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Case Report

Intra-Stent Thrombosis Secondary to the Allergic Reaction by Contrast in Elective Percutaneous Coronary Intervention, a Rare example of Kounis Syndrome, a Case Report

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Abstract

Background:

Kounis syndrome is the development of ACS secondary to allergic reaction. We are presenting case report of KS that developed due to allergic reaction in patient undergoing elective angiography and resulted in STEMI.

Case Presentation

64year old female underwent elective PCI for angina refractory to anti-anginal therapy. CTCA demonstrated severe Diagonal 2 Coronary artery disease. Due to on-going angina she was listed for coronary angiogram +/- PCI. Iodixanol was used as contrast medium.This revealed severe disease in the D2. Initially drug coated balloon to D2 used. But DCB of D2 causes dissection. We decided to deploy 2.25x24mmDES overlapping with 2.5x14mmDES. Final results were satisfactory. In recovery urticarial rash noticed on her back. IV Hydrocortisone 100mg and IV Chlorphenamine 10mg was administered. Shortly after, she developed chest pain with ST elevation in lead 1 and aVL. She was immediately taken for PCI. Iohexol contrast was administered to the patient. There was acute stent thrombosis, which when re wired allowed flow to be restored and ECG changes to resolve. Patient developed severe hypotension. A widespread urticarial rash noted over the body with peri-orbital and facial swelling. Patient stabilised with iv adrenaline infusion and transferred to CCU. She was started on oral prednisolone. Patient developed pain in right Iliac fossae after removal of the femoral line next day. She developed abdominal distension and severe hypotension. Her CT AP showed large retroperitoneal hematoma with extravasation from external iliac artery. Via interventional radiology lower dose of Iohexol was used and a stent was inserted in EIA. Patient was moved to ICU. She was discharged home 4 days later with dual antiplatelet for 1 year followed by lifelong Aspirin.

Discussion: This case was diagnosed with KS by Iodixanol as the source of anaphylaxis. There is need to treat KS as separate entity in ACS guidelines.

Keywords: stemi; coronary angiogram; kounis syndrome; complications of pci; anaphylaxis ; case report

Abbreviations:

KS: Kounis Syndrome

PCI; Percutaneous intervention.

GORD: Gastro-oesophageal reflux disease

CTCA: CT Coronary Angiogram

ECG: Electrocardiogram

RCA: Right Coronary artery.

OM: Obtuse Marginal

LAD: left anterior descending.

ISMN: Isosorbide mono nitrate.

CAD: Coronary artery disease

NC Balloon: Non-compliant balloon

IV: Intra Venous

DES: Drug-eluting stent

OCT: Optical Coherence topography.

US: Ultrasound

ITU: Intensive care unit

D2: Diagonal 2 Coronary artery

STEMI: ST Elevation Myocardial Infarction

EIA: External Iliac artery

Introduction:

Kounis syndrome is the development of acute coronary syndrome secondary to allergic reaction. It was first reported by Nicholas Kounis in1991. Allergic reaction leads to mast cell degranulation and release of inflammatory mediators as well as platelet activation. It most commonly happens in patient with coronary artery disease but can also occur in normal coronary arteries due to vasospasm. It is divided in to further subtypes. The diagnosis of KS is based on clinical manifestations. KS is not rare problem in fact very underdiagnosed condition. New triggers for KS are continuously being reported. We are presenting case report of Kounis syndrome that developed due to allergic reaction in patient undergoing elective angiography and resulted in STEMI.

Case report:

Patient Presentation: A 64-year-old female underwent elective percutaneous intervention (PCI) for angina refractory to anti anginal therapy. Past medical history included dyslipidaemia, fibromyalgia, Gastro-oesophageal reflux disease (GORD), anxiety and depressive disorder. ECGs were normal. Echocardiogram showed preserved biventricular function with no valve disease. CT coronary angiography (CTCA) showed a dominant right coronary artery (RCA) with mild plaque disease. The proximal, mid, and distal Left anterior descending (LAD) artery had mild disease with severe stenosis at the origin of second diagonal. There was no disease in circumflex and OM. The patient medication included Omeprazole 20mg, Bisoprolol 5mg, Citalopram 20mg, Calcium carbonate with Vitamin D3, Nicorandil 10mg BD and Rosuvastatin as well. The patient was unable to tolerate ISMN, but her symptoms improved with Amlodipine. On review in clinic, she mentioned on-going chest tightness; she was started on Ranolazine as an alternative antianginal therapy with Amlodipine. It was not tolerated due to excessive tiredness with a background of fibromyalgia. After discussion with the patient and her family, it was decided to proceed with a coronary angiogram with the view to intervene on one of the diagonals. She had been allergic to penicillin since childhood, but she couldn't recall the specifics of the reaction.

