using JR 3.5 catheter and it revealed an extensive antegrade spiral dissection of the RCA arising from the ostium down to the mid portion of the artery (Figure 2A), which we thought to be induced by the catheter. It was difficult to wire the true lumen and therefore a double-wired technique was performed to advance the wire distally to the true lumen. Three DES of 4.0x32mm; 4.0x32mm; and 4.2x20mm was deployed to cover the dissected area all the up to the ostium of the RCA (Figure 2B). Three days afterwards, patient was discharged with good clinical performance.

**Conclusion:** Spontaneous spiral dissection of the coronary artery in acute anterior wall MI may be a representation of acute necrotizing pancreatitis. A fragile coronary artery after severe systemic inflammation is susceptible to iatrogenic coronary dissection during diagnostic

angiography. The complication is rare, but careful consideration of the underlying condition is needed to prevent it. It is a very challenging situation and appropriate techniques is necessary to overcome the problem with satisfactory result.

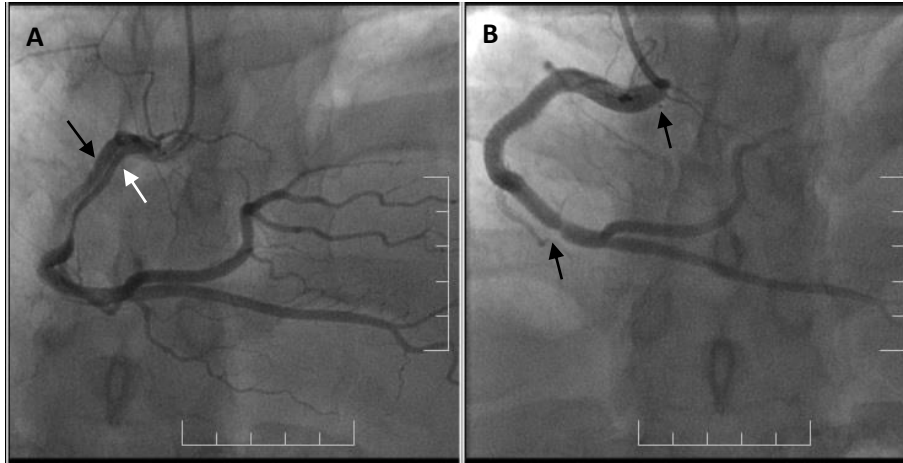
### Supplemental Figure

**Figure 1**



- A.** Spontaneous spiral dissection in LAD with large non-occlusive thrombus observed during first angiography (black arrow shows dissection; white arrow shows thrombus). **B.** Suspicion of spontaneous spiral dissection of the RCA (arrow). **C.** Angiography evaluation after optimal medical treatment shows complete resolution of the thrombus in LAD.
- B.**

**Figure 2**



**A.** Extensive antegrade spiral dissection of the RCA observed during RCA graphy (black arrow shows false lumen; white arrow shows true lumen). **B.** Angiography evaluation after deployment of three DES along the dissected area up to the ostium of the RCA (black arrows shows landing zones of the DES).



## PERCUTANEOUS CLOSURE OF A PERIMEMBRANOUS VENTRICULAR SEPTAL DEFECT THROUGH ARM APPROACH (RADIAL ARTERY): SINGLE CENTRE EXPERIENCE

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### Abstract

**Background:** Percutaneous device closure of perimembranous ventricular septal defect (pmVSD) has shown great success as a sustainable alternative to surgical closure. Though the incidence and complication of femoral access, little consideration is given to the access related complications and access choices. We report, to the best of our knowledge, the first pmVSD closure performed through radial artery (RA) access (arm access) at our centre.

**Case Illustration:** A 34-year-old female, known case of pmVSD presented for routine follow up. A transoesophageal echocardiogram (TOE) revealed an pmVSD defect with left to right shunt. The defect size was 5 mm and a peak left to right gradient of 72 mmHg across the defect. Left ventricular (LV) volume overload was not seen. There was no evidence of aortic valve prolapse, aortic regurgitation or evidence of infective endocarditis. LV systolic function was normal. The anatomy of the defect appeared suitable for device closure.

**Procedure:** Right radial arterial access was achieved using a 6 French hydrophilic coated sheet. Procedure was monitored under TOE. 3000 IU of intravenous heparin was given. We used a 5 French pigtail catheter to perform left ventriculography in deep left anterior oblique (LAO) cranial angulation. Ventriculography revealed a defect size of 7.36 mm. Under fluoroscopy guidance the pmVSD was crossed using a 6 french Judkins right 3.5 (JR-3.5) diagnostic catheter and an angled hydrophilic glide wire. Under angiographic and TOE guidance, a Amplatzer duct occluder II (ADO II) 6/4 was deployed. The TOE showed excellent result with no encroachment on the aortic valve, no aortic regurgitation and no residual left to right shunting

**Discussion:** Traditionally transcatheter VSD closure involves primary vascular access via a central vein with a secondary access via an artery. The closure device is loaded through the transvenous approach and the secondary arterial access is used to capture the guide wire. This is a tedious process requiring formation of AV loop and high level of technical expertise is required. Crossing of pmVSDs is easier from the radial arterial approach using a JR 3.5 catheter with advantages of lower access related complications, improved morbidity, early ambulation, and overwhelming patient preference.



**Conclusion:** Here, we demonstrate that percutaneous closure of a pmVSD using transradial approach is successful, safe and can avoid the potential risks of bleeding and vascular complications associated particularly with challenged access situation.

**Keywords:** Percutaneous Device Closure, perimembranous ventricular septal defect (pmVSD), Transradial approach



## **SUCCESSFUL ANTEGRADE CTO PCI CASE : LIVE IMAGING (IVUS) OCCLUSION BREAKTHROUGH**

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Coronary chronic total occlusions (CTO) are commonly encountered complex lesions defined as > 99% blockage for 3 months or more, and are responsible for a clinically significant decrease in blood flow (TIMI 0-1). CTO brings significant impact on mortality, however successful CTO PCI significantly reduced mortality rate and MACE.

To increase the success rate of CTO intervention, many technique and devices have been developed, including the role of intravascular ultrasound (IVUS). In some cases, IVUS will surely be a useful device to detect the entry point (side branch method), to define true lumen/false lumen, to ensure of the guidewire in the true lumen CTO, and to navigate guidewire from false lumen to true lumen (true lumen re-entry method)

We hereby present a case of successful percutaneous treatment for CTO of 61 years old male patient with diabetes dan hypertension, by using antegrade approach with live IVUS imaging to help define the ostial of CTO and to ensure the guidewire was in the true lumen. This case report was aimed to revisit this rare antegrade technique to emphasize the usefulness of IVUS in some CTO cases.

## FEASIBILITY OF 6FR AD HOC TRANSRADIAL TWO-STENT STRATEGY ON LEFT MAIN BIFURCATION STENTING

Yusuf Galenta, Amir Aziz Alkatiri

### Clinical information :

A 47 years old male with a history of stable angina CCS 2 for 1 month and he had positive stress test. Risk factors include hypertension and ex smoker. Physical examination was remarkable. ECG has showed slight ST segment depression on V2-V4. He was sent to cathlab for coronary angiography.

### Coronary Angiography :

Angiography findings : LM: stenosis 50% at distal part, LAD: stenosis 50-70% at ostial to proximal part, LCx : ostial stenosis 90% , RCA was normal.

**Crucial Question :** Regarding the complexity of bifurcation lesions , should we convert to femoral access or 7Fr system?

### PCI:

A 6 Fr EBU 3.5 guide catheter was engaged the left coronary ostium. We plan for T-stenting and protrusion (TAP) technique for the bifurcation. A 0.014" wire was inserted to LAD and second 0.014" wire to LCx . Predilation with 2,5 x 20 mm balloon at LM to LCx proximal up to 10 atm. Using the same balloon 2,5 x 20 mm to predilate LM to LAD proximal up to 16 atm. LM-LAD stenting with DES 3.0 x 28 mm up to 14 atm. After rewiring LCx, opening stent strut with 1.5 x 15 mm balloon up to 18 atm, upsize with 2,5 x 20 mm balloon up to 14 atm. Stenting LCx with DES 2,75 x 15 mm with slight protrusion to the distal LM , inflated up to 14 atm. Final kissing balloon was performed with 3,0 x 28 mm balloon placed LM-LAD and then second balloon 2,5 x 20 mm placed to the LM-LCx. Proximal optimization technique (POT) on LM with NC balloon 3,5 x 12 mm up to 16 atm was commenced. Final result was acceptable.

### Conclusion

Dealing with left main bifurcation lesion is challenging and maybe tricky. We have shown feasibility of LM bifurcation stenting (two stent strategy) via trans radial 6Fr in ad-hoc setting.

## **CASE REPORT: STEP BY STEP ENDOVASCULAR IN COMPLEX AORTOILIAC LESSION**

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**Apollo Hospital Ltd Ahmedabad- India,**

**Saiful Anwar Hospital-Brawijaya University Malang-Indonesia**

### **Case Introduction**

First Case: A 35 y.o man with main symptoms of buttock severe claudicatio. Risk factor was smoker and hypertension. No symptom of sexual problem. Renal function with normal limit. DUS showed no flow in distal aorta with monophasic tardus parvus waveforms in distal vessel, as describe? Due to aortic occlusion. CTA showed Complete occlusion of the distal aorta (distal to IMA origin) its bifurcation and bilateral CIA noted (R>L) <5 cm with mildly reduced luminal caliber and reduced contrast intensity in rest of the both lower limb arterial system (from collateral ).

Second Case: A 58 y.o man with risk factor of diabetic, hypertension and tobacco addictive come to our department with unhealing ischemia ulcer at both leg. He got amputated on left toe at 2010 and done bypass graft femoropopliteal at 2011 and POBA at poplite artery 2011. He got anterior wall miocard infarct at 2016 and the CAG result was tripple vessel disease with suggestion to do bypass surgery but patient refused. This time (2018) patient came with gangrens of left leg and unhealing ulcer at right leg so patient has to do amputation at left leg (below the knee). CTA showed complete occlusion at right Common Iliac Artery (CIA), moderate to severe luminal narrowing in left CIA, completed occluded graft noted, and completely occlusion at left SFA from origin.

### **Angiographic Findings**

First Case: Peripheral angiography from left brachial and femoral acces showed a completely occlusion distal aortic till before level of iliac bifurcatio

Second Case: Peripheral angiography from left brachial and femoral acces showed a completely occlusion since origin of right CIA continue with multiple significant stenosis at External Iliac Artery (EIA) and mutiple stenosis until 80% at left CIA extending to EIA with completely occluded at left SFA.

### **Brief Introduction of Strategies & Complications**

Percutaneous transluminal angioplasty has become widely spread as the initial treatment in patients with Aorto iliac occlusive disease. Although not confirmed by the current TransAtlantic Inter-Society Consensus (TASC) II recommendations, endovascular repair of complex aortoiliac lesions is feasible and gives similar angiographic and clinical outcome compared with open surgery at both short- and long-term follow-up, even in complex lesion configurations. Besides the commonly accepted TASC A and B lesions, TASC C and D lesions could also be treated endovascularly with the current devices, techniques and modalities.

First Case: Puncture at right CFA put 7F sheath and succesfull subintimal crossed with terumo hydrophilic J wire and MP catheter 5F. Get another acces from brachial and left CIA. Predilatation with 6x40 mm ballon at distal aortic and continue with deployed Lifestar Vascular Self Expandable Stent 14X40 mm. Dissection at origin of left CIA. Decided to inflated ballon expendable stent omnilink elite at right CIA (8X29 mm) and left CIA (8X39 mm) protruding 3 mm at aortic level with view angiography from pigtail 5F form brachial acces. Post dilatation with kissing with both ex-stent ballon. Succesfully procedure with Timi 3 flow.

Second Case: First time this procedure try to cross right CIA from right femoral acces with 6F sheat inserted terumo non stiff wire with Judkins Right (JR) catheter but unsuccessfull to cross occlusion site. Alternative step with 6F sheath inserted from left brachial continue with inserted terumo Radifocus guide wire M Angled 0.035- 260 cm until left CIA and changes 6F sheath with long sheat 6F-80 cm. Inserted guiding catheter MP 6F and Terumo Radifocus guide wire M successfully cross the right CIA and continued grab this wire with snare assist through out right femoral sheath. Inserted another terumo wire 260 cm into brachial acces and cross stenosis lesion at left CIA until the occlusion of SFA origin to make a marker puncture for left femoral acces. Succesfully puncture at left femoral acces with 6F sheath. Inserted terumo stiffed wire from left femoral acces cross the lesion at CIA. Inserted peripheral ballon Admiral Medtronic 6x120 mm at left CIA inflated 10 atm at 2 minute & continue with the right iliac form right femoral acces inflated

10 atm at 2 minute. Inserted self expandable stent Everflex 8X120 mm in right iliac and inserted another self expandable stent Absolute Pro LL 8x120 mm in left iliac and do angiography from MP Catheter at brachial acces for get the appropriate position and then release both stent at the same time. Inserted peripheral ballon 8x100 mm in right iliac and admiral Medtronic 8x60 mm in left iliac inflate together with 10 atm for 1 minute. Show there is a dissection at distal right iliac stent and can dismiss with inflated 8x100 mm ballon 6 atm. Procedure successfully with Timi 3 and continue Injected kontras from sheath left femoral and show there is completely occlusion at profunda femoralis and superficialis arteries with bridging collateral from proximal than can give collateral to distal SFA until poplitea artery. Distal right CFA was not evaluated but planned do completely angiography later if patient still symptomatic.

## **Result and Summary**

Endovascular therapy in aortic iliac occlusion disease is a well-established procedure in clinical practice and there has been an evolution to treat more and more complex lesions. The type of stent should be well considered and depends on the morphology and localization of the lesion. Self-expandable stents are often used in complex and long iliac lesions, while short and clearly calcified lesions are preferably treated with balloon-expandable stents, which can also be placed very accurately.

Lesions can be accessed from the ipsilateral femoral, contralateral femoral, and brachial approach and both the intraluminal and the subintimal space can be used for successful recanalization. Angioplasty is often associated with lower periprocedural morbidity and mortality rates. Conversely, surgery sometimes provides greater long-term patency, although late failure of percutaneous therapies may occur but still can be treated successfully with reintervention.

## **Learning Points**

In our opinion, the results of endovascular therapy for aorto iliac occlusion disease will be further improved by continuous technical evolution and new material developments. In light of the current evolution towards minimally invasive techniques, an increasing number of experienced centers will be able to treat the vast majority of all arterial pathology by endovascular means.

## DEALING WITH MULTI VESSEL AND COMPLEX PCI. WHAT IS THE BEST STRATEGY?

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**Introduction:** Myocardial revascularization is performed for relief of symptoms of myocardial ischemia and improvement of prognosis. In stable coronary artery disease, the prognostic benefit is dependent on the extent of myocardium subject to ischemia. With the exception of subtotal occlusion in major coronary vessel, angiography alone does not suffice to establish the indication for PCI, but documentation of ischemia or hemodynamic relevance is required.

**Case:** A 55 years-old man came to our catheterization laboratory for elective PCI. He had history of stable angina pectoris since three month before. Risk factors were hypertension and diabetes mellitus. Coronary angiography revealed significant stenosis at distal left main, mid part of LAD, and ostial LCx. This case involving left main disease and bifurcation lesion with Medina type 1-0-1 and SYNTAX score: 25 (intermediate). FFR was measured to choose which lesion that amenable for PCI. Based on FFR result, we decided to perform PCI at mid LAD. Guiding catheter XB 3.5/6F and workhorse wire were passed to distal LAD. Predilatation with balloon 2.0 x 20 mm maximal 16 atm at mid LAD. Mid part of LAD was stented with DES stent 3.0 x 28 mm with good result.

