Journal of Cardiovascular Disease Research
ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 09, 2024

Contrast Induced Pancreatitis following Coronary Intervention : Case series

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Abstract

There are numerous known risks associated with coronary artery angiography. Acute pancreatitis is a seldom reported side effect that can have fatal consequences. Here is the case series of 3 patients who experienced acute pancreatitis shortly after coronary artery intervention .Two processes are implicated in the development of acute pancreatitis during coronary artery angiography: toxicity from contrast agents and cholesterol emboli.

Introduction

Coronary artery disease continues to be the top cause of mortality for both men and women. The treatment of acute coronary syndromes includes both percutaneous coronary procedures (PCI) and angiography [1]. There are specific dangers associated with coronary angiography, such as anaphylactic and allergic reactions, problems with vascular access, stroke, and kidney damage from contrast-induced harm. It is well known that radiographic contrast agents can result in acute

renal damage. However contrast induced pancreatitis following coronary intervention is seldom reported[2-6]. We report a series of 3 cases who developed acute pancreatitis following coronary intervention. There is little knowledge about the pathophysiology of pancreatitis brought on by coronary intervention. In the proper clinical context, Coronary intervention-induced pancreatitis should be taken into consideration despite its exceptional rarity. The mechanisms postulated include toxicity from contrast agents and cholesterol emboli.

Case series

Case 1

A 65-year-old man with diabetes and hypertension showed signs of non-ST raised acute coronary syndrome. He came to see us a week after receiving medical care somewhere else. His left ventricular ejection fraction was 35%, having hypokinesis of the anterior wall. His coronary artery scan revealed a 95% lesion in the LAD. His pre-op investigation revealed normal amylase and lipase values with normal liver and kidney function test. Following a discussion of all available options, an angioplasty using a implanting a drug-eluting stent in the severely damaged LAD lesion. Dye used for the procedure was 90ml of Iohexol injection (350mg/1ml) After 48 hours, he was discharged with the same creatinine level of 1.3 mg/dL.

Three days later, he returned to the casualty, presenting with a history of acute nausea and epigastric discomfort.. He had a blood pressure of 100/70 mm Hg, a 120/min heart rate. Haemoglobin was 10.2 g/dl, SGOT was 30 U/L, SGPT was 132 U/L, Troponin, CPK, platelet counts,serum creatinine,serum urea and blood sugar levels were all normal. Repeated serum amylase level was 1023 U/L on the first day and increased to 1500 U/L on the next day. On the

first day, his serum lipase was more than 3000 units/L and stayed elevated within this range, throughout the course of several days. This suggested that acute pancreatitis, with associated renal and haemodynamic problems, could be the main issue. symptoms as the pancreatitis' secondary cause. His pancreatic was not well visible on his abdominal USG, and a CT scan revealed fatty liver, medical renal illness, and peri-pancreatic fat stranding with no gallstones and only moderate ascites and features suggestive of acute pancreatitis. His complement and procalcitonin levels were normal, excluding sepsis. There was no other identified cause of pancreatitis. With routine hydration care, inotopic support, and supportive care, the patient recovered and discharged after ten days.

Case 2

A 69-year-old woman was brought to the hospital for an coronary angiography for unstable angina since transthoracic cardiac echocardiography revealed septal hypokinesis with ejection fraction of 35%. There were no recent reports of abdominal injuries or pain. There was no history of childhood or recurrent pancreatitis in the family. Her prop investigations were normal. Triple Vessel coronary disease was discovered during the coronary artery angiography, necessitating Coronary Artery Bypass Grafting. The dye used for procedure was only 20 ml of Iohexol injection (350mg/1ml) .

She developed severe abdominal pain around the umbilicus when Abdominal ultrasound performed immediately showed no significant abnormality. She was managed conservatively for pain abdomen . Serum amylase level was 900 U/L and lipase was 1500 U/L .A An abdominal contrast-enhanced CT performed after 24 hours showed acute Balthazar C pancreatitis with

necrosis within the head and uncinate process, and a necrotic collection along the right paracolic gutter.

Along with intravenous hydration and WHO level II analgesia, a supportive treatment plan was started. After experiencing nausea and gastrointestinal pain throughout a five-day fast, the patient gradually resumed a low-fat diet and was discharged after 10 days .

