

## A case report: Extensive coronary artery dissection

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### ABSTRACT

Coronary artery dissections with or without rupture is a rare but well-recognized complication of coronary angiography with a high morbidity and mortality rate.

We present a rare case of extensive Right Coronary Artery (RCA) dissection that occurred during diagnostic coronary angiography. The vessel dissected during the first injection of contrast agent which was extended spirally from proximal to distal segment. Hopefully the dissection had stented successfully and the patient was discharged after 48 hour of intensive monitoring.

In conclusion coronary artery dissection represents a unique complication of percutaneous coronary intervention and to small extent diagnostic coronary angiography and, if untreated, can lead to serious sequelae including abrupt vessel closure, periprocedural myocardial infarction, closure of major side branches, vessel perforation, tamponade and death. In the present era, coronary stents successfully treat most dissections, so that the risk of sustained vessel closure or the need for emergency bypass surgery due to a dissection is very rare.

### الانسلاخ الشامل للشريان التاجي الايمن

ان انسلاخ الشريان التاجي القلبي مع او بدون تمزيقه هو حاله نادره لكنها معروفه كأحدى مضاعفات عمليات القسطرة التي تؤدي الى زياده نسبه الخطورة والوفاة.

هذه الحالة هي حاله نادره لانسلاخ الشريان التاجي القلبي الايمن الشامل حدثت اثناء عملية القسطرة التشخيصية وامتد الانسلاخ بشكل حلزوني من بداية الشريان الى نهايته. عولجت هذه الحالة بصوره ناجحة عن طريق زراعة شبكة الشرايين واخرج المريض بصحة جيدة خلال 48 ساعه.

ان انسلاخ الشريان التاجي يمثل احد اهم مضاعفات قسطره الشرايين التشخيصية او العلاجية وان تركه بدون علاج يؤدي الى مضاعفات خطيره تشمل انغلاق الشريان - احتشاء عضلة القلب - انسداد الشريان الفرعية - تمزيق الشريان او الوفاة.

ان اغلب حالات انسلاخ الشريان التاجي تتعالج الان بواسطه زراعته شبكة الشرايين لذلك انسداد الشريان التام او الحاجة الى عمليات القلب المفتوح الطارئة اصبحت الان نادره جدا.

### INTRODUCTION

Coronary artery dissections may occur during diagnostic coronary angiography but most often during therapeutic coronary interventions. Dissection may be extensive and may lead to vessel closure or perforation. The causes of dissection include guiding catheter, guide-wire, over-inflation of balloon and stent,<sup>[1,2]</sup> The dissection occur more often in the RCA than in the Left Coronary Artery (LCA) this may be related to deep engagement of catheter due to histological differences in the proximal vessel.<sup>[3]</sup> We present a case of iatrogenic acute coronary dissection during a diagnostic coronary angiography (CA).

### Case report:

A 47-year-old active man with a history of longstanding hypertension, dyslipidaemia and remote tobacco abuse. He complained of exertional chest pain and dyspnea, there was no orthopnea or paroxysmal nocturnal dyspnea. His medications included an angiotensin-receptor blocker (Valsartan), a diuretic (hydrochlorothiazide), an atorvastatin and aspirin. The physical examination was notable for an overweight and the blood pressure was 150/90 mmHg. Routine laboratory studies revealed an elevated serum level of cholesterol and triglyceride with normal blood sugar and renal function test. A 12-leads

electrocardiogram (ECG) showed no significant findings, whereas the echocardiography revealed Left Ventricular Hypertrophy (LVH) and diastolic dysfunction. Because of his exertional chest pain and dyspnea and atherosclerotic risk factors, the patient was referred for diagnostic cardiac catheterization.

### **Cardiac Catheterization**

Coronary angiography of LCA done under local anaesthesia and through right femoral approach revealed entirely large vessels diameter (ectatic vessels) including Left Main Stem (LMS) artery, Left Anterior Descending (LAD) artery and left Circumflex (LCx) artery with intermediate lesion of middle LAD segment (Figure -1).



**Fig 1. The Coronary Angiography of LCA revealed diffusely ectatic vessel with intermediate lesion of mid LAD segment (arrow).**

However on first injection of RCA, there was extensive dissection of also abnormally large RCA diameter (entirely ectatic), the dissection

extending from proximal segment downward in a spiral way involving middle to distal segment of RCA (Figure -2).



**Fig 2. The Extensive Spiral Dissection of RCA is shown on this left anterior oblique (45) projection (arrow).**

At that point patient was remained asymptomatic without chest pain and intra-arterial blood pressure monitoring revealed no significant change whereas the blood flow throughout the RCA diminished to TIMI (Thrombolysis In Myocardial Infarction) flow 1 and there was significant ST-segment depression in the inferior leads of ECG monitoring.