**Conclusion:** Objective evidence of myocardial ischemia by stress imaging and are key to clinical decision for myocardial revascularization. FFR-guided PCI should be considered in patients with multivessel disease undergoing PCI.

**Keyword:** *Multivessel PCI, stress imaging, myocardial ischemia, stable coronary artery disease, fractional-flow reserve*



## PERCUTANEOUS CORONARY INTERVENTION ON CHRONIC TOTAL OCCLUSION STEP BY STEP

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**Introduction** : It has been estimated that coronary with chronic total occlusion (CTO) is encountered in 15 to 20% patients referred for coronary angiography (CAG). The success of percutaneous coronary intervention (PCI) on CTO can be attributed to the vast array of hardware that has now become available and also to the vastly enhanced operator expertise. However failure PCI on CTO can still occurs. This can be due to a failure to cross the lesion with a guide wire and the second cause of failure is the inability to cross the lesion with a balloon.

**Aims** : to present CTO case with an antegrade approach where there are obstacles in passing through lesions both wire and balloon and how we adhere to them with existing equipment and techniques.

**Case illustration** : a 52 years old man with stable angina pectoris CCS III. CAG had been done before. The results was CAD 3 vessel diseases with RCA CTO in proximal part and distal part filled from contralateral. We use guiding catheter (GC) AL 1/6F to RCA via right femoralis artery and catheter Opitorque 5F for LCA via right radialis artery for contralateral injection. First we tried guide wire (GW) Fielder FC with back up microcatheter Finecross to pass through the lesion in RCA. The GW cannot penetrate the lesion (wire failure to cross The lesion) and we replaced with GW Gaia 3. To increase support from GC we did an anchor ballon technique to The RV Branch with GW Fielder FC and ballon Maverick 2.0/20mm. Lession can be penetrated with GW Gaia 3 to the distal part then we replaced with GW Sion Blue and Tazuna 1,25/10mm ballon was inserted. The ballon couldn't go through the middle part (balon failure to cross the lession) so we decided to do grenadoplasty or ballon-assisted microdissection (BAM). After that we predilated the lession with ballon Ryujin 1,25/10mm and Maverick 2.0/20mm from proximal to distal part. DES Promus Element 2.5/38mm was implanted in mid to distal and the second DES also Promus Elements 3.0/38mm was implanted in proximal to mid overlap with the first stent. From CAG evaluation we found theres another CTO in the first distal DES. So we repeated the procedure as above. We used GC JR 3.5/6F with GW Gaia 3 and a microcatheter finecross to penetrate the lesion and after that we did POBA with balon Ryujin 1.25 /10mm. The final Result is good no residual stenosis, no trombus and no dissection.



**Resume :** CTO remain one of the most difficult lesion subsets confronting an interventional cardiologist. Wire and balloon failure through the lesion are two major factors in PCI with CTO. readiness of various tools both catheters and wire also balloon and the experience of operators to perform various techniques in the case with CTO can provide success in action. The last one always prepare for the unexpected because there are no easy CTO cases. CAG evaluation after procedure is important to make sure no complication during The prosedur.

## 2017 ESC RECOMMENDATION : DOOR TO WIRE CROSSING TIME IN PRIMARY PCI

### LOCAL INTRACORONARY SINGLE BOLUS ADMINISTRATION OF THROMBOLYTIC ALTEPLASE FOR THE MANAGEMENT OF ACUTE MYOCARDIAL INFARCTION IN PATIENTS PRESENTING WITH ST-SEGMENT ELEVATION WITHIN 12 HOURS OF SYMPTOM ONSET

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ADAM MALIK GENERAL HOSPITAL / CARDIOLOGY DEPARTMENT FACULTY MEDICINE, UNIVERSITY OF SUMATERA UTARA, MURNI TEGUH MEMORIAL HOSPITALMEDAN, INDONESIA

#### Objective(s):

This study aimed to evaluate the door to wire crossing time (DWC) and the effects of local intracoronary single bolus administration of alteplase (ALP) to lysis the occlusive thrombus and distal micro-embolization for preventing microvascular obstruction (MVO) and obtaining complete reperfusion of microcirculation level in acute STEMI patients with TIMI 0/1.

**Material and Method:** This is a prospective nonrandomized controlled study. We included acute-subacute STEMI patients TIMI flow 0-1 with symptom onset 12 h. The culprit vessel was recanalized by wire crossing followed by balloon inflation or thrombectomy (TBE), and continued administration of EPT 3.75 mg, ALP 3.5 mg. After stent deployment NTG 200 µg was added. The control group is colleagues' patients with standard pPCI. TIMI, MBG flow and cTFC were graded by two interpreters.

**Result(s):** There were 105 patients from October 2016 to July 2018, age 37- 68 y. There were 96 males, 9 females, 53 anterior and 52 inferior wall infarction. Preprocedural TIMI and MBG 0 were 90 patients, TIMI and MBG 1 were 15 patients. Postprocedural TIMI and MBG 3 were 95 patients, TIMI and MBG 2 were 10 patients, DWC 26 - 250 minutes (DTW ≤ 60 minutes 14 patients, 61 to 90 minutes 17 patients, 91 to 120 minutes 22 patients, ≥121 52 patients), median-cTFC 18.8, LVEF increased 7.44 - 31.5 %. There were 2 patients with gums bleeding, no mortality was found during 30 days follow-up, hospital mortality was 2.85 %. The control group was 105 patients. Postprocedural TIMI and MBG 3 were 54 patients, TIMI and MBG 2 were 48 patients, TIMI and MBG 1 were 3 patients. median-cTFC 23.0 Statistically, there was significant difference in postprocedural TIMI, MBG flow, cTFC between the 2 groups ( $p=0.001$ ).

**Conclusion:** Local intracoronary eptifibatide, alteplase, and nitroglycerine combination showed a better result in reperfusion of myocardial blood flow and improved LV function.

## ACUTE MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES

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**Background** ST-elevation Myocardial Infarction (STEMI) commonly occurs when a coronary artery becomes totally occluded by a blood-clot disrupting blood flow to the myocardium. However, there is a condition where the common etiology is not present, thus called Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA).

**Case Description** A forty-nine years old caucasian male came to emergency department with about two hour typical chest pain with cold sweating then diagnosed with anteroseptal STEMI. Patient had no history of chest pain, hypertension, diabetes, smoking cessation, or alcohol abuse, but there were some history of syncope and shortness of breath after exercise. Physical examination showed blood pressure 123/80, heart rate 97 beats per minute, heart thrill with a grade IV/VI crescendo-decrescendo systolic rumbling murmur that radiated to the carotis. The ECG showed significant ST elevation at aVR, V1-V2 with hyperacute T at V3-V4 and reciprocal at inferior lead, consistent with anteroseptal myocardial infarction. Laboratory testing showed cardiac Hs-Troponin I elevation at 4841,3 ng/L. In the cath-lab, coronary angiography showed normal coronary vessel with TIMI 3 flow, and the working diagnosis changed to MINOCA. Bedside echocardiographic examination showed AV jet velocity 4,5 m/s; AVA planimetry area 0,674 cm<sup>2</sup>; AV mean PG 51.9 mmHg, we assume that the elevation of ST segment and cardiac troponin is may from myocardial oxygen demand-supply diproportion due to coronary microvascular dysfunction from the aortic stenosis problem. The patient then treated conservatively with aspirin, atorvastatin, bisoprolol and stabilized for the chest pain, daily follow up showed resolving of ST elevation and the chest pain dissolved. After 4 days observation, patient out-hospitalized with planning of follow up with a non-invasive dobutamine-stress echocardiography test and education for aortic valve repairment. Unfortunately the patient decease before the test held.

**Conclusion** MINOCA is a working diagnosis when there is no evidence of coronary artery obstruction in a clinically diagnosed STEMI patient. Further examination is required to define the main etiology. Stress-test echocardiography or stress-test CMR may be held if the suggestive origin is microvascular coronary dysfunction.

**Keyword** STEMI, MINOCA, Aortic Stenosis

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## INTRAVASCULAR ULTRASOUND (IVUS) GUIDED PERCUTANEOUS CORONARY INTERVENTION (PCI) IN FEMALE PATIENT WITH LEFT MAIN (LM) – LEFT ANTERIOR DESCENDING (LAD) ARTERY STENOSIS

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**Objective** Patients with lesions in LAD have prevalence stenosis in LM almost 90%. Intracoronary imaging, especially IVUS has an important role determining their plaques burden. While IVUS has many other beneficial effect in PCI, European Society of Cardiology (ESC) also states that using IVUS in LM disease case will reduce patients mortality and morbidity.

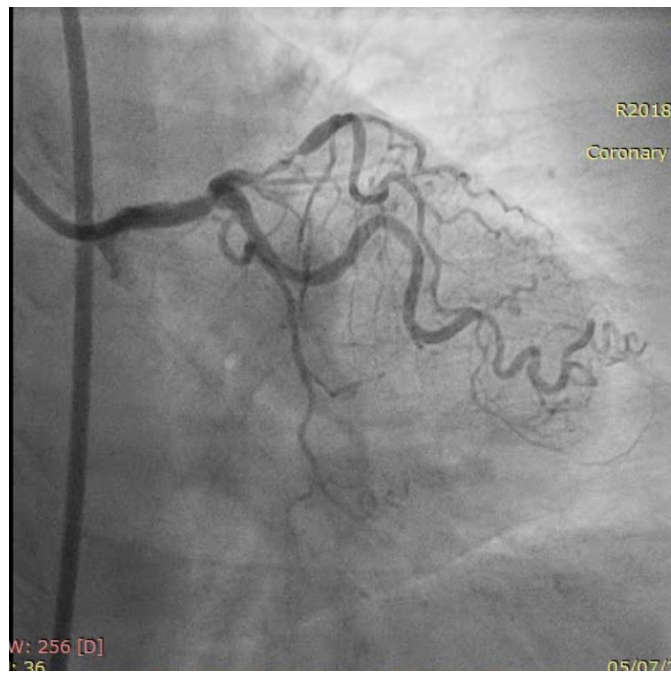
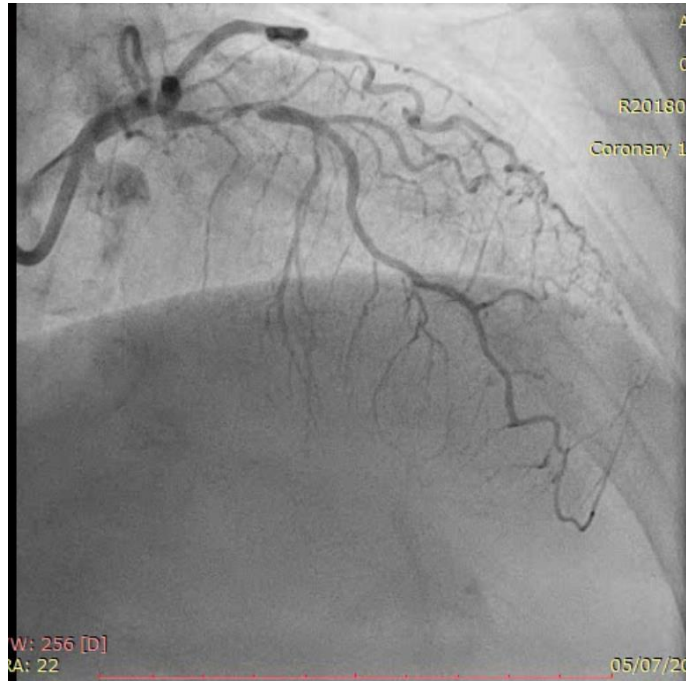
**Material and Methods** N/A

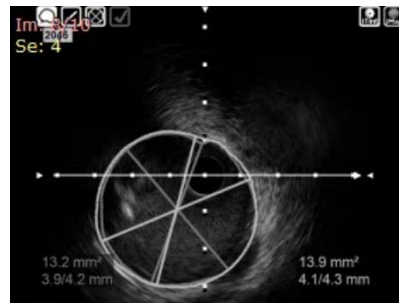
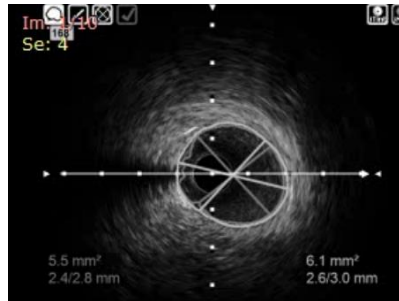
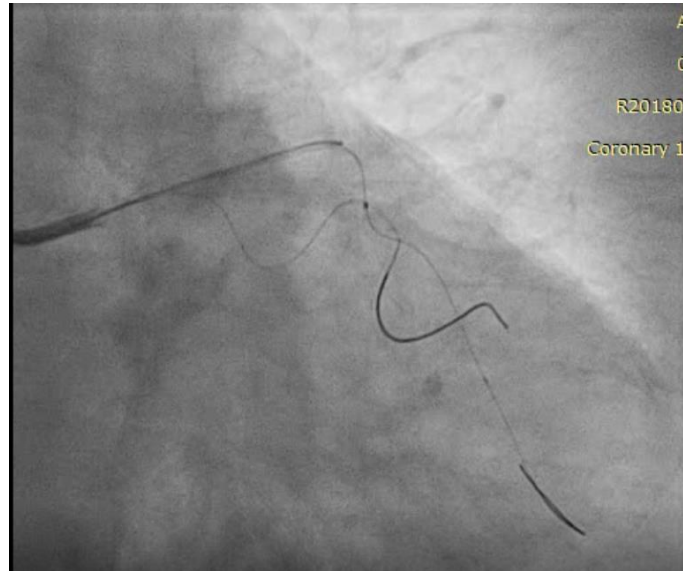
**Results** A sixty seven years old, female patient was performed angiography standby PCI because of 3 vessel coronary artery disease with LM disease from previous angiography. It performed using femoral artery access with 7 Fr sheath and using XB 3.5 7 Fr- guiding catheter. Angiography shows moderate stenosis in distal LM, LAD looks tortuous and heavy stenosis in the proximal, Left Circumflex (LCx) artery looks fine. Right coronary artery angiography wasn't performed. After predilatation ballooning in LAD, IVUS evaluation on LM and LAD was performed. Both of them showed mixed plaques with reference diameter 2.8 mm for LAD and 4.2 mm for LM, and plaques burden in LCx less than 20%. It was decided to perform crossover PCI in LM-LAD with sidebranch protection. One Drug Eluting Stent (DES) (Firebird 3.0x23) was placed in mid LAD, and another one (Supraflex 4.5x20mm) was placed overlapping proximally until mid LM. Post stent evaluation of IVUS showed Cross sectional area of proximal LAD was 12mm<sup>2</sup> and 14mm<sup>2</sup> in mid LM with good apposition and expansion, no stent edge dissection. The final results showed the coronary vessel was having TIMI flow 3 and no residual stenosis.

**Conclusion** IVUS guidance in LM-LAD PCI give us a lot of information of the coronary vessel we were working and help us for giving better judgments in doing the PCI strategy and minimize the complications afterwards.