Case 3

A 55-year-old non alcoholic male with hypertension showed signs of ST Myocardial infarction. Pharmaco - invasive approach was done. He was Thrombolysed with streptokinase and was taken for coronary angiography after 16 hours of thrombolysis. His left ventricular ejection fraction was 40%, and having hypokinesis of the anterior wall. His pre-op investigation revealed normal amylase and lipase values with normal liver and kidney function test His coronary artery scan revealed a 90% lesion in the LAD. The lesion was stented with drug-eluting.Dye used for the procedure was 110ml of Iohexol injection (350mg/1ml). After 48 hours, he developed severe epigastric pain. Medical management was done with pantoprazole infusion, however there was no symptom relief. He was kept Nil by mouth and ultrasonography was done which showed signs of acute pancreatitis. His amylase and Lipase were elevated . Serum amylase level was 800 U/L and lipase was 900 U/L. There was no other identified cause of pancreatitis. With routine hydration care, inotopic support, and supportive care, the patient recovered and discharged after ten days.

Discussion

In this instance, the question arose as to whether the contrast medium utilized during the intervention caused pancreatitis. This is a circumstance that we have never encountered, and although it has been seldom described, this topic is not well-discussed.[1-5] There are very rare instances of pancreatitis caused by contrast agents. The literature has only documented a small number of cases of pancreatitis caused by contrast agents.1-4 It is an uncommon angiography complication, with a potential frequency of less than 0.1%.

A possible mechanism suggests that the degree of pancreatic infarction caused by cholesterol emboli could be linked to pancreatitis and its severity. Several of these patients' autopsies have showed a notable hepatic embolisation of cholesterol.spleen and kidneys, which led to this theory.

Gorges [4] proposed a second mechanism in which the contrast agent causes impaired circulation, which is comparable to the pathophysiology of contrast-induced kidney damage and suggests that ischaemia brought caused by viscous contrast may be influencing the process by which pancreatic necrosis develops. This idea is reinforced by the observation that iodixanol is more likely to compared to iohexol, cause pancreatitis. This discrepancy may be connected to the differences between these two substances' viscosities and/or osmolality agents[5,6]. It has been demonstrated that iodixanol's comparatively increased viscosity when compared to other contrast agents significantly reduces tissue perfusion. Thus, the intravascular administration of iodixanol raises plasma reduces blood flow velocity and viscosity, which may induce pancreatic ischaemia, which results in necrosis[7] in our cases we used iohexol had been utilised in this instance.

As demonstrated in a recent study using a mouse model, it may cause inflammation in the pancreas by activating NF-κB, calcium signalling pathways, and cellular calcineurin [7-10]. Furthermore, because of its hyperviscosity, it might change the pancreatic microcirculation, albeit this mechanism is still debatable.[11-12]

We looked for and ruled out any indications of clinically evident cholesterol emboli based on examination of the ocular fundus as well as test results (lack of eosinophilia and renal failure). Nevertheless, cutaneous or renal biopsy continues to be the gold standard for this pathology. We might not formally exclude it because our patient did not have these procedures.

The administered product is a water-soluble, low osmolarity (290 mOsm/kg H2O) non-ionic iodinated contrast medium (i.e., the iodine is bonded to an organic substance) with a concentration of 350 mg/mL[7-10].It is noteworthy that in cases, the same kind of contrast agent was applied[2,3]. The other cases that were described used contrast material at dosages ranging from 80 to 160 mL. The typical amount needed during coronary angiography with stenting is between 80 and 120 mL. In our instance, the patient was given the usual dosage. As a result, dose-dependent adverse medication reactions are likely.

Conclusion

Although contrast-induced pancreatitis is an uncommon condition, one should be aware of this consequence given the frequency of cardiac and radiological procedures performed. It's crucial to address multiorgan failure, increasing creatinine, or abdominal pain. Mostly renal or other

symptoms could result in forgetting that acute pancreatitis is the root of the issue. CT is useful in evaluating the pancreas. Selection of less viscous contrast materials while preserving hemodynamic maintaining proper hydration and fluid balance when attending to sick individuals is crucial. Early diagnosis and supportive care are part of management.

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