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Case Report

Saline OCT in High Risk Patient with ACS

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Abstract

Coronary Angiography (CAG) is the most common modality for the assessment of coronary stenosis and intraprocedural guidance of Percutaneous Transluminal Coronary (PTCA). However, CAG has some limitations. It mainly shows luminal dimensions. CAG is limited in characterization of tissue or plaque morphology (except for calcium, coarse ulcerations, or large dissections) and assessing characteristics associated with suboptimal stent deployment. Optical Coherence Tomography (OCT) is an intravascular imaging technique that uses near-infrared light to image the coronary arteries. It provides detailed images of superficial coronary plaque components and divides into 3 types: Fibrous, Fibro-calcific and Lipid Rich. In ACS, OCT can detect plaque rupture, erosion and intracoronary thrombus. Despite the various benefits of OCT, as iodine based contrast is used there is a risk of Contrast-Induced Nephropathy (CIN). The other agents used are Dextran and Saline. We present a case of Acute MI with CKD under OCT guidance using Heparanised saline as a flushing media. This is the first case in Uttarakhand region of North India using heparanised saline in OCT.

Keywords: Optical coherence tomography; Frequency domain OCT; Contrast induced nephropathy; Myocardial infarction; Acute coronary syndrome

Introduction

Coronary revascularisation using imaging guidance is becoming the standard of care. Intravascular OCT uses near infrared light to obtain intravascular images. It also tells about nature of plaque like fibrous or calcific. In ACS it tells about plaque rupture, thrombus. It has a definite edge over CAG regarding stent apposition. Standard OCT employs iodinated contrast dye for flushing the blood which might lead to Contrast induced nephropathy in high risk patients specially with pre-existing reduced renal function, age >75 years, heart failure, diabetes mellitus and female gender. In such high risk cases there is a need to find a contrast-saving alternative. Low-molecular-weight dextran is one of the alternative that have been explored for coronary FD-OCT. Various Studies showed the image quality showed no significant difference when low-molecular-weight dextran is compared with iodine-based contrast media for coronary OCT image acquisition. However, dextran has been found to be associated with nephrotoxicity and anaphylactoid reactions. Heparinised saline is a safe, cheap contrast saving alternative to prevent Contrast Induced Nephropathy (CIN). There is no difference in image quality in comparison to iodinated contrast.

Case Presentation

A 48 year old male a known case of Diabetes Mellitus, CKD presented with complaints of chest pain of 3 hour duration. At presentation, he was hemodynamicaly stable. His ECG revealed IWMI. Coronary angiography revealed single vessel disease, mid RCA 90% thrombus containing lesion (Figure 1). In view of CKD OCT run using saline as a flushing media done preprocedure.OCT revealed red rhombus at lesion site (Figure 2) with minimal luminal diameter 1.62 mm and distal luminal diameter of 3.44 mm. Stenting to RCA done using 3 mm × 32 mm, DES (Figure 3) followed by post dilation using 3.5 mm × 12 mm balloon with good TIMI III flow. Post procedure OCT revealed good stent apposition (Figure 4). There was no adverse effect during and after Saline OCT.

Discussion

Optical Coherence Tomography (OCT) is a novel (for cardiology) intravascular imaging modality that using near-infrared light to create images. The high resolution of OCT identifies characteristics

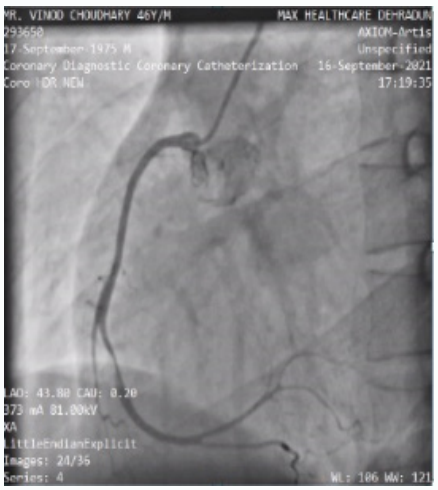

Figure 1: Coronary angiography med RCA 95% lession.

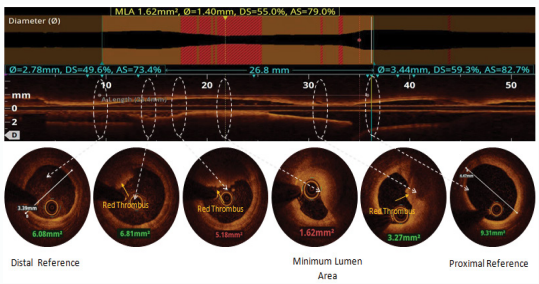

Figure 2: Pre pci Optical coherence tomography showing red thrombus.

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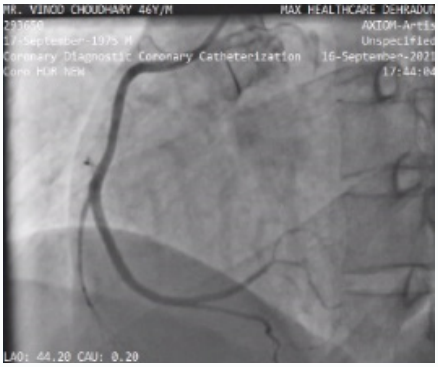

Figure 3: Coronary angiography post stenting.

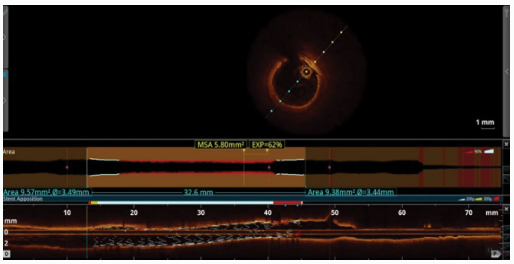

Figure 4: Post PLI Optical coherence tomography run showing well opposed stent.

of plaque that predispose to rupture, including the thin fibrous caps, large lipid cores, and accumulation of macrophages. OCT can provide critical information to guide coronary interventions, in addition to characterizing atherosclerotic plaques. Standard OCT employs iodinated contrast dye for flushing the blood which might lead to Contrast induced nephropathy in high risk patients specially with pre-existing reduced renal function, age >75 years, heart failure, diabetes mellitus and female gender. In such high risk cases there is a need to find a contrast-saving alternative. Low-molecular-weight dextran is one of the viable alternatives to iodine based contrast for coronary FD-OCT. But Dextran has been associated with nephrotoxicity and anaphylatic reaction .Heparanised saline is another cheap and safe alternative in high risk patients. Before OCT run with saline intracoronary nitroglycerine should be given to avoid saline induced coronary spasm and as saline has low viscosity there might be more blood artefacts which can be reduced with either increase rate or duration of flush. Although there might be transient electrocardiographic changes after flushing with saline, there is a rare chance of significant cardiac arrhythmias. A recent case series by Nalin k Mahesh published in Indian Heart journal also reported no haemodynamic or electrocardiographic changes or any other complications with heparinized normal saline The use of Saline OCT in large type III LAD should be avoided as there might be reflux of blood from septals or diagonals [1-6].

Our case illustrates use of Saline as a flushing media in OCT in ACS patient without any adverse effect.

Conclusion

Saline OCT is an excellent tool for imaging during ACS in patients with high risk of Contrast induced nephropathy. It is not associated with any significant adverse effect and image quality is also not compromised visa vis iodinated contrast.

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