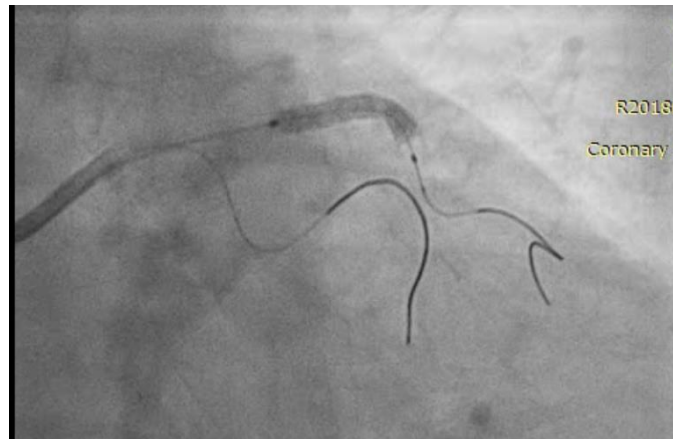
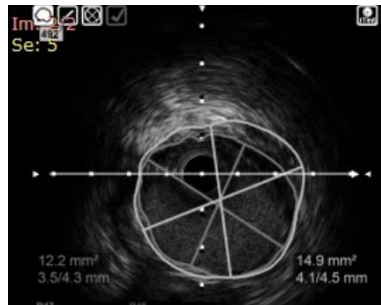
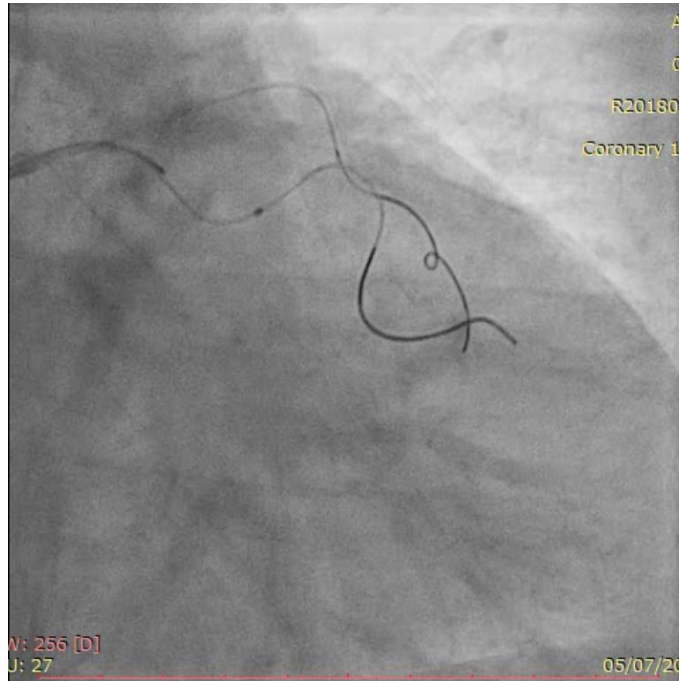
**Keywords** : Intravascular Ultrasound, Percutaneous Coronary Intervention, Left Main, Left Anterior Descending artery

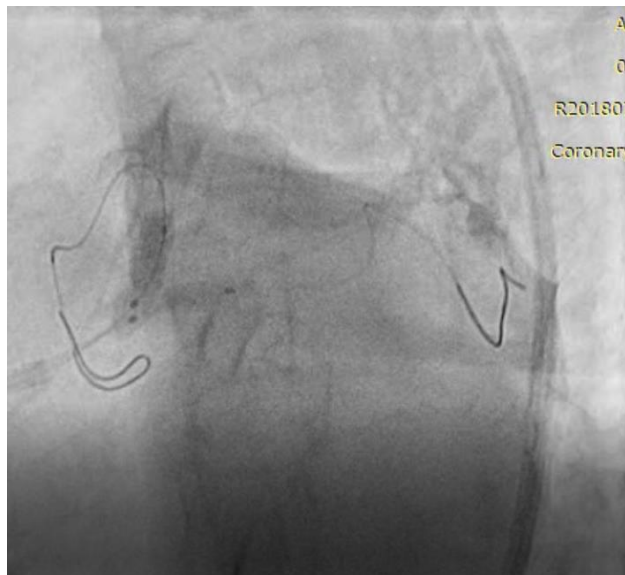














## **FRACTURED BURR IN THE LEFT ANTERIOR DESCENDING ARTERY**

### **A CASE REPORT**

**Muhammad Barri Fahmi, Jack Tan, Yeo Kung Kheong**

#### **ABSTRACT**

Rotational atherectomy is a widely used modality in percutaneous coronary revascularization, especially for heavily calcified coronary arteries (1),(2). Due to the unique mechanism of rotational atherectomy, there have been reports of unusual complications, including fracture of coronary wire, guidewire bias, coronary spasm leading to myocardial infarction, and fracture of the drive shaft causing acute ischemia (3),(4),(5),(6). We provide a case reported of fractured of an atherectomy burr in the left anterior descending artery (LAD) and a technique for its removal.

We are describing a case where an elective Percutaneous Coronary Intervention of the Left Anterior Descending using Rotational Atherectomy had rotational burr entrapment. The device was then successfully retrieved using a mother and child catheter.

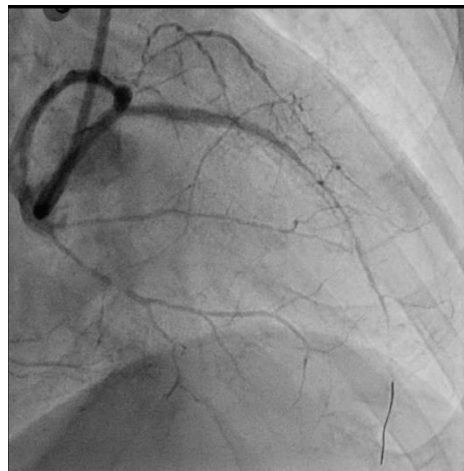
A 55 years old man with triple vessel disease, in-stent restenosis (ISR) in left anterior descending (LAD) artery and end stage renal failure on hemodialysis underwent elective percutaneous coronary intervention (PCI). Previous PCI attempt to the LAD was unsuccessful because of the calcified lesion. After successfully wiring and crossing the LAD lesion, we then used sequential rotational atherectomy from 1.25mm burr to 2.00mm burr. However, we were unable to retrieve the 1.25mm burr. The burr then was fractured. Fortunately the burr was successful extracted using a mother and child catheter.

## INTRODUCTION

Rotational atherectomy is a widely used modality in percutaneous coronary revascularization, especially for heavily calcified coronary arteries (1),(2). Due to the unique mechanism of rotational atherectomy, there have been reports of unusual complications, including fracture of coronary wire, guidewire bias, coronary spasm leading to myocardial infarction, and fracture of the drive shaft causing acute ischemia (3),(4),(5),(6). We provide a case reported of fractured of an atherectomy burr in the left anterior descending artery (LAD) and a technique for its removal.

## CASE REPORT

A 55 years old man with triple vessel disease, in-stent restenosis (ISR) in left anterior descending (LAD) artery and end stage renal failure on hemodialysis underwent elective percutaneous coronary intervention (PCI). Previous PCI attempt to the LAD was unsuccessful because of the calcified lesion. This patient cannot go for coronary artery bypass surgery (CABG) because of his renal disease. The coronary angiography showed diffusely diseased and calcified left anterior descending (LAD) artery with ISR from mid to distal LAD (**Figure 1**).



**Figure 1.** Diffused and calcified LAD.

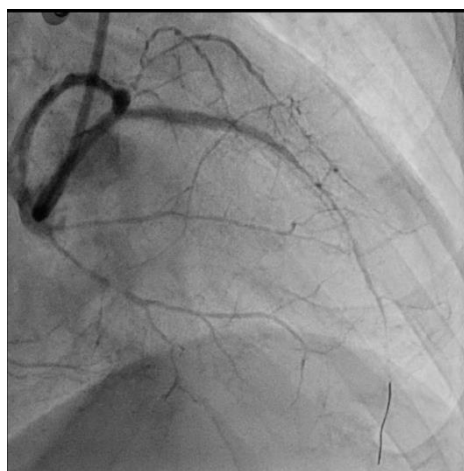
An 8 Fr guiding catheter was chosen and placed in the ostium of the left main artery. Since this patient had unsuccessful PCI and was known to have a significant ISR to mid and distal LAD, we decided to perform rotational atherectomy from the start. We used an EBU 3.5 guide and

femoral access for better support and easier stents delivery. Then, we did a sequential rotational atherectomy using 1.25mm, 1.75mm, and 2mm burr to mid LAD ISR with 150.000 RPM. (**Figure 2**). After several passes, we eventually managed to crack open the mid LAD disease.

Next, we advance the system in Dyna Glide mode to the distal LAD and used a 1.25mm burr with 150.000 RPM (**Figure 3**). However, after several passes, we cannot pull back the burr. Eventually, the burr was fractured and left in the LAD (**Figure 4 and 5**).



**Figure 2.** Rotational atherectomy with 1.25mm burr to mid LAD.



**Figure 3.** Rotational atherectomy to distal LAD with 1.25mm burr.

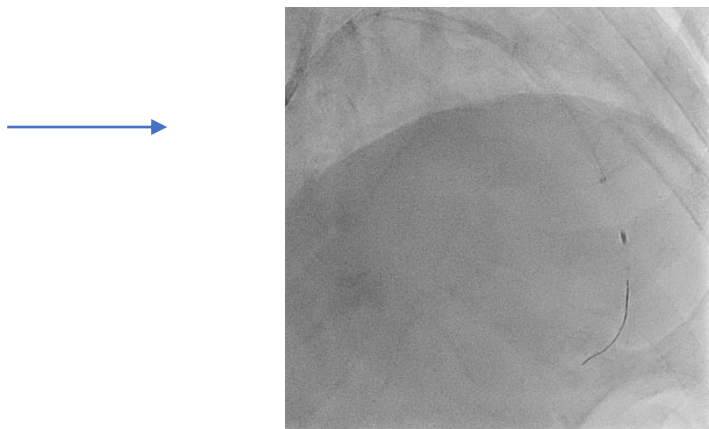


**Figure 4.** Fractured rotablator burr (arrowhead) and the rotablator drive shaft (arrow).

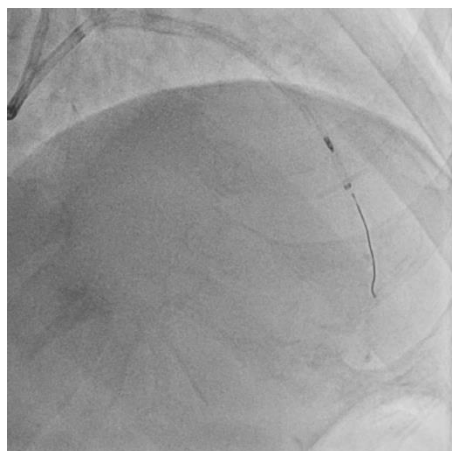


**Figure 5.** Fractured rotablator burr left in the distal LAD.

We then inserted another wire and a Guideliner (mother and child catheter) into the distal LAD lesion to remove the fractured rotablator burr using a counter-traction technique (**Figure 6, 7, and 8**). The burr was successfully removed and the PCI procedure was continued. **Figure 9** showed the fractured rotablator burr.



**Figure 6.** Guideliner catheter (arrow) is used to extract the fractured rotablator burr.



**Figure 7.** The rotablator burr is shown to be encased inside the Guideliner catheter.





**Figure 8.** The burr was successfully removed.



**Figure 9.** The 1.25mm rotator burr (arrow head) and rotator driveshaft (arrow).

## Discussion

Entrapment or fractured burr within heavily calcified lesions is a recognized complications(7), which usually necessitates sternotomy and open surgical intervention to retrieve the trapped burr. In some cases, the trapped burr can be retrieved using simple traction. But, in this case, it would be difficult because the burr entrapment is in the distal LAD which would make

pulling the wire more hazardous since we could have fractured the wire. Cunnington et.al used a counter-traction technique using the Guideliner catheter which successfully removed the entrapped burr without the need for surgery when simple traction alone had been ineffective(7). By simultaneous traction on the burr shaft and counter-traction on the child catheter, the catheter tip can act as a wedge between the burr and the surrounding plaque, which may exert a larger and more direct pulling force to retrieve the burr. Furthermore, the child catheter may protect the proximal vessel on coronary tree and prevent the burr from dissecting the coronary artery.(7)(8)

## REFERENCES

1. Topol EJ, Leya F, Pinkerton CA, Whitlow PL, Hofling B, Simonton CA, et al. A comparison of directional atherectomy with coronary angioplasty in patients with coronary artery disease. The CAVEAT Study Group. *N Engl J Med.* 1993;329(4):221–7.
2. Brown DL, George CJ, Steenkiste AR, Cowley MJ, Leon MB, Cleman MW, et al. High-speed rotational atherectomy of human coronary stenoses: Acute and one-year outcomes from the New Approaches to Coronary Intervention (NACI) registry. In: *American Journal of Cardiology.* 1997.
3. Woodfield SL, Lopez A, Heuser RR. Fracture of coronary guidewire during rotational atherectomy with coronary perforation and tamponade. *Cathet Cardiovasc Diagn.* 1998;44(2):220–3.
4. Reisman M, Harms V. Guidewire bias: potential source of complications with rotational atherectomy. *Cathet Cardiovasc Diagn.* 1996;64.
5. Matsui H, Yasui S, Saito S. Complications of percutaneous transluminal coronary rotational ablation in Kawasaki disease. *Pediatr Cardiol.* 2000;21(5):500–1.
6. Jain D, Kurowski V, Degenhardt M, Katus HA, Richardt G. A rare, unreported complication during coronary rotational atherectomy. *J Invasive Cardiol.* 2000;12(8):428–30.
7. Cunnington M, Egred M. GuideLiner, a child-in-a-mother catheter for successful retrieval of an entrapped rotablator burr. *Catheter Cardiovasc Interv.* 2012;79(2):271–3.
8. Lin CP, Wang JH, Lee WL, Ku PM, Yin WH, Ten-Ping T, et al. Mechanism and management of burr entrapment: A nightmare of interventional cardiologists. In: *Journal of Geriatric Cardiology.* 2013. p. 230–4.



## **CATHETER-INDUCED RIGHT CORONARY ARTERY DISSECTION DURING ANGIOGRAPHY :**

### **WHAT SHOULD WE DO ?**

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#### **Abstract**

*Catheter-induced coronary artery dissection is uncommon complication of cardiac catheterization. It results from mechanical injury to the arterial wall. This could be treat by conservative therapy, percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) surgery. We report a catheter-induced coronary artery dissection on a 68-year old woman with stable angina pectoris during coronary angiography and its management with PCI.*

#### **Background**

Although an uncommon complication of cardiac catheterization with reported incidence of less than 0.1%, catheter-induced coronary artery dissection can be life-threatening<sup>1</sup>. It depend on extention of dissection flap and the luminal obstruction. Catheter-induced coronary artery dissection results from mechanical injury to the arterial wall during catheter or wire manipulation, passage or deployment of an interventional device, forceful injection of contrast medium, or balloon dilatation or stenting.<sup>2,3,4</sup> This complication could be happened to everyone and not all of us could realized it. The management were conservative therapy, CABG surgery if the patient were stable and had multivessel disease and undergo PCI if patient were unstable. We present an illustrative case report of the catheter-induced RCA dissection which was treated with deployment of stents.