Initial Work up: The patient underwent invasive coronary angiography via right radial approach using 5F JR4 catheter and VL 3.0 guide catheter. Anti platelet therapy prior to the procedure involved maintenance dose aspirin 75mg at the time of being seen in clinic along with 600mg Clopidogrel loading on the morning of the procedure. Iodixanol was used as contrast medium. This revealed an unobstructed right coronary artery system with severe disease in the ostia of the small 1st diagonal and the large 2nd diagonal (Figure 1, Video 1). Initial Balloon dilation required a 2.5x15mm NC followed by a 2.5x20mm Drug coated Balloon (Paclitaxel). Repeat angiography at this point showed vessel dissection and ST elevation in leads I and AvL. The patient was asymptomatic. We therefore decided to deploy a 2.25x24mm Biomatrix drug eluting stent (DES) overlapping with 2.5x14mm DES. Proximal 2/3rd of DES was dilated with 2.5mm NC balloon to 12 atmospheres. Final angiographic results were very satisfactory (Figure2, Video 2). While being moved to the recovery area, it was noticed that the patient had an urticarial rash on her back. It was assumed as a mild allergic reaction to contrast medium. Intravenous (IV) Hydrocortisone 100mg and IV Chlorphenamine 10mg was administered with plan to give oral Prednisolone and Chlorphenamine for next 3 days. Within 30 mins, patient developed retrosternal chest pain with ST elevation in lead 1 and aVL. She was immediately taken for invasive coronary angiography as per ESC guidelines1.

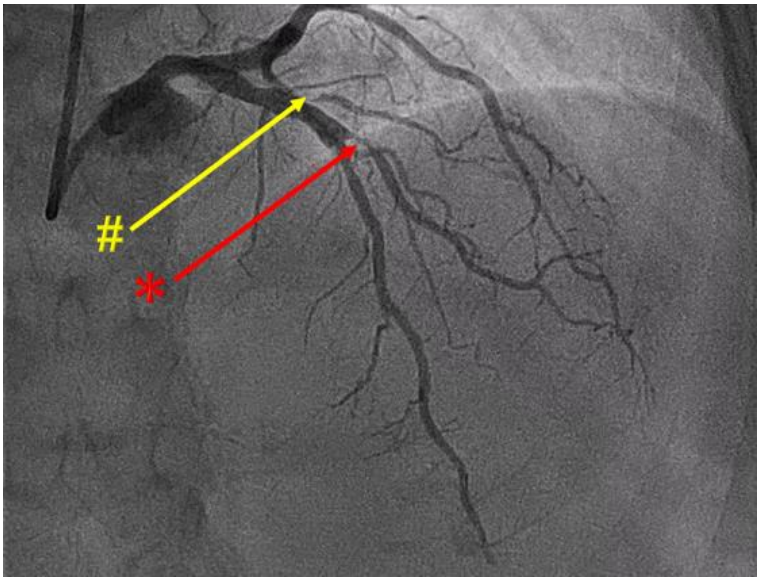

Figure 1: Initial angiogram showed good size second diagonal with severe ostio-proximal disease (*). The first diagonal was relatively small with severe ostial disease (#).

Video 1.mp4

Video 1: Initial angiogram in cranial view showing mild mid LAD disease. The first diagonal was relatively small size with severe ostial disease. The second diagonal is large with severe ostio-proximal disease.

Figure 2: Final angiographic result after stenting of the second diagonal branch showing widely patent , well expanded stent covering the ostium and proximal segment of D2 with TIMI 3 flow.

Video 2.mp4

Video 2: The final angiogram after stenting and optimization of D2 stent.