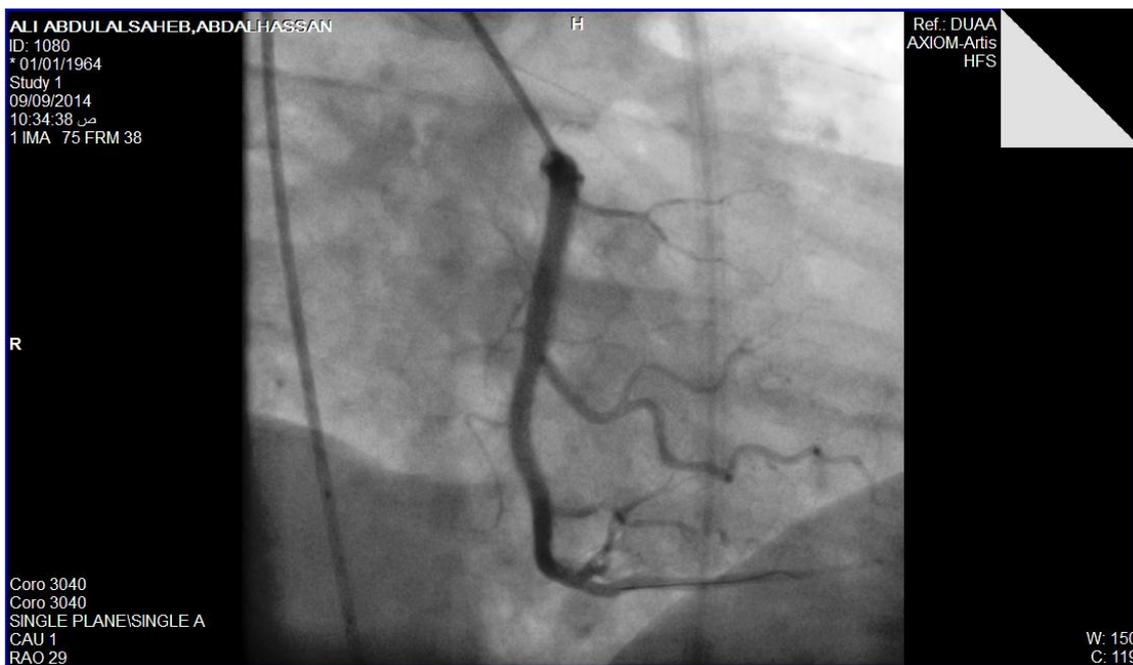
Immediate measures were taken to save patients life by stenting the dissection, patient given bolus doses of unfractionated heparin and GP 11 b 111 a inhibitor (abxici-mab) and the operator engaged a 6 French right Judkins 4.0 guide catheter in the RCA and floppy-tipped guide wire successfully pass on a second attempt through true lumen to the distal RCA (Figure-3).



**Fig 3. Insertion of floppy-tip guidewire into true lumen of distal segment of RCA (arrow).**

Stenting began from distal segment beyond the distal end of the dissection to prevent its progression with Drug Eluting Stent (Xience Prime) 4 x 23 mm was deployed at 12 bar, similar size and type of second stent placed proximal to and overlapped with distal one and was deployed at 14 bar, a third stent also typed Xience Prime and sized 4 x 23 mm were inflated at 16 bar through the proximal end of second stent. The last stent (fourth one) was

resolute 4 x 18 mm length covered the proximal end of the dissection and overlapped with the third stent which was deployed at 16 bar, and overlap inflated at 18 bar. Throughout the procedure patient was remained free of chest pain and haemodynamically stable, at the end of procedure the ST- segment changes disappeared from the ECG monitoring and the blood flow returned to TIMI 3 flow through the RCA (Figure-4).



**Fig 4. Achievement of TIMI 3 flow of RCA in right anterior oblique view after successful coronary stenting**

At this time patient transferred from the cardiac catheterization laboratory to the cardiac ward were given a loading dose of 300 mg clopidogrel and maintained on abxici-mab infusion for 12 hour. The patient was discharged the second day post procedure in stable cardiac condition and returned for follow up within two weeks feeling well without angina .

## DISCUSSION

Well known to an experienced interventional cardiologist, this case exemplifies the fact that a case cannot be declared easy until it is successfully completed even a case of a diagnostic CA. Coronary dissection represents a unique complication of percutaneous coronary intervention and to small extent diagnostic CA and, if untreated, can lead to serious sequelae including abrupt vessel closure, periprocedural myocardial infarction, closure of major side branches, vessel perforation, tamponade and death.<sup>[4,5]</sup> Arterial injury and dissection can be induced by any component of the procedure, including insertion of catheter (whether diagnostic or guiding catheter), guide wire (used

to direct balloon and stent catheter), balloon, stent (oversizing of balloon and stent or application of high pressure), and the use of atherectomy device. Catheter related dissection are often related to the use of large bore (i.e. 8 French) or aggressive catheter (such as an Amplatz curve) in order to get engagement, deep engagement of catheter especially when the catheter is not coaxial to the vessel, and when the vessel is abnormal as in aneurysmal or ectatic dilatation as what was happened in this case. In the present era, coronary stents successfully treat most dissections, so that the risk of sustained vessel closure or the need for emergency bypass surgery due to a dissection is very rare. Currently most emergency bypass operations occur when a dissection in a major artery cannot be controlled by percutaneous means. Unfortunately, emergency bypass surgery in the setting of failed percutaneous coronary intervention is associated with a high rate of in hospital death, myocardial infarction and stroke. Thus in the event of a large, untreatable dissection, the risk - benefit ratio of surgery must be carefully weighed against the

risk of leaving the artery closed and treating the resulting infarction medically.<sup>[6]</sup> Focal dissections respond well to stenting. It is important to identify the extent of the dissection and to cover both ends of the dissection with a stent. In this case the dissection affected nearly the entire artery and the decision to salvage the artery with emergency coronary intervention and stenting was successful and was avoid the risk of the emergency bypass coronary surgery which is not available in our cardiac centre at that time. However the lesson from this case is that the complication associated with cardiac catheterization could happened even with a simple diagnostic coronary angiography and all measure should be available to deal with any complication could be happen especially therapeutic coronary intervention and cardiac surgery.

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