## Case illustration

We reported a 68-year old woman with angina pectoris since 6 months ago, increased with activity and decreased with rest, sometime she felt heavy in the chest, and radiates to neck. Risk factor of coronary artery disease were age and hypertension.

The physical examination was unremarkable, laboratory results was within normal limit. Electrocardiography revealed left axis deviation and T wave inversion V1-V5. Chest xray revealed cardiomegali with CTR was 55%.

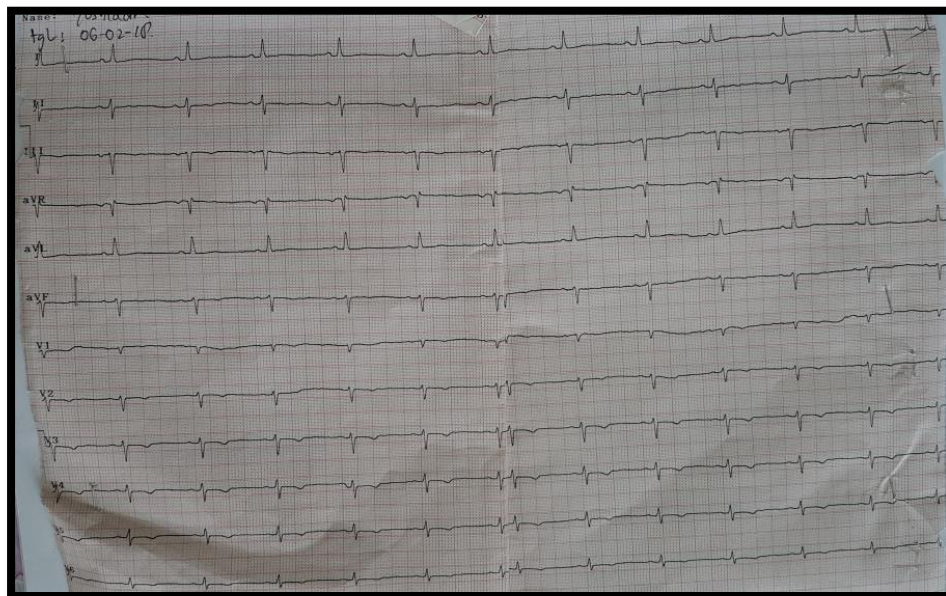


Figure 1. Sinus rhythm 70 x/m, left axis deviation, P wave 0,08", PR interval 0,16" QRS duration 0,08", T wave inversion V1-V5

The patient was admitted with diagnosis of stable angina pectoris CCS III, atherosclerotic heart disease and hypertension heart disease. Patient was given clopidogrel 1x75 mg, acetosal 1x100 mg, bisoprolol 1x5 mg and lansoprazol 1x30 mg.

Coronary angiography was started with a 6 F Judkins Right (JR) 3,5 diagnostic catheter. There was no forceful manipulation of the catheter and easy cannulation was done. After engaging the RCA ostium, there was no damping or ventriculization of pressure. The first angiogram from

the left anterior oblique (LAO) view revealed a catheter induced dissection from ostial to distal RCA. The patient was suddenly hemodynamically and symptomatically unstable. The patient complained of severe chest pain and there was ST-segment elevation in the inferior leads of the electrocardiogram. Rapid measures were prepared to fix that dissection before spreading retrograde into the ascending aorta. The diagnostic catheter was immediately withdrawn and switch to 6 Fr Judkins Right 3,5 (JR 3,5) guiding catheter and soft-tip guidewire was rapidly inserted. Guidewire was easy delivery to the distal end of the RCA and still inside the true lumen. Dissected segment was about more than 30 mm long with an ostial inlet and distally sited exit just before distal bifurcation of RCA. The inlet segment was fixed by 3.0 x 38 mm Everolimus eluting stent, it was deployed at 14 atm for 5 seconds. Dissection was nicely restoration of TIMI III flow and myocardial blush grade III. The patient's chest pain was resolved and ECG changes improved. The patient was finally discharged on the second day on aspirin and ticagrelor along with routine post-angioplasty medication. The coronary angiography was repeated one month later. From the coronary angiography we found the stent was patent on right coronary artery and other segment of coroner was normal.



A

B

C

Figure 2. (A&B) Diagnostic angiogram demonstrates a RCA dissection from ostear to distal (C) Insertion soft tip guidewire to RCA distal.

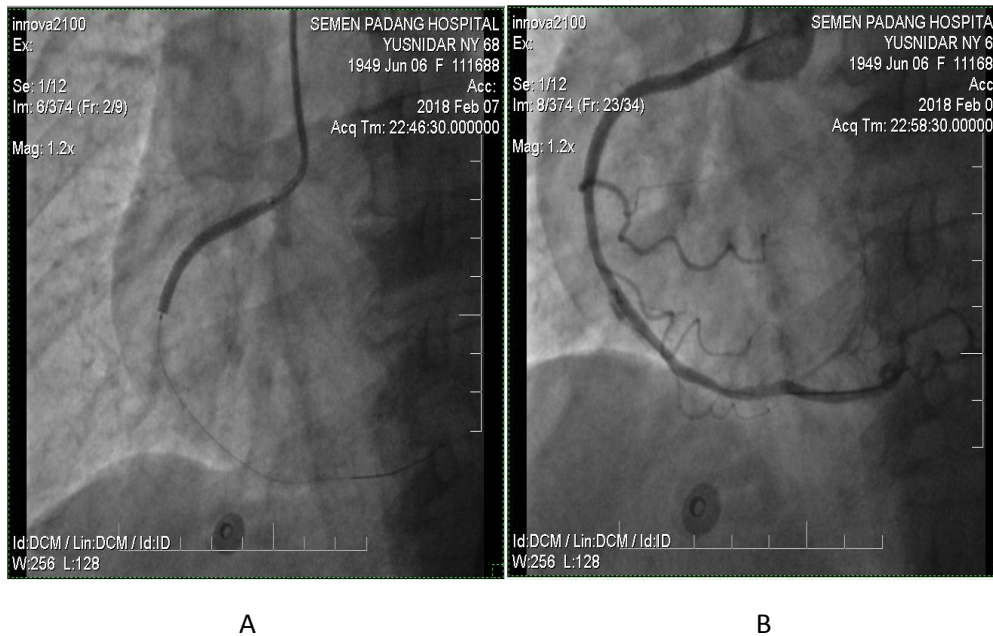


Figure 3. (A) Placement of stent in the RCA ostial (B) Right coronary angiogram in LAO view after deploying the stent

## Discussion

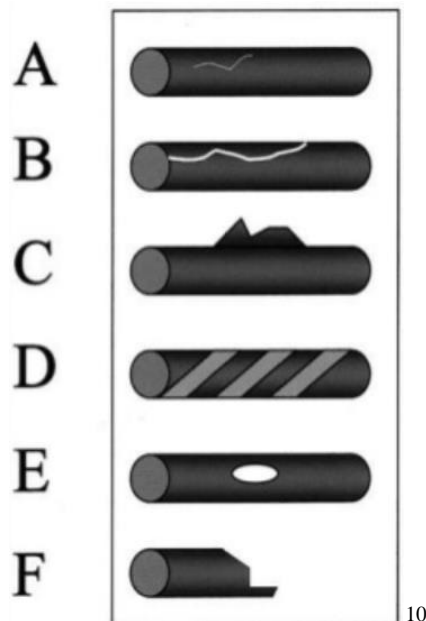
Goldstein et al<sup>5</sup> reported that 89% of dissections involve the right side of coroner and other 11% was on the left side. The angle that forms from left coronary artery and ascending aorta is more acute (range, 20–55 degree) than right coronary artery (range, 60–88 degree). Because of that left coronary artery can provide better approach for catheterization due to their coaxial alignment. The diameter of left coronary artery ostium was larger than the right, and also the left coronary artery has a greater number of smooth muscle cells (type I collagen), which could made the right coronary artery ostium is less resistant to traction and easily to get retrogressive aortic dissection.<sup>6</sup>

Patients with ostial coronary artery stenosis, hypertension, Marfan syndrome, congenitally unicuspid and bicuspid aortic valves, and cystic medial necrosis have been reported to be at higher risk of dissection.<sup>7</sup> In hypertensive patients there are increased shear stresses on aortic root walls which make it relatively movable structure that may affect the position of the catheter while it is engaged inside the coronary artery predisposing to dissection.

Coronary artery dissection should be measured rapidly. This can be seen from the patient's hemodynamic that suddenly unstable. Also the branches of coronary blood vessels which are not visible on coronary angiography as well as coronary flow that was not smooth. We can also see the position of a non-coaxial catheter tip on ostium coroner.

Definition of the type of dissection is also important. The National Heart, Lung, and Blood Institute classifies coronary dissections into 6 types (A–F) based upon their angiographic appearance :<sup>9</sup>

- A: Minor radiolucent areas with little or no persistence of contrast.
- B: Parallel tracts or a double lumen with little or no persistence of contrast.
- C: Contrast outside the coronary lumen with persistence of contrast.
- D: Spiral dissection with filling defects.
- E: Persistent filling defects in lumen.
- F: Total occlusion without distal flow.



Treatment of coronary artery dissection depend on the patency of distal vessel and the extent of propagation of the dissection. Conservative therapy, bailout stent implantation, and CABG are strategies for the treatment.<sup>1,4,8</sup>

If there is compromise to the distal artery bed, such as acute closure of the artery, urgent revascularization is mandated to prevent infarction of that myocardial territory.<sup>11</sup> Most operators would advocate that antegrade dissections be treated with PCI as soon as they are recognized. Soft-tip wires should be used to carefully attempt to access the true lumen and contrast should be injected through an over-the-wire balloon to confirm location in the true lumen. If the initial attempt fails and enters the false lumen, another soft-tip wire should be carefully manipulated into the true lumen.<sup>4</sup> If available and if tolerated by the patient, IVUS can help confirm the correct position of the wire in the true lumen, determine the extension of the dissection, and guide stent sizing.<sup>12</sup>

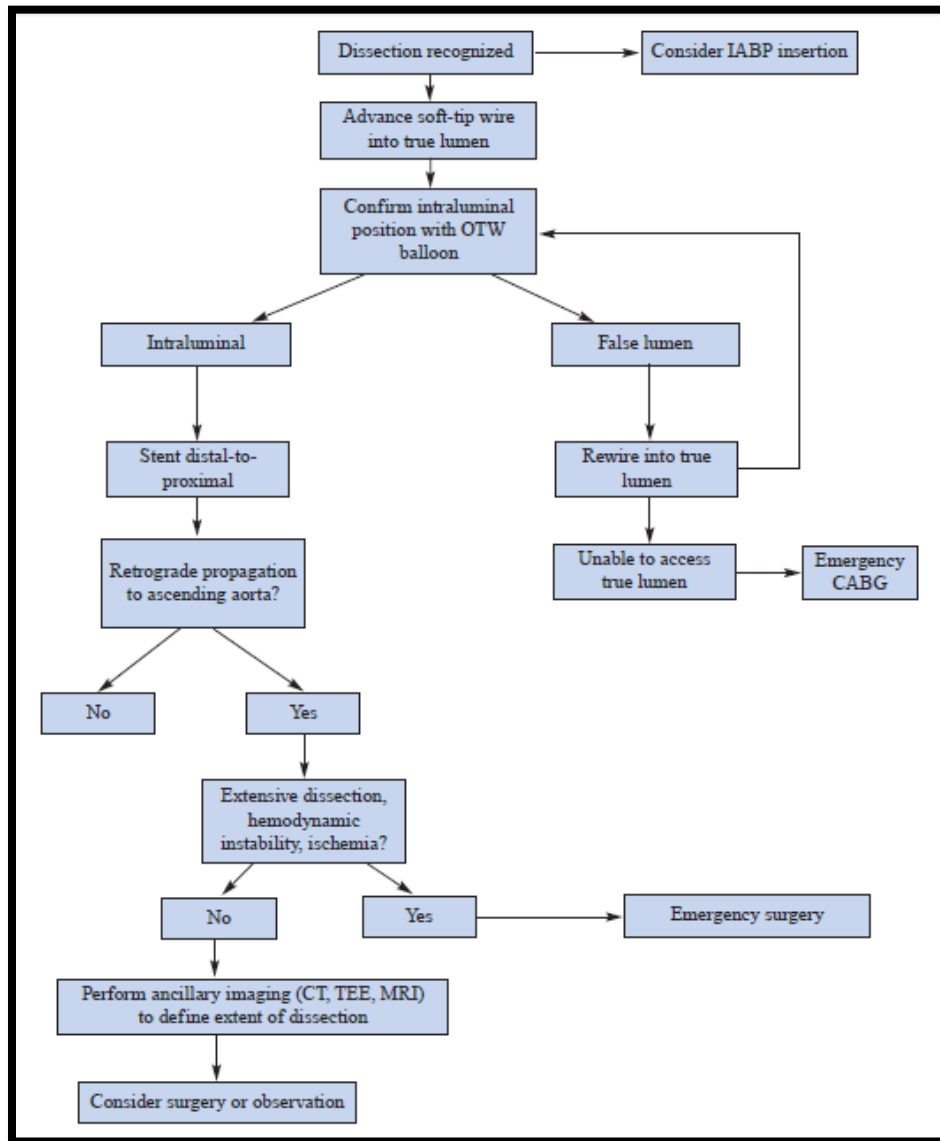




Figure 4. Algorithm for risk assessment and treatment of guide catheter-induced coronary artery dissection<sup>4</sup>

Retrograde dissection involving the aorta should be assessed on clinical grounds and by urgent transesophageal echocardiography in the catheterization laboratory or by urgent computed tomography scan. If there is extensive dissection or if there is hemodynamic instability, urgent surgery is the treatment of choice.<sup>4</sup>

Classification system from retrograde dissection :<sup>13</sup>

- Class I: the contrast staining involves only the coronary cusp;
- Class II: contrast extends up the aortic wall < 40 mm;
- Class III: contrast extends > 40 mm up the aortic wall

Using appropriately sized and shaped catheters to avoid the contrast injection being directed at a plaque are recommended. Initial contrast injections should not be forceful until correct coaxial alignment of the catheter has been demonstrated.<sup>4</sup>

## Conclusion

We performed coronary angiography on right coronary artery using Judkin Right 3,5 diagnostic catheter. Catheter-induced coronary artery dissection happened as complication. We successfully managed the patient with inserted 1 DES to ostial RCA to fixed the inlet segment of dissection.

## REFERENCES

1. Eshtehardi P, Adorjan P, Togni M, Tevaearai H, Vogel R, Seiler C, et al. Iatrogenic left main coronary artery dissection: incidence, classification, management, and long-term follow-up. *Am Heart J* 2010;159:1147–53.
2. Jain D, Kurowski V, Katus HA, Richardt G. Catheter-induced dissection of the left main coronary artery, the nemesis of an invasive cardiologist. *Zeitschrift fur Kardiologie* 2002;91:840.
3. Tomassini F, Gagnor A, Varbella F. Perforation of the sinus of Valsalva by guiding catheter during the percutaneous coronary intervention via the right transradial approach: a very unusual complication. *Catheter Cardiovasc Interv* 2011;78:888–91.
4. Boyle AJ, Chan M, Dib J, Resar J. Catheter-Induced Coronary Artery Dissection: Risk Factors, Prevention and Management. *J Invasive Cardiol* 2006;18:500–503.