Diagnosis: A right femoral artery approach was used under ultrasound (US) guidance with a 6F JR4 catheter with a 3.0VL guide. Iohexol contrast was administered to the patient because she had not previously displayed any adverse effects. There was acute stent thrombosis (Video 3, Figure 3) which when re wired allowed flow to be restored and ECG changes to resolve. Optical coherence tomography (OCT) (Figure 4, Video 4) was performed to LAD due to appearances of plaque shift. There was no evidence of plaque rupture or thrombus. Aspiration catheterization into the diagonal artery did not remove any thrombus burden. Further improvement was seen with Eptifibatide and balloon dilation with a 2.5x1.5mm NC balloon. At this point, the patient had developed severe hypotension with a systolic blood pressure of 50 mmHg, and it was not responsive to phenylephrine. It was also noted that the patient has developed a widespread urticarial rash over the body with peri-orbital and facial swelling. These features suggested Anaphylaxis induced cardiac ischemia. She was given adrenaline (500 mcg) intramuscularly as per adult life support (ALS) guidelines. She already had intravenous hydrocortisone and chlorphenamine an hour before. The ITU team were called and a central venous line was inserted in right femoral vein with US guidance, and an IV infusion of adrenaline was started. There was TIMI3 flow in LAD and D2 and the procedure was halted as BP had responded well to therapy. She was gradually weaned off IV adrenaline over the next 3 hours. The facial oedema improved, but there was widespread urticarial rash on body. Serial serum mast cell tryptase levels were sent at the time of event, 4 and 24 hours later. The levels came back 14.4, 17.8, 4ng/L, respectively (NV <15ng/L). The femoral artery access site was closed with an angioseal in the lab. She was monitored in the coronary care unit for close observation and monitoring.

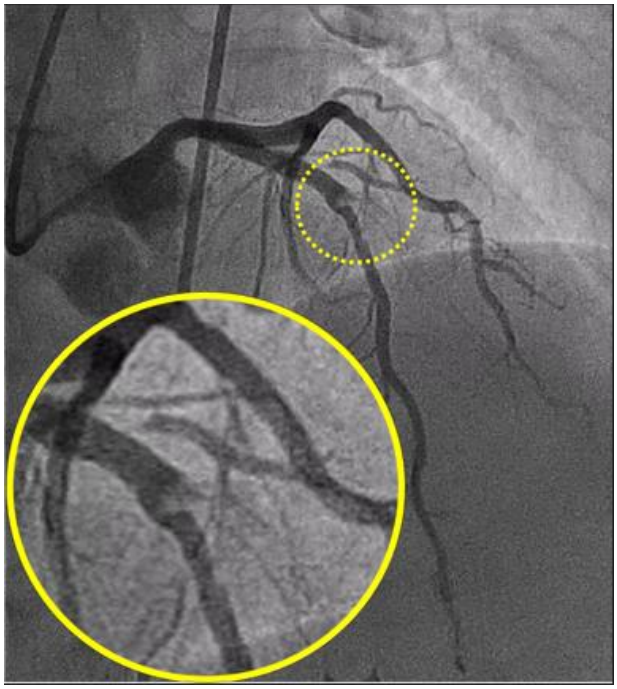

Figure 3: Coronary angiogram acute in-stent-thrombosis in the second diagonal stent with hazy appearance in LAD suggestive of extension of the thrombus to LAD.

Video 3.MP4

Video 3: The coronary angiogram showed acute in-stent-thrombosis in D2 stent with TIMI 0 flow.