5. Goldstein JA, Casserly IP, Katsiyannis WT, Lasala JM, Taniuchi M. Aortocoronary dissections complicating a percutaneous coronary intervention. *J Invasive Cardiol* 2003;15:89-92.
6. Lopez-Minguez JR, Climent V, Yen-Ho S. Structural features of the sinus of valsalva and the proximal portion of the coronary arteries : their relevance to retrograde aorto-coronary dissection. *Rev Esp Cardiol* 2006;59(7):696–702.
7. Shafey WE. Catheter-induced dissection of a normal right coronary artery: Reappraisal of the underlying mechanisms. *The Egyptian Heart Journal* 2016;68: 137–139.
8. Sung LC, Wang JH. A Double-wire Technique for Dealing with Catheter-induced Right Coronary Artery Dissection Extending to the Aortic Root. *Tzu Chi Med J* 2008;20;322-26
9. Mikail Y, Kutay T, Mehmet GK, Nihat K. Aortic and Coronary Artery Dissection During Percutaneous Coronary Intervention: A Case Report and Review Article. *Clin. Cardiol* 2011; 34, 5, 283–286.
10. Adel A, Tito K, Olivier, Christan R, Gregoire G, Eric E. Complications of CTO Intervention. Managing perforation and dissection. *Cardiac Intervention Today* 2009 ; 1;54-57.
11. Artemiou P, Lukacin S, Kirsch P, Ignac J, Bily B, Tohatyova A, Rabajdova MB, Sabol F. Surgical Treatment of a Catheter-Induced Iatrogenic Dissection of the Right Coronary Artery following Cardiac Catheterization. *J Teh Univ Heart Ctr* 2016;11(1):30-33.
- 12 David B, Aram N. Iatrogenic right coronary artery dissection caused by diagnostic transradial cardiac catheterization. *Clinical Case Reports* 2017; 5(8): 1234–1237.
13. Dunning DW, Kahn JK, Hawkins ET, O’Neill WW. Iatrogenic coronary artery dissections extending into and involving the aortic root. *Catheter Cardiovasc Interv* 2000;51:387-393.



## **RECURRENT ANGINA AFTER PRIMARY PCI IN STEMI**

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A case of primary percutaneous coronary intervention (PCI) is shown in female patients with an ST-segment myocardial infarction. percutaneous coronary intervention (PCI) for left anterior descending artery (LAD) was done in outside hospital. 2 weeks later she came to our center with recurrent chest pain. It turned out that it was wrong target vessel revascularization.

## **RADIAL ARTERY OCCLUSION AFTER TRANSRADIAL CORONARY INTERVENTION**

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Tangerang General Hospital**

### **Background**

Following the introduction of transradial coronary angiography by Campeau et al. in 1989 (1), Kiemeneij et al. were the first to document coronary angioplasty and stenting via the transradial approach (TRA) in 1993 (2). An increasing number of interventional cardiologists are performing percutaneous interventions through the radial artery (3). Furthermore, multiple studies have demonstrated significant benefit with TRA, due to its relatively lower potential for access site bleeding and high patient comfort/satisfaction, while maintaining an overall high procedural success rate (4-5). Radial artery occlusion (RAO) is the most common significant complication after transradial catheterization, with incidence varying between 1% and 10% (6-7). Although RAO is rarely accompanied by hand ischemia, it is an important complication because it prohibits future transradial access and radial artery utilization as a conduit for coronary artery bypass grafting or arteriovenous fistula formation. We presented a case report of radial artery occlusion following transradial coronary intervention.

### **Case Report**

A 51 year old man come to the emergency room because typical increasing chest pain over the few days. Patient was previously diagnosed as coronary artery disease 2VD and already undergone Percutaneous Coronary Intervention with one stent in LAD 3 months ago. Physical examination was unremarkable. ECG showed WPW pattern with right posteroseptal accessory pathway. Patient then diagnosed Unstable angina pectoris and hospitalized with medication ASA 1x 80 mg, Ticagrelor 2x 90 mg, Bisoprolol 1x 2,5 mg, Lisinopril 1x 10 mg, simvastatin 1x 20 mg, ISDN 3x 5 mg and given Unfractionated Heparin i.v. Coronary angiography was done the next day showed patent stent in LAD, 80% stenosis in ostial LCx and 80% stenosis in OM2. PCI was done and put 1 stent in OM2 and ostial LCx. 3 days after the intervention patient complain heavily chest pain and swollen right hand with the suspicion of acute thrombosis and acute limb ischemia. Angiography was done the same day showed total occlusion in OM2 right before the implanted stent. PCI was done by implanting another stent in OM2 overlap with the precious stent. Radial arteriography showed total occlusion in radial artery. Wiring and balloon dilatation in the radial artery for several time. After the dilatation, there is good flow in radial artery. Patient did not feel any pain in his hand and swollen hand was resolve after a few days. Patient sent home with good condition.

### **Conclusion**

We reported a case of radial artery occlusion after transradial coronary intervention. Intervention was done in right radial artery and occlusion can be resolved with good condition.

### **References**



1. Campeau L. Percutaneous radial artery approach for coronary angiography. *Cathet Cardiovasc Diagn* 1989;16:3-7.
2. Kiemeneij F, Laarman GJ, de Melker E. Transradial artery coronary angioplasty. *Am Heart J* 1995;129:1-7.
3. Rao SV, Ou FS, Wang TY, et al. Trends in the prevalence and outcomes of radial and femoral approaches to percutaneous coronary intervention: a report from the National Cardiovascular Data Registry. *JACC Cardiovasc Interv* 2008;1:379-86.
4. Doyle BJ, Rihal CS, Gostineau DA, et al. Bleeding, blood transfusion, and increased mortality after percutaneous coronary intervention: implications for contemporary practice. *J Am Coll Cardiol* 2009;53:2019-27.
5. Jolly SS, Amlani S, Hamon M, et al. Radial versus femoral access for coronary angiography or intervention and the impact on major bleeding and ischemic events: a systematic review and meta-analysis of randomized trials. *Am Heart J* 2009;157:132-40.
6. Kotowycz MA, Džavík V. Radial artery patency after transradial catheterization. *Circ Cardiovasc Interv* 2012;5:127-33.
7. Stella PR, Kiemeneij F, Laarman GJ, et al. Incidence and outcome of radial artery occlusion following transradial artery coronary angioplasty. *Cathet Cardiovasc Diagn* 1997;40:156-8.

## TECHNIQUE AND DEVICE SELECTION FOR RETROGRADE CTO PCI THROUGH IPSILATERAL COLLATERAL CHANNELS : IF YOU WANT PEACE, PREPARE FOR THE WAR

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**Introduction:** Chronic total occlusion (CTO) of a coronary artery accounts for 20%-30% of cases during diagnostic angiography. Retrograde recanalization techniques have markedly improved success rates of attempts to open CTO lesion. CTO PCI should be performed within a structured framework with robust procedural planning to maximize procedural success. We describe a case of retrograde recanalization of a distal circumflex artery via an epicardial diagonal collateral channel and discuss the importance of strategic planning before doing procedure.

**Case :** A 58-year-old man presented with exertional angina (Canadian Cardiovascular Society Angina Class II) of 6-month duration. His coronary risk factors were hypertension and smoking. The physical examination was unremarkable. The initial electrocardiogram showed no ST-T Changes. The transthoracic echocardiography showed normal LV systolic function (EF 58%) with hypokinetic of the inferior and inferolateral wall. He had undergone stenting in the RCA and failed antegrade approach of the LCX CTO lesion 2 months prior. Diagnostic coronary angiography demonstrated no significant stenosis in the left main and LAD, and CTO of the distal LCx. The angiographic characterization was poorly identified proximal cap, no evident of calcification, bending <45 degrees within the CTO segment, lesion length  $\geq$  20mm, and good interventional collaterals. The distal LCx was filling mainly via an ipsilateral epicardial collateral from diagonal. Elective PCI of the LCx CTO was arranged with plans for the retrograde wire escalation technique that was considered ideal since the previous attempt with antegrade approach failed, long lesion and origin of the CTO was not obvious. There was long and tortuous epicardial collateral circulation from diagonal so we need short good support guiding catheter and 150mm microcatheter support. The LCA was engaged with a 7 French XB 3.5 shortened (~90cm long) guide catheter, and anticoagulation was achieved with unfractionated heparin. The epicardial diagonal collateral branch was wired with a Sion Blue wire with 130cm Finewire microcatheter support. Hopefully, we can cross the CTO lesion retrogradely and use 130cm microcatheter for wire exchange and got antegrade access with tip-in technique. The Sion blue wire crossed the collateral vessel retrogradely into the distal cap of the LCX CTO lesion. Retrograde wire escalation technique was performed with Fielder XT-A, Gaia 2<sup>nd</sup> and recanalization with through lumen puncture was successful with GW Gaia 3<sup>rd</sup>. Antegrade access through kissing wire technique failed due calcified portion of the proximal CTO cap. The retrograde Gaia 3<sup>rd</sup> guidewire introduction into the 7 Fr XB 3,5 guiding catheter was unsuccessful due to its limited maneuverability through the lumen. Therefore there was no other option than to reattempt the retrograde recanalization with the use of 150cm Finewire microcatheter which increase contrast



and radiation exposure. Retrograde recanalization was successful with the use GW Gaia 3<sup>rd</sup>. Advancing the microcatheter through the CTO Lesion retrogradely made it possible to exchange the GW to Floppy to be introduced to 6 French XB 3.5 guiding catheter. Tip-in technique was performed to secure the antegrade access. We then performed the tip-in technique by advancing a 130cm Finecross microcatheter in the XB 3.5 antegrade guide catheter and inserting it over the retrograde wire. We were then able to advance the Finecross antegradely on the retrograde guidewire through the occluded segment to the distal cap. Once the antegrade GW was successfully introduced across the CTO lesion, was predilated and stented with regular manner. The LCx was then stented with 2.25 x 23 mm and 2.50 x 33 mm Xience Prime stents and , postdilated with a 2.5 mm non-compliant balloon with good angiographic result. The patient had no postprocedural complications but received excessive 390ml of Omnipaque contrast with 9952 mGy radiation dose and prolonged fluoroscopy time 1 hour 17 minutes.

**Conclusion :** We describe a successful CTO through epicardial collateral with retrograde true lumen puncture followed by tip in technique after failed antegrade approached. The right selection of devices and strategy may shorten procedure time and radiation. In this case, selecting a short 130 cm microcatheter despite shortening the guiding catheter, limit the strategic option for achieving antegrade access resulting in longer duration, increase amount of contrast and radiation.

## THE ROLE OF SELF EXPANDABLE STENT FOR TREATING LEFT MAIN COMPRESSION DUE TO PULMONARY HYPERTENSION

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The Prevalance of Left Main Compression (LMCo) in patient with Pulmonary Hypertension (PH) and angina is high. The best management is still controversial. Advancement in percutaneous coronary Intervention (PCI) opens new avenues for treating those patients who usually have prohibitive surgical risk. LM diameter variations due to compression of MPA can be challanges in terms of stent sizing.

A 37 yo lady, without any risk factor of CAD had multiple episode of chest pain, patient was diagnosed with ASD with PH before. RHC showed mPAP 49 mmHg Qp:Qs 1,6 Estimated PVR 12,9 Wood and CT showed LM Ostial Compression (70 % stenosis) by enlarged MPA. Coronary Angiogram Confirmed LM ostial stenosis 70 % but the FFR result was non significant. Under Follow up Patient still had multiple episode of chest pain, Stress test was performed and showed positive test. Finally decided to proceded LM stenting with self expandable and succesfully stent implantation. Patient clinically improved under follow up, However after 2 months implantation patient still got intermitent episode of chest pain. Repeat Coronary Angiogram showed the stent was migration from initial position and proximal site protrude to the Aorta. We decided to refer patient for surgery.

Self-Expandable (SE) stent have better anatomical fit to the vessel even with diameter variations and it can adapt to changes in vessel size over time. Initially it is consider as good choice for LMCo because of dynamic changes vessel, however after succesfully implantation, the stent was migrate. Low radial strength and flexibility of SE stent, low calcium distribution inside the vessel, continuously compression of enlarged PH might be as contributing factor to squeeze the stent out.

Keyword: LM Compression, Pulmonary Hypertension, Self Expandable Stent





## **HOW TO DEAL WITH BALLOON UNCROSSABLE CTO LESION? WHAT CAN WE DO?**

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**Introduction :** Percutaneous coronary intervention (PCI) of chronic total occlusion (CTO) presents challenges and potential complications. The two most common failure modes are inability to cross the lesion with a guidewire and the second cause of failure is inability to cross the CTO with a balloon (“balloon-uncrossable” CTO). This can occur despite the successful placement of a guidewire in the distal true lumen. Several technique have been described to assist crossing of “balloon-uncrossable” CTO.

**Case :** A 49 years-old woman came to our catheterization for elective PCI. She had history of stable angina pectoris CCS II. Risk factor was hypertension. Patient with hepatitis B. Coronary angiography revealed CTO at proximal LAD. Guiding catheter XB 3,5/6F and fielder XT-A can not crossing the lesion. Excalation wire with Gaia third and backup microcatheter successfully crossing the CTO lesion but unfortunately ballon 2.0x20 mm can not cross the lesion. We decided to use smaller ballon 1,25x15 mm and inflate with high pressure several times (balloon assist microdissection) at mid part and put ballon 2.0x20mm at diagonal branch as anchor (balloon anchoring technique) to give more support. Stent was implanted at mid and proksimal part with good result.

**Conclusion :** CTO PCI often give challenges to operator as each case is unique. The two most common of CTO failure is inability to cross the CTO with ballon despite of successful wire positioning in the distal true lumen (balloon uncrossable). Ballon assist microdissection and ballon anchoring technique are simpe, inexpensive and safe technique that can be applied to enhanced the likelihood of succesful ballon crossing the CTO lesion.

**Keyword :** *Chronic total occlusion, ballon anchoring, balloon assist microdissection.*

## WHO SAYS A MULTIPURPOSE GUIDING CATHETER CAN'T GIVE AN ADEQUATE SUPPORT FOR COMPLEX PCI ?

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### Introduction:

Anomalous aortic origin of coronary arteries are reported to be 0.6-1.2% in patient who are referred for coronary angiography (1). Guiding catheter selection is the most important step for any PCI, but more so for anomalous coronary arteries. Selection of a guide catheter should be based on configuration of the ostium, dimensions of the aortic root, location of the origin, and type of the lesion. Percutaneous coronary intervention of a low take off in origin is technically challenging and there is a lack of adequate backup support for the guiding catheter. Here we describe the use of Multipurpose guiding catheter for an anomalous right coronary artery with low take off and proximal angulated right coronary artery.

**Case:** A 70 years old male was came to hospital with stable coronary artery disease. Patient had long standing hypertension and dyslipidemia, and had attempted PCI for left coronary artery one month ago. Coronary angiogram via right radial artery showed normal Left Main, stent patent LAD, normal small caliber LCx, low take off in origin, proximal angulated vessel, 70 – 80 % multiple stenosis of proximal – mid part in RCA. We cannulated the RCA with 5F MP1 guide catheter and found difficulty to engages the RCA.. A wire was passed distally in the RCA, the lesion was predilated in proximal – mid part using a 2,5x 15 mm semi compliance balloon at 14 atm. A drug eluting stent (DES) could not be delivered to the mid RCA due to resistance attributed to the angulated and calcified in proximal of RCA. The proximal RCA lesion was dilated by 3,5x15 mm non-compliance balloon at 14 ATM Adequate cannulation and support was achieved with deep seating catheter inside sinus Valsava. A 3.5 mm × 22 mm drug-eluting Stent can be placed in the mid RCA at 14 atm. Delivery of another DES was attempted but it failed . The proximal-osteal part was dilated by 3,5x15 mm non-compliance balloon at 16 ATM. By Performing deep seating and deep intubation, finally a 3,5 x 28 mm DES was attempted in proximal RCA, overlapping with previous stent., A 3,5x15 mm NC balloon post dilated had been done in osteal at 16 atm. Final result showed a TIMI 3 flow without complication.

**Conclusion:** Guide catheter selection is important for percutaneous coronary intervention (PCI) point of view. In this case, successful PCI of anomalous RCA (low take off) depends on optimal guide catheter seating and support which achieved by using multi purpose catheter.

## MANAGEMENT OF THROMBUS BURDEN IN PRIMARY PERCUTANEOUS CORONARY INTERVENTION : THE ROLE OF DEFERRED STENTING

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**Introduction :** Primary percutaneous coronary intervention (PCI) is the best available reperfusion strategy in patients with acute ST- segment elevation myocardial infarction (STEMI). One of the greatest frustrations of the interventional cardiologist is that restoring flow down an occluded epicardial artery in patients with STEMI does not equate to normalization of downstream microvascular flow. Microvascular obstruction (MVO) is a strong negative prognosticator associated with a higher prevalence of arrhythmias, pericardial effusion, tamponade, early congestive heart failure, adverse left ventricular remodelling, readmissions for heart failure and mortality.

**Case:** First case, 58 year-old man referred from district hospital with chief complaint chest pain since 4 hours prior to admission and with stable condition. The risk factors were hypertension and smoker. ECG in emergency showed sinus rhythm with elevation of ST-segment in lead II, III, aVF, V7-9 (inferoposterior STEMI). Primary PCI with right radial artery approach was started. The culprit lesion was LCx artery with dominant, ectasis ostial until proximal, total occlusion after OM2. We decided to use the AL-1/6F catheter for stable back-up support from the beginning. Double wiring with soft wire to distal LCx and hard wire to OM2 because difficult to crossing lesion. Predilatation with balloon 3.0 x 15 mm several time and the result TIMI 3 flow but still were seen high thrombus burden. GIIb/IIIa was administered and continued with heparinization. Evaluation the procedure, 3 days later patient transfer to cath lab. Angiography showed dominant, ectasis, stenosis 70-80 % in proximal LCx. Wiring with soft wire to distal LCx and predilatation with balloon 4.0 x 10 mm. LCx stented in lesion part using 4.0 x 34 mm DES at 12 atm. Final result showed a TIMI 3 flow with no dissection and thrombus, nor any other periprocedural complication. Second case, 68 year-old man referred from district hospital with chief complaint chest pain since 20 hours prior to admission and with TAVB caused by STEMI Inferior + RV Infarct. The risk factors were hypertension, smoker and DM. ECG in emergency showed elevation of ST-segment in lead II, III, aVF, V3R-V4R with TAVB HR 50x/mnt. Blood pressure was 131/67 mmHg. Patient was inserting TPM before the procedure Primary PCI. The culprit lesion was RCA artery with total occlusion in proximal. Guiding catheter with AL-1/6 F was engaged. Wiring to distal RCA with soft wire. Predilatation with balloon 2.0 x 20 mm several time and the result TIMI 3 flow but still were seen high thrombus burden. Thrombus aspiration with thrombuster was



performed several time. Predilatation was performed again with ballon 2.5 x 20 mm. Stenting was done with DES 2.75 x 30 mm but TIMI 1 flow. GIIb/IIIa was administered intracoronar. Post dilatation with ballon NC 3.0 x 15 mm with 10-14 atm but still TIMI 1-2 flow. The procedure was finished. Patient was continued with GIIb/IIIa and heparinization

**Conclusion:** Deferred stenting in primary PCI is considered if the angiographic features show subjects whom at higher risk of no reflow, such as: floating thrombus; accumulated thrombus proximal to occluded level; persistent dye staining distal to occluded level and infarct related artery with a lumen diameter of  $> 4$  mm

Keyword: Primary PCI, thrombus, deferred stenting, microvascular obstruction



## **STEMI WITH MULTIVESSEL DISEASE AND OSTIAL LM INVOLVEMENT ALSO CARDIOGENIC SHOCK: WHAT SHOULD I DO?**

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### **Abstract**

A 60yo woman was referred from other hospital with presentation of anterolateral STEMI (7h onset). Her risk factors were uncontrol T2DM and dyslipidemia. The blood pressure was low with support of dobutamine 10mcg/kg/minute and norepinephrine 0.1mcg/kg/minute. ECG showed ST elevation in anterolateral wall. Physical examination within normal limit, no acute complication of STEMI was detected. Laboratory showed leucocytosis and high Troponin I. Primary PCI was chosen for this case. Coroangiography showed triple vessel disease with ostial LM involvement. We were planning to revascularize the LAD territory first and elective CABG. One DES stent was implanted in pLAD and no thrombus suction device was used. Final angiography showed TIMI 3 Flow in LAD territory. Then, patient was transferred to ICCU. Day one after primary PCI, patient was suffered severe dyspnea with presentation of acute lung edema and oliguria also acute kidney injury and non-sustained VT. Discussion with heart team (2 senior interventional cardiologist, 1 electrophysiologist and cardiac surgeon) was done, with final decision of elective CABG with no IABP needed and control the comorbidities. Patient was died day one after primary PCI.

***Keywords: STEMI, multivessel disease, ostial LM, cardiogenic shock***

## DEALING WITH CHRONIC TOTAL OCCLUSION (CTO) BY SIDE-BRANCH TECHNIQUE OF INTRAVASCULAR ULTRASOUND (IVUS) GUIDANCE

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Revascularization of coronary CTO remain has a lot of technical challenges & dilemmas in interventional cardiology. It is associated with lower procedural success rates, increased restenosis and reocclusion compared with non-CTO procedures. Expert opinions stated IVUS has some benefits to overcome difficult cases of CTO. To date, there are no controlled data to support these advance applications, but supported by reports from experienced operators

Reported 2 cases of 50 years old man and 63 years old woman presented with stable angina pectoris, Canadian Classification Score 3. Both of cases have 3 points of J-CTO score, stumpless and adjacent side branch therefore categorized as a very difficult cases to revascularize and associated with a significantly lower success rate because the proper entry point is not always clearly identified and the guidewires easily slip into the side branch . Case one revealed CTO at proximal LCx and failed in previously attempted PCI. Case two revealed CTO at mid LAD with heavy calcification. During the procedure, initially the IVUS catheter was positioned into the side-branch to find the entry point of CTO lesion and then the location of the stumpless occluded lesion was marked by filming the transducer on cine angiography. For case one the stiff wire succeeded to passage into the occlusion stump by indirect guidance of IVUS (without continuous acquisition) and for case two direct on-line guidance of IVUS with continuous acquisition (catheter of IVUS left in side-branch) succed to guide the passage of wire into occlusion stump. Both of CTO lesions of these cases could be crossed by Gaia second wires supported with microcatheters (Crusade and Finecross). After several predilatations, drug-eluting stents were deployed for both of cases.

IVUS has an important role to define the accurate location of the occluded artery when the CTO has a vague stump (stumpless) and adjacent side branch on diagnostic angiography. Both of direct or indirect IVUS guidance proven beneficial to support engagement of wire into occlusion stump.

**Keywords :** CTO, IVUS, side-branch, stumpless

**CORONARY ARTERY DISSECTION DUE TO GUIDEWIRE DURING  
CHRONIC TOTAL OCCLUSION INTERVENTION  
WHAT SHOULD WE DO?**

**Interventional Cardiology Fellowship Program**

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**ABSTRACT :** Chronic Total Occlusion (CTO) remain a difficult and challenging lesion subset to treat in interventional cardiology, due to its complication which could be life-threatening. However, an ability to overcome the critical situation in cath-lab is a must. Present case report demonstrated a LAD dissection of a 58-year old CTO patient. The J-CTO score was 2, approached with antegrade technique. After repeated attempts to manipulate the guidewire, we injected a small amount of contrast slowly about 0,2 cc through the microcatheter, and it was confirmed that wire successfully crossed the lesion and entered the true lumen. Following the angiogram, an extravasation of contrast media was showed in proximal portion of LAD suggesting a dissection. For entire coverage of lesion and dissection, drug eluting stent was implanted. The final coronary angiogram demonstrated no residual lumen narrowing with Thrombolysis In Myocardial Infarction 3 flow and no evidence of dissection or small perforation.

Key words : chronic total occlusion, coronary artery dissection, antegrade technique

## PCI IN TREATING LM BIFURCATION DISEASE AND THE STAR (SUBINTIMAL TRACKING AND RE-ENTRY) TECHNIQUE FOR CTO PCI

W Widjanarko

**Background :** LM CAD is a severe condition due to high morbidity and mortality, especially case where there is distal or bifurcation stenosis in the LM involving the ostium of the LAD and/or the LCX. CTO is one of the anatomical factors which influence outcome. Antegrade strategy is the choice for CTO PCI.

**Case illustration :** 58-yo man with clinical presentation recent MI. CAG has shown type A LM Bifurcation. 70% stenosis at the distal LM, excentric and calcified lesion. 70% stenosis at the ostial LAD and CTO at the mid LAD after the branch of D1. 70% stenosis at the ostial LCX. PCI with LM-LAD as target lesions (provisional approach). Guide with 3,5/7Fr EBU catheter, 0,014” BMW GW crossed the ostial lesion and advanced to distal LCX. Conquest pro 12 GW could not pass the proximal cap, and then exchange with Gaia 3 wire could cross the lesion supported by finecross microcatheter by STAR technique, and then exchange to 0,014” runthrough hypercoat wire cross the current canal and advanced to distal LAD. Predilatation using 2,0mmx20mm River 2 balloon catheter at the site of the lesion, inflated up to 18 atm. 3,5mmx34mm DES Alex implanted at LM to proximal LAD, inflated at 14 atm. Post dilatation using ex-stent balloon inflated up to 16 atm. 3,0mmx18mm DES Alex implanted at mid overlapped with proximal stent, inflated up to 12 atm. Post dilatation using ex-stent balloon at overlapped segment of the stent. The last angiography was shown TIMI flow III and there was no complication.

**Discussion :** Based on low or intermediate SYNTAX score, the EXCEL randomized trial showed non-inferiority of PCI. The primary endpoint was achieved in 15,4% of PCI and 14,7% of CABG. The pre-specified secondary endpoint of the combined endpoint at 30 days was lower in the PCI group (4,9% for PCI vs. 7,9% for CABG). The 3-years combined endpoint including TVR again showed non-inferiority for PCI (23,1% for PCI vs. 19,1% for CABG). CTO lesion is challenge for interventionalist. The right choice of guide catheter, wire, and technique or strategy could lead to successful therapy. The antegrade approach is one of strategy for CTO PCI. Commonly encountered problems with the antegrade approach and potential solutions, such as wire cannot cross proximal cap and the potential solution is increased support guide catheter with pass micro catheter near proximal cap to increase wire force. Use of the subintimal space to recanalize the CTO with STAR technique, OTW balloon catheter stenting, and parallel wire technique

**Conclusion :** PCI is non-inferiority for the LM CAD, including LM bifurcation. STAR is chosen technique for this case.

**Keywords :** PCI, LM bifurcation, CTO, antegrade approach, STAR technique.





## **INFLATED BALLOON DISLODGEEMENT**

**Wenni Erwindia; Yudi Her Oktaviono**

### **ABSTRACT**

Percutaneous coronary intervention is an important modality in the treatment of coronary artery disease. Rare complication, including dislodgement of inflated ballon, dislodgement of stent, unexpanded stent, stent fracture, stent loss etc can occur during percutaneous coronary interventions (PCI) We present the case of an dislodgement of inflated ballon due to broken wire, which is an extremely rare complication and lead severe coronary ischemia.

## FEASIBILITY OF 6FR AD HOC TRANSRADIAL TWO-STENT STRATEGY ON LEFT MAIN BIFURCATION STENTING

Yusuf Galenta, Amir Aziz Alkatiri

### Clinical information :

A 47 years old male with a history of stable angina CCS 2 for 1 month and he had positive stress test. Risk factors include hypertension and ex smoker. Physical examination was remarkable. ECG has showed slight ST segment depression on V2-V4. He was sent to cathlab for coronary angiography.

### Coronary Angiography :

Angiography findings : LM: stenosis 50% at distal part, LAD: stenosis 50-70% at ostial to proximal part, LCx : ostial stenosis 90% , RCA was normal.

**Crucial Question :** Regarding the complexity of bifurcation lesions , should we convert to femoral access or 7Fr system?

### PCI:

A 6 Fr EBU 3.5 guide catheter was engaged the left coronary ostium. We plan for T-stenting and protrusion (TAP) technique for the bifurcation. A 0.014" wire was inserted to LAD and second 0.014" wire to LCx . Predilation with 2,5 x 20 mm balloon at LM to LCx proximal up to 10 atm. Using the same balloon 2,5 x 20 mm to predilate LM to LAD proximal up to 16 atm. LM-LAD stenting with DES 3.0 x 28 mm up to 14 atm. After rewiring LCx, opening stent strut with 1.5 x 15 mm balloon up to 18 atm, upsize with 2,5 x 20 mm balloon up to 14 atm. Stenting LCx with DES 2,75 x 15 mm with slight protrusion to the distal LM , inflated up to 14 atm. Final kissing balloon was performed with 3,0 x 28 mm balloon placed LM-LAD and then second balloon 2,5 x 20 mm placed to the LM-LCx. Proximal optimization technique (POT) on LM with NC balloon 3,5 x 12 mm up to 16 atm was commenced. Final result was acceptable.

### Conclusion

Dealing with left main bifurcation lesion is challenging and maybe tricky. We have shown feasibility of LM bifurcation stenting (two stent strategy) via trans radial 6Fr in ad-hoc setting.

## CULOTTE TECHNIQUE :

### AN UN-PLANNED TECHNIQUE IN LEFT MAIN BIFURCATION STENTING

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#### Introduction

Significant left main coronary artery disease (LMCAD) is found in 4 to 6 percent of all patients who undergo coronary arteriography. LMCAD is a challenging subset for percutaneous coronary intervention (PCI), especially in the disease involves the distal bifurcation. Despite the recent developments that have been made in the field of percutaneous left main (LM) intervention, the treatment of distal LM bifurcation remains challenging.

#### Aim

To present a culotte technique as one of choice technique in left main bifurcation stenting

#### Case Illustration

A 61 years old male with left main and 3 vessel disease, refused for CABG, present to catheterization laboratory for stage PCI after successfully PCI to RCA. Patient was planned for PCI to distal LCx and to LM bifurcation. PCI to distal LCx done successfully with satisfactory result. PCI to LM bifurcation planned with reverse-T technique and mini-crush technique as the second plan. The first stent to ostial LCx and the second stent to LM-LAD. Initially, stent was positioned to ostial LCx and balloon to LM-LAD. Stent in LCx was deployed first, but stent was slipped-back to LM during deployment. Reverse-T technique and mini-crush was no longer appropriate for this situation. Proximal optimization technique (POT) performed proximal to LM bifurcation. Then re-wired and ballooned through LAD to open stent-struts. Ivus measurement was performed to LAD. Due to anatomical reason and stent thrombosis issue, we decided to do culotte technique. Second stent deployed to LM-LAD. Next, Re-wiring to distal LCx passed stent-strut and dilated stent-strut with balloon. High-pressure dilatation was performed to both branch individually. Finally, kissing balloon inflation simultaneously to both branch. Final result was satisfactory.