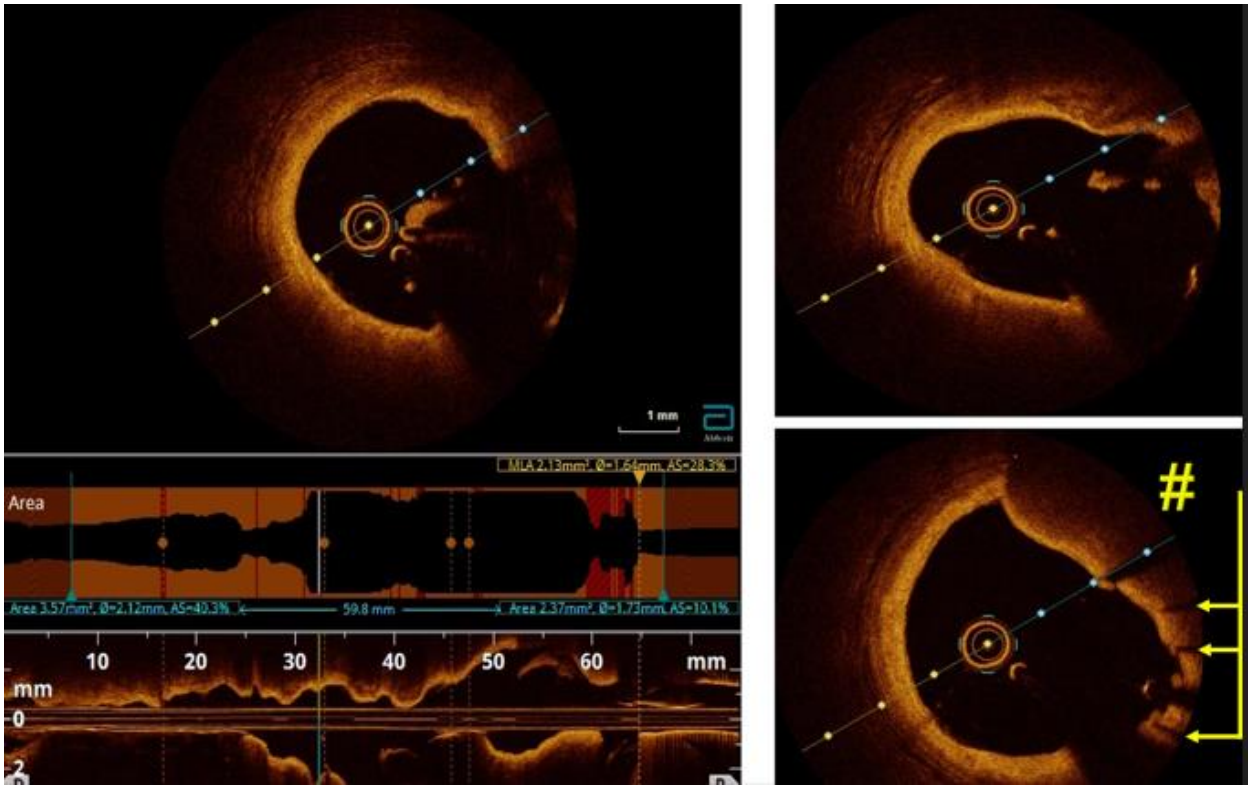

Figure 4: OCT of LAD showing intact LAD intima with no evidence of dissection. The D2 ostium was completely covered with stent struts (#).

Complications/ Follow-up: On next day (26 hours after procedure), upon mobilisation the patient developed pain in right Iliac fossae after removal of the femoral venous line. She developed severe hypotension with BP of 50mmHg systolic. She was treated with IV metaraminol and IV fluids. Her Bedside ECHO showed good systolic function and no evidence of pericardial effusion. She was tender in RIF with abdominal distension. Major Haemorrhage protocol was activated for suspected retroperitoneal haemorrhage. She was resuscitated with blood products as per hospital guidelines. Extra Platelets were requested due to recent Epitfibatide infusion. She had urgent CT Abdomen and pelvis with Intensive care support which showed large retroperitoneal haematoma with extravasation from external iliac artery (EIA). Via interventional radiology a lower dose of Iohexol was used and a stent was inserted in EIA using retrograde central femoral artery access. The procedure was uncomplicated, and patient was moved to intensive care unit (ICU). She was discharged to home 4 days later with dual antiplatelet (Aspirin and Prasugrel) for 1 year followed by lifelong Aspirin. She was well in clinic when seen 4 weeks later and had no residual effects of her admission.

Conclusion/ Discussion:

In this case, patient had no previous allergy to contrast medium. She underwent a trouble-free CT cardiac angiography with Iohexol contrast prior to admission. She received iodixanol for her first PCI. She had not previously received it. Iodixanol is iso-osmolar (290mOsm/kg H2O) to plasma due to addition of electrolytes compared to Iohexol (884mOsm/kg H2O)3. They both are non-ionic3. Both contrast mediums are considered safe compared to older contrast medium. Iodixanol is shown to have slightly higher incidence of delayed adverse reaction compared to other agents4. She was given Iohexol in second PCI and IR procedure and did not show any further evidence of anaphylaxis.

Kounis syndrome (KS) is rare but very actual possibility. KS is described as a temporary or permanent ischemia of cardiovascular system caused by an allergic or hypersensitivity insult5. The pathophysiology of KS is not completely understood, it is attributed to inflammatory cytokines especially histamine and inappropriate activation of platelets secondary to mast cell deregulation5. A metanalysis of 175 KS cases showed 74.3% were male, it can present at any age and most common medical histories were allergies, hypertension, hyperlipidaemia, diabetes and smoking6. There are no documented cases of KS in literature caused by contrast. KS has three known variants. This case was diagnosed with type III KS with Iodixanol as the source of anaphylaxis. There is need to treat KS as separate entity in ACS guidelines. The conventional management of ACS might not necessarily apply to all KS patients due to different pathophysiology6. Contrast induced allergies also pose a difficult challenge in patients who require PCI. Use of Gadolinium (Gd) might be an alternatives option, but more research and resources are needed.

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