## **Resume**

Distal LM bifurcation PCI remains challenging. Some strategy was developed correlated to vessel-anatomy and type of lesion. Culotte technique if one of choice technique in LM bifurcation PCI.

***Keywords : left main bifurcation, PCI, culotte technique***

## CTO PCI WITHOUT GUIDE ENGAGEMENT

Perhentian Aruslit Ginting

Muhammad Ali SK Abdul Kader

### Abstract

CTO PCI is a complex coronary intervention with high succes and low complication rate in the experienced hand and dedicated center. CTO PCI can improve quality of life, LV fuction and survival. J-CTO Score can predict the succes rate of procedure base on angiographic profile in the setting normal extracardiac artery for delivery and good guide catheter engagement. Here we present a PCI CTO in patient with tortous artery and with huge conical left main confer difficulty in guide engagement. PCI done eventually without guiding catheter engagement

A 75-years-old male, hypertension and dyslipidemia who complaining on and off chest pain on moderate exertion reffered from another hospital for coronary angiografi and PCI. The ECG showed normal sinus rythm, Echocardiography showed good LV fuction, chamber are normal, no RMWA and valves are normal. The MSCT showed coronarie occlusion of Proximal LAD with huge LMCA.

Trans-right radial coronary angiogram showed huge left main, 70 % long lesion at osteal LAD and become total chronic occlusion at proksimal LAD after giving first diagonal and septal branch. LCx, RI and RCA showed no significant lesion. Using dual pucture (trans right radial for guide catheter to left main and right femoral for guide catheter to RCA) we proceed PCI to CTO Proximal LAD. Despite unstable guide catheter engagement to RCA with intermitten disengagement and without engagement to left main, guided by retrograde flow from conus branch RCA we finnaly able to cross the lesion to distal LAD and delliver ballon then predilate lesion from proksimal LAD to osteal LAD. In order to make guidecatheter more stable for stent deployment we insert another guide wire to ramus intermedius. Finally we able to deploy the first DES to proximal LAD and another DES to osteal LAD (overlapping). The final shot showed good result, TIMI 3 flow with no dessection nor ferforation and the next day patient went home asyntomatic.



## **INTRACRANIAL BLEEDING AFTER SUCCESSFUL THROMBOLYTIC IN POSTEROLATERAL STEMI PATIENT: A DEAD CASE REPORT**

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### **Abstract**

A 57-year-old woman came to the hospital with chief complaint of chest pain since 7 hours before hospitalization, pain was severe, arising after activity, not losing with rest, spreading to the left shoulder and back. Her risk factor was hypertension and had breast cancer since 2013 without treatment and chemotherapy. History of T2DM, and stroke were denied by patient. Physical examination within normal limit. Electrocardiography showed ST elevation in postero lateral wall. We decided to do thrombolytic therapy first and the result was success. After successful thrombolytic, we wanted to do angiography, but unfortunately the patient went unconscious. CT was performed and found a large intracranial hemorrhage. Discussion with neurologist and neuro surgeon was done and conservative strategy was chosen. And 3 hours after ICH was diagnosed, the patient passed away.

## IN-STENT RESTENOSIS: DO NOT UNDERESTIMATE GLYCEMIC CONTROL AFTER PERCUTANEOUS CORONARY INTERVENTION

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**Background:** Restenosis after angioplasty and stent implantation has been historically considered the most significant problem in coronary interventional treatment<sup>1</sup>. Diabetes mellitus (DM) patients treated with balloon angioplasty or stenting have higher rates of restenosis than non diabetes<sup>2</sup>. Poor metabolic control expressed as elevated HbA1c, defined as either >7.0% at the time of a percutaneous coronary intervention (PCI), has also been related to restenosis in patients with diabetes<sup>3</sup>.

**Case Illustration:** A 62-year-old man who has undergone intermediate invasive strategy seven month ago because of unstable angina pectoris and uncontrolled diabetes. Coronary angiography revealed one vessel disease on left anterior descending (LAD). PCI was performed with two DES at mid-distal LAD and successfully restored coronary flow to TIMI flow III. Patient return to emergency department with typical chest pain five hours before admission. Electrocardiographic showed ischemic in anterior extensive lead. Laboratory findings showed cardiac enzyme was not elevated, from medical documents showed A1c not reaching target, uncontrolled fasting plasma glucose and post prandial blood sugar. Patient performed coronary angiography for the second time, revealed ISR 70 % at mid LAD and ISR 50% at distal LAD of the previously placed stent. PCI procedures was performed with 1 DES at mid LAD and continued with plain old ballon angioplasty (POBA) at distal LAD was successfully restored coronary flow to TIMI flow III.

**Discussion:** Findings in several studies suggest that diabetic patients are also at increased risk for restenosis after PCI. Restenosis is a complex biologic process, involving vessel recoil, vasospasm, thrombosis, and intimal smooth muscle cell hyperplasia<sup>4</sup>. The United Kingdom Prospective Diabetes Study (UKPDS) showed that intensive glyceimic control in patients with type II diabetes resulted in a significant improvement in microvascular events<sup>3</sup>. In diabetes patient, new generation DES are recommended over bare-metal stents (BMS)<sup>1</sup>. DES release antiproliferative drugs that reduce neointimal formation, thereby reducing in-stent restenosis rates to below 10%<sup>5</sup>.

**Summary:** Diabetes is a strong predictor of restenosis after coronary intervention. Significantly higher rate of restenosis in poorly controlled diabetic patients compared with well-controlled diabetic patients<sup>6</sup>.

**Keyword:** Diabetes mellitus, Percutaneous Coronary Intervention, In-stent restenosis.

## ACUTE LIMB ISCHEMIA IN OLD-AGE TUBERCULOSIS WITH HEPATIC TOXICITY POST TUBERCULOSIS DRUG TREATMENT, WHAT SHOULD WE DO?

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**Background** : Tuberculosis remains an infectious disease with a high prevalence worldwide. Inflammation participates in all stages of atherosclerosis, including PAD.

**Illustrated Case** : A 75-year-old man complained right foot pain 4 days before admission. It appeared blackish red and the tip of right toes turned black. Two weeks before admission patient was diagnosed with pulmonary tuberculosis new cases, receiving anti tuberculosis drug. No pathological history. Oxygen saturation of the right five toes are 0%. Pulseless in right dorsalis pedis, popliteal and femoral artery. Echocardiography showed mild aortic regurgitation. Duplex ultrasound showed thrombus in the right common femoral artery. MSCT Angiography peripheral lower extremity showed chronic total occlusion in artery iliaca externa dextra, collateral artery iliaca interna dextra to artery femoralis communis dextra. Gene Expert MTB was detected, increased liver enzymes, HIV negative, leukocytosis and elevated hsCRP. Diagnosed with stage IIB ALI right inferior extremity, stage 1 hypertension. Pulmonary TB treatment was stopped until the improvement of liver function and then replaced regiment therapy. Received heparin, atorvastatin, betablocker, ACE inhibitors, hepatoprotector, antibiotic. Amputation bellow right knee was performed after failed thrombectomy.

**Discussion** : The risk of PAD was 3.93 fold higher in the patients with TB than in the non-TB controls with cohort study. Side effects related to anti-TB drugs were reported by a higher proportion of elderly patients.

**Conclusion** : Reported 75 y.o man with stage IIB ALI hepatic toxicity post tuberculosis drug treatment, with risk factor hypertension underwent thrombectomy and amputation. Patients with TB had higher risk of developing PAD than the general population .

**Keywords:** Acute Limb Ischemia, Tuberculosis.



## PER CUTANEOUS CORONARY INTERVENTION OF THE CHRONIC TOTAL OCCLUSION OF THE LEFT MAIN WITHOUT VISIBLE STUMP

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### Abstract

Left main (LM) coronary disease is defined as greater than 50% lumen narrowing. Compared with medical therapy, coronary artery bypass graft (CABG) surgery has been reported to confer a survival benefit and is the gold standard therapy in patients with LM disease in guideline. However, with the development in stent design, improvement of operator's experience, and major advance of pharmacology such as dual antiplatelet regimes have led to LM stenting being considered to increasing acceptance of percutaneous coronary intervention (PCI) as an alternative to CABG for LM disease. Although stenting of the LM is a common practice nowadays, chronic total occlusion (CTO) of the LM especially when the stump is not visible is a great challenge. A 57-years-old gentleman was referred to our hospital because of the CTO LM and no visible stump. The length of the CTO was around 25 mm and distal part of LAD filled by collateral from the RCA.

For this un-visible ostial CTO LM, the antegrade approach was almost impossible to attempt. Therefore, retrograde approach was our main attempting. The retrograde approach from RCA was successfully performed by using 150 cm microcatheter Fine-cross® 1.8F (Terumo, Japan) and a Fielder XT-R® (Asahi, Japan) GW for surfing septal collateral. The wire finally passed the CTO lesion by intimal tracking technique and able to advance into contralateral guiding-catheter (GC) JL4 7F, but the microcatheter Finecross® cannot be crossed the lesion. The Fielder XT-R wire then was trapped by 2.5 balloon in the contralateral GC JL4 7F. The microcatheter Fine-cross® 1.8F was then easily advanced into contralateral GC JL4 7F. The GW Fielder XT-R® was replaced by 330 cm RG-3® (Asahi, Japan) wire and externalized from GC JL-4. The LM and proximal LAD was dilated by 2.5 mm balloon and 2 workhorse wires was successfully inserted into LAD and LCX by using double lumen microcatheter (Crusade®, Kaneka, Japan) respectively. One 2.5 mm in diameter of drug eluting stent (DES) was inserted into proximal LCX and short 3 mm balloon was inflated for proximal optimization technique (POT) at the very proximal LCX. Two long DES of 3.5 mm and 3 mm inn diameter was inserted into ostium LM to LAD using DK crushed. The LM was POT using 4.5 mm short NC balloon. The amount of contrast was 335 cc, the procedure time was 201 minutes, the flouro time was

69.1 minutes, the DAP was 313.377 mGy/cm<sup>2</sup>, and the airKerma was 6311.5 mGy. No complication was noted. The patient was discharged on the next morning. During follow-up of 1, 3 and 6 months, the patient was well, no symptoms and his treadmill test was significantly improved.

To the best of our knowledge, this is the first case of stenting of the ostial CTO LM which is stump un-visible. The stenting of un-visible ostial CTO LM is feasible, safe and effective as an alternative for CABG.

**Keywords :** Left Main, CTO, Retrograde approach

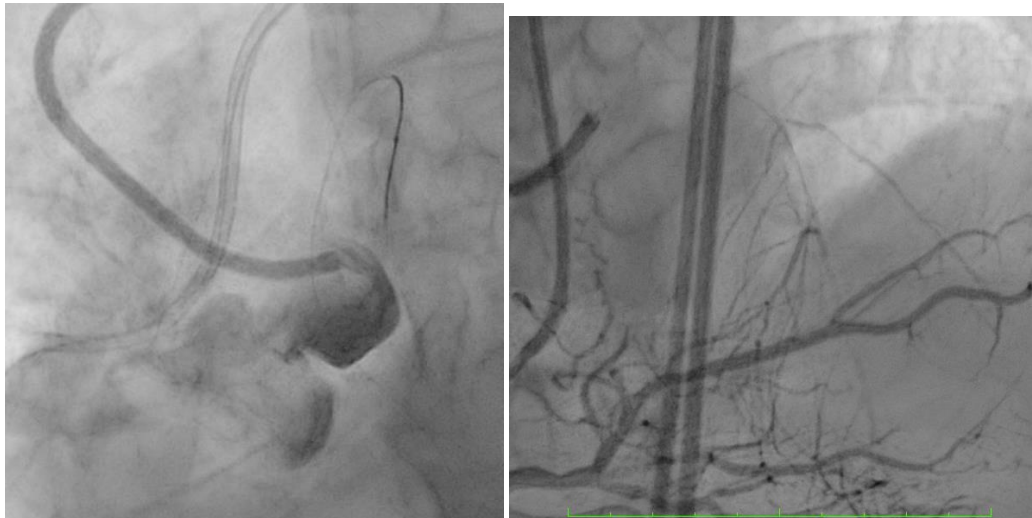


Pic. 1a . Total occlusion of the LM without visible stump

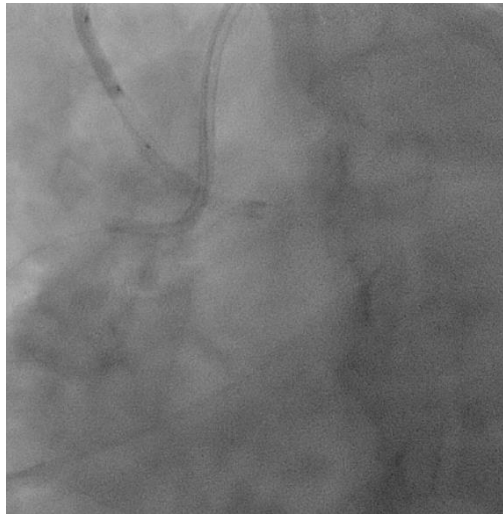
1b. distal LAD filled with collateral from RCA



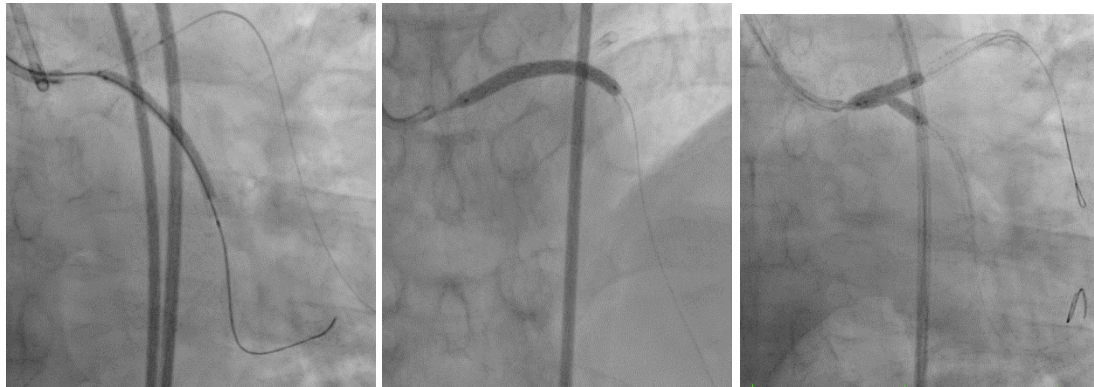
Pic 2a&b. Retrograde Approach. Fielder XT-R wire surfing through septal collateral



Pic 3. Fielder XT-R wire passed the CTO lesion by intimal tracking technique



Pic 4. Wire externalization using balloon trap.



Pic 5. DK crushed technique at LM



Pic 6. Final result

## SIMPLE TECHNIQUE IN DEALING WITH STUCK OF DEFLATED CORONARY STENT BALLOON: A CASE REPORT

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**Introduction:** A rare potentially catastrophic complication of PCI is device entrapment. We report a situation in which a coronary stent balloon in spite of full deflation getting impacted in a partially dilated stent at a tight area of calcified stenosis in left circumflex artery (LCx).

**Case Illustration:** A 56-year-old man with hypertension and dyslipidemia came to our hospital scheduled for elective PCI procedure. PCI was performed via the right femoral artery, LCA cannulation using guiding catheter CLS 3.5/6F showed moderate calcified and long stenosis 80-90% (diffuse disease) from proximal to distal of LCx. A guide wire RNS Hypercoat was introduced into the distal LCx with some difficulty. The 2.0-mm scoring balloon successfully crossed the lesion, and predilatation was accomplished. Double wiring with guide wire Asahi Sion Blue advanced to distal 2<sup>nd</sup> Obtuse Marginal branch (OM). The Drug eluting stent (DES) (2.5x38mm) successfully crossed mid segment and implanted from proximal LCx to ostial part of 3<sup>rd</sup> OM. The distal segment of DES couldn't perfectly expand because of moderate-severe calcification, although we inflated the balloon at 11 atm three times. We didn't dare to inflate more than 11 atm, for fear of rupturing the proximal part. After deflation, the stent balloon was stuck inside a stent. The initial short wiggle, push and rotatory movements to withdraw the balloon were all unsuccessful. We tried to re-inflate at 11 atm several times to optimize distal part of stent expansion, but the balloon still can't be pulled out of the stent. Patient experienced of chestpain, antianginal drugs was given. We tried to re-inflate at low pressure (4 atm) a few seconds, then the balloon was successfully pulled out of the stent. Stent boost method showed the distal part of implanted DES hasn't expanded perfectly. A postdilatation was performed with a 2.5x15mm NC balloon (16-18 atm). Strut dilatation at distal LCx with a 1.5x9mm compliance balloon (10-12 atm) was performed. The final angiogram showed an optimal outcome and the procedure was stop.



**Discussion:** This case highlights the success of a simple low pressure inflation technique as a rescue approach to retrieve the entrapped stent balloon at a tight area of calcified stenosis in left circumflex artery (LCx). This technique is thought based on observations, when re-wrapping balloons, low pressure inflation makes the shape of the deflated balloon become neater and smoother. This would be a quite rewarding experience at low resource settings to save the patient from catastrophic complications.

## DUCTAL STENT IMPLANTATION AS AN ADJUNCT THERAPY TO BALLOON PULMONARY VALVULOPLASTY IN CRITICAL PULMONARY STENOSIS : IS IT NECESSARY OR OPTIONAL ?

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### Abstract

### Introduction

Balloon pulmonary valvuloplasty (BPV) has been the standard management of critical pulmonary stenosis (CPS). Despite the success of BPV, the need to augment pulmonary blood flow still prevailing. This is a systematic review to evaluate the benefit of ductal stent (DS) as an adjunct therapy to BPV in CPS

### Method

Electronic search was carried out in PubMed and COCHRANE database to September 2018. The literature search followed the PRISMA guidelines. Individual study quality was assessed using Newcastle-Ottawa Scale. Primary outcomes observed were SaO<sub>2</sub>, reintervention, conversion to surgical shunt, RV to Aortic pressure gradient, and RV to PA pressure gradient.

### Result

Two studies were included with a total of 128 subjects with CPS underwent BPV. Overall, pre-procedural and post-procedural SaO<sub>2</sub>, RV to PA pressure gradient and RV systolic dysfunction were improved. Twenty two subjects required pulmonary blood flow augmentation after a successful BPV. Subjects with duct dependency persisted after a week's time were received DS. DS was performed in the same session in 16 subjects and in a subsequent session in six. Initial SaO<sub>2</sub> was significantly lower in subjects that subjected to DS (78.1±8.26; 72±10.1; p<0.028). The median TV and PV diameter and Z score were statistically low in patients requiring pulmonary blood flow augmentation with DS (p = 0.002 for the TV annulus; p= 0.011 for the TV Z score; p=





0.009 for the PV annulus;  $p = 0.004$  for the PV Z score). A TV and PV Z score less than  $-1.93$  SD and  $-1.69$  predicted the need for pulmonary blood flow augmentation with DS if ductal dependency persisted for a week's time following BPV.

### **Conclusion**

The need for pulmonary blood flow augmentation in post-BPV CPS is frequent. Adjunct therapy with DS is safe and advisable in selected cases where RV compliance status is compromised.

**Keywords :** *Critical Pulmonary Stenosis, Balloon Pulmonary Valvuloplasty, Ductal Stent*



## **ATHERECTOMY BURR ENTRAPMENT, WHAT CAN WE DO?**

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### **Introduction.**

Rotational atherectomy (RA) is one of modality for treating heavily calcified lesions. However, some complications may be encountered during RA procedure, including entrapment of burr. Entrapment of the burr within calcified lesion is an uncommon, but serious complication during rotational atherectomy and sometimes needs surgical retrieval.

### **Aim.**

To present a case of burr entrapment and share the available literature about management strategies for atherectomy burr entrapment

### **Case presentation.**

A 70 years old female with stable angina pectoris present to catheterization laboratory for elective coronary angiography and intervention. After angiography we found 90% stenosis at mid part with severely diffuse calcified disease and highly angulated vessel of the LAD. Attempt to perform IVUS first was failed as the IVUS catheter couldn't cross the lesion even after we performed predilatation with NC balloon. We decided to used rotational atherectomy using a 1.25 mm atherectomy Burr and platformed to 160,000 rotations per minute. The first run went well, but the second run, as we want to cross the tightest lesion, the burr was trapped. We did the potential techniques proposed to solve this complication percutaneously, including simple manual traction, advanced the burr into the distal lumen, and balloon dilation to release the trap but still couldn't



release the burr. Wedging the burr with a deeply intubated guiding and child catheter facilitate the burr retrieval in this case. No any perforation seen but the TIMI flow was II. The patient remained hemodynamically stable and we plan for CABG in prepared manner.

### **Resume.**

Burr entrapment is a rare but serious complication during RA. Percutaneous techniques such as simple manual traction, burr advancement to distal, passing another wire followed by balloon inflation, or deeply intubated guiding and child catheter can be tried to retrieve the stuck burr. Gentle pecking motion with shorter runs of ablation may prevent such complication.

*Keywords: PCI, calcified lesion, rotational atherectomy,*

## **EXTENSIVE ANTERIOR STEMI WITH HIPERGLIKEMIA WITH EFUSI PLEURA WITH CARIOGENIC SHOCK CONDITION – T-STENTING TECHNIQUE FOR TREATMENT OF TRUE BIFURCATION LESIONS : A CASE REPORT**

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**Background:** Percutaneous coronary intervention of complex true bifurcation lesions often fails to ensure continuous stent coverage and strut apposition in both the side branch and main vessel. Provisional T-stenting with stenting of the main vessel (MV) and optional side branch (SB) stenting in case of significant SB ostial occlusion is the strategy used nowadays by most interventionalists for treating bifurcation lesions.

**Case Description:** A 65-year old man came to the emergency department with > 12 hours typical chest pain, that appeared while sitting, with stabbing retrosternal chest pain radiating from back to left arm, duration more than 20 minutes, the complaint accompanied by nausea, vomiting, cold sweating, dyspnea, and palpitation. Medical history was hypertension, there's smoking history and no family history of cardiac disease and sudden death.

On physical examination, blood pressure 158/93 mmHg, heart rate 107 bpm, regular, respiration rate 22 bpm. There were rhonchi at the base of the right and left lung with wheezing. The electrocardiogram showed extensive anterior STEMI with increased of cardiac biomarkers and laboratory findings leukocytosis and hyperglukemia (uncontrolled blood glucose). Then the patient was treated with dual antiplatelet, nitroglycerin, heparin, statin, antibiotic ceftriaxone 2gr and ACE-I. Thorax showed aorta elongation and calcification, suspect pulmo edema with suspicious secondary infection

After about 3 days admission, coronary angiography showed 90% stenosis at distal LMS-LAD, 90% stenosis at ostial LCx, irregular at RCA LCx. One stent DES at distal LMS-LAD with 1 stent

DES at ostial LCx was inserted with final angiography showed TIMI 3 flow. The patient was transferred to the intensive care unit after PCI, he experienced a decrease in haemodynamic then fell on cardiogenic shock condition. He was treated with inotropic agents e.g norepinephrine. Intravenous heparin, nitroglycerin, oral isosorbide dinitrate and nitroglycerin being put off. And clopidogrel was replaced with ticagrelor.

Echocardiography result ejection fraction 43 %, decreased left ventricle systolic function, hypokinetic left ventricle except basal until mid anteroseptal, restrictive disorder diastolic dysfunction, sinistra pleura effusion. After which, the patient had profound recovery, and was discharged at day-7.

**Conclusion:** Patient with extensive anterior STEMI, complicated by cardiogenic shock, was salvaged angioplasty which done by T-stenting technique. When treating bifurcation lesions, we must pay attention to choosing the right guiding catheter size. Implantation of two stents as the initial approach is appropriate when both branches are significantly diseased (diameter stenosis 50%) and suitable for stenting. The T technique is less laborious than the crush technique. Unlike the V technique, it can be used for the coverage of lesions located proximal to the bifurcation.

**Keywords:** extensive anterior myocardial infarction, percutaneous coronary intervention, T-stenting technique, acute coronary syndrome, cardiogenic shock, bifurcations.

#### Reference

1. Iakovou I, Foin N, Andreou A, Viceconte N, Di Mario C. New strategies in the treatment of coronary bifurcations. *Herz* 2011; **36**: 198– 213.
2. Foin I, Alegria-Barrero E, Torii R, Chan PH, Viceconte N, Justin ED, Di Mario C. Crush, Culotte, T and Protrusion - Which 2-Stent Technique for Treatment of True Bifurcation Lesions. *Circulation* 2013; **77**: 73-80
3. Waksman R, Bonello L. The 5 Ts of Bifurcation Intervention: Type, Technique, Two Stents, T-Stenting, Trials. *JACC: Cardiovascular Interventions* 2008; 1: 366-368
4. Iakovou I, Ge L, Colombo A. Contemporary Stent Treatment of Coronary Bifurcations. *JACC: Cardiovascular Interventions* 2005; 46: 1446-145

## FEASIBILITY AND OUTCOME OF TRANSCATHETER PATENT DUCTUS ARTERIOSUS CLOSURE WITHOUT FLUOROSCOPY

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### Background

The conventional transcatheter closure of patent ductus arteriosus (PDA) under fluoroscopic guidance is an established method of treatment with no reported mortality and low morbidity. However, growing and developing tissues are more sensitive to the effects of radiation. Thus, there is an urgent need for alternative imaging methods to reduce risk of radiation. A fluoroscopy-free technique has been introduced but the evidence remains lacking. The aim of this paper is to review the available literature documenting the feasibility, safety and efficacy of transcatheter PDA closure without fluoroscopy.

### Method

Journal searching in PubMed, MEDLINE and COCHRANE databases from earliest available to 2018 was conducted. The results from 2 retrospective review comprising 306 patients were included in this review. Both review used transthoracic echocardiography as a major guidance for device selection and closure. The primary outcomes were the complete closure without significant residual shunt and aortic or pulmonary artery obstruction, and major procedure-related complications.

### Results

All of studies in this review showed a consistent result. The pooled successful rate (complete closure) were 99%. Two patients (0.6%) experienced acute occluder embolization. Transient mild to moderate thrombocytopenia was observed in 15 patients. However, no other major procedure-related complications were noted periprocedurally.

### Conclusion

Transcatheter PDA device closure under TTE guidance is technically feasible and relatively safe. However, accurate evaluation for the configuration of complex types of PDA is difficult due to limited imaging quality. Thus, patient selection is critical. Furthermore, a large multicenter study is needed to evaluate clinical safety and efficacy, in order to support this practice widely.

**Keywords:** *transcatheter closure, patent ductus arteriosus, without fluoroscopy*

## EYES ON THE LESIONS: IN-STENT RESTENOSIS AFTER PREVIOUS COMPLEX PCI

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### Background

Intravascular ultrasound (IVUS) is a valuable tool to see coronary arteries inside-out. IVUS cross-section view aid in lesion evaluation, stent sizing, and optimal stent placing confirmation. In bifurcation lesion, it is exceptionally useful to evaluate the lesion, stent and shifting plaque which can cause flow deterioration (snow-plow effect).

### Objective

To learn IVUS usefulness in determining etiology and management of in-stent restenosis (ISR)

### Case description

A 50 years old overweight, hypertensive and poorly controlled diabetic male with atypical chest pain. He had prior myocardial infarction in 2015 and was done primary PCI in RCA. Complete revascularization done in 2016 with PCI LM-LAD (cross-over technique). Less than 2 years, patient felt chest pain, angiography showed new lesion in ostial LCX, stent was placed with Culotte technique. One year later, another chest pain, angiography showed subtotal ISR LCX and 70% ISR LAD, significant stenosis ostial D1 and patent stent RCA. Lesion was prepped with balloon dilatation. IVUS showed ISR LAD minimum stent area (MSA) 4.1 mm<sup>2</sup> and ISR LCX MSA 4.2 mm<sup>2</sup>, both underexpansion. Drug-eluting stent was deployed in LAD and high-pressured post-stenting dilatation with non-compliance balloon was done. Bigger balloon was used to treat ISR in LCX. Kissing balloon dilatation was done at bifurcation. IVUS and angiography displayed shifting plaque to LAD which then dilated with high-pressured non-compliance balloon. Re-evaluation revealed the plaque shifted to LCX and were also dilated. IVUS showed LCX MSA 6.5 mm<sup>2</sup> and LAD MSA 8.1 mm<sup>2</sup>. Final result, no residual stenosis, TIMI 2 flow managed with intracoronary nitroglycerin 100 mcg, MBG 3.

### Conclusion

We have reported a case of in-stent restenosis due to underexpansion which proven by IVUS and managed by expanding with bigger balloon.

## RETROGRADE PCI ON RCA CTO: IVUS GUIDED REVERSE CART

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**Introduction:** Successful recanalization of coronary chronic total occlusion (CTO) may improve symptoms of angina or dyspnea, left ventricular (LV) function, tolerance for future acute coronary syndrome (ACS), and possibly long term survival. A retrograde approach generally is an alternative method, but may serve as initial approach when antegrade success rate predicted to be very low, and intervention collateral available. Intravascular ultrasound (IVUS) may provide useful information to improve the success rate of reverse controlled antegrade retrograde re-entry (CART).

**Objective:** To present a case of where IVUS provided pivotal information that result in successful reverse CART attempt.

**Case illustration:** A 59-year-old male present with history of acute myocardial infarction, was treated with primary percutaneous coronary intervention at left anterior descending artery (LAD) and found to have CTO at right coronary artery (RCA). We then planned an RCA CTO intervention a week later. Angiography revealed that the Japan CTO (J-CTO) score was 4. We choose primary retrograde approach via septal perforating branch. After successful retrograde collateral access, we try to connect the antegrade and retrograde wires with knuckle wire, kissing wire, and reverse-CART, but to no avail. We then performed IVUS at the CTO segment, from which we assess the calcific nature of the stump area, the huge subintimal space, and position of each guidewire. Armed with new information we then re-attempt reverse CART using larger balloon and at more distal position, and successfully maneuvered the retrograde wire across the lesion. We then continue with wire externalization, and finished with two overlapping stent deployed with the help of guidezilla. The final result was good.

**Resume:** In CTO with high J-CTO score and good intervention collateral, primary retrograde intervention maybe the preferred method. When numbers of methods failed to connect antegrade and retrograde wires, IVUS could give pivotal information that may improve our strategy and resulted in successful procedure. *Keywords: PCI, CTO, retrograde CTO, reverse CART, IVUS*