

VICARIOUS RENAL EXCRETION OF ORAL IODINATED CONTRAST IN A PATIENT WITH PANCREATIC CARCINOMA

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PRESENTATION OF THE CASE

An 84 year old male presented with a history of chronic bladder outlet obstruction symptoms, painless jaundice, reduced appetite, weight loss & long-standing abdominal pain.

IMAGING FINDINGS

USG of abdomen and pelvis showed prostatomegaly with significant post-void residual volume, and an ill-defined heterogeneously hypoechoic lesion in the pancreatic head as compared to normal pancreas was noted causing upstream obstruction in the form of Intra Hepatic Biliary Radicals & Common Bile Duct dilatation and main pancreatic duct dilatation.

Dual phase CECT abdomen and pelvis were suggested. Renal function test was normal with serum creatinine level of 0.9 ml/dl and serum urea level of 22 ml/dl.

20 ml of iohexol (300 mgI/ml) in 1000 ml of water was given orally followed by 60 ml of iohexol intravenously.

Opacification of bilateral ureters (Figure 1) were noted with presence of contrast in the urinary bladder (Figure 2) of the patient following oral contrast before the administration of IV contrast (no prior contrast enhanced studies were done).

PP and PVP phases of post administration of IV contrast showed ill-defined minimally enhancing lesion as compared to surrounding normal pancreatic parenchyma, which was encasing superior mesenteric artery, common hepatic artery, celiac artery. The tumour was also invading duodenal wall (figure 3). This mass is causing intra hepatic biliary radicals, common bile duct and pancreatic duct dilatation (double duct sign).

There were few enlarged peripancreatic lymph nodes.

CLINICAL DIAGNOSIS

Biliary Obstruction with BPH.

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DIFFERENTIAL DIAGNOSIS (IMAGING)

- Pancreatic head carcinoma with vicarious renal excretion of oral contrast / fistulous tract between bowel and urinary bladder.
- Periapillary carcinoma with vicarious renal excretion of oral contrast / fistulous tract between bowel and urinary bladder.

PATHOLOGICAL DISCUSSION

*To the best of our knowledge, this is the first case report on vicarious renal excretion of orally administered iohexol contrast in a patient of pancreatic carcinoma with duodenal invasion. However, there have been a few instances of vicarious excretion of Gastrografin.

Iohexol is a non-ionic, iodinated, low osmolar, water soluble contrast medium which can be used as oral contrast and has neutral taste. It is a positive contrast and provides great visualization of gastrointestinal tract. It is eliminated through rectum and only 0.1 to 0.5% of the ingested oral contrast is absorbed from healthy and intact bowel, which cannot be demonstrated through renal excretion on conventional abdominal CT.

The contrast absorption can increase through unhealthy bowel.

In our case there is probably increased contrast absorption in blood stream leading to vicarious renal excretion of oral contrast. This increased absorption can be due to mucosal damage or inflammation caused by direct invasion of the pancreatic tumour into the duodenal wall.

Studies did earlier have shown vicarious renal excretion of oral contrast.

Halme et al. concluded that there is increase in permeation of iohexol through acute inflamed mucosa of the ileum in patients with Crohn's disease. Mucosal inflammation or other damage is strongly indicated, if there is more than 1% of excretion of iohexol in the urine.¹

Other studies done using Gastrografin contrast which is also water soluble, iodinated but high osmolar ionic oral contrast shows vicarious renal excretion of oral contrast.

Kyung et al. in their study concluded that intestinal absorption of enteral Gastrografin considerably increases in early postoperative patients after gastrointestinal surgery than in healthy subjects.²

They also said vicarious renal excretion of contrast may cause diagnostic error. Low et al. reported that vicarious renal excretion causes misinterpretation.^{2,3}

As in a case of a 68 year old man who had ultra-low anterior resection with temporary diverting ileostomy for rectal carcinoma. Six months later, when he was symptom free he came for reversal of diverting ileostomy. Routine contrast enema was performed and contrast was seen in the bladder. However, no leak or fistula was noted directly on the scan. So fistulous tract between the bladder and the rectum was diagnosed. On reviewing the CT they contrast in both ureters and kidneys on the scout view suggesting the vicarious renal excretion of absorbed colonic contrast. Then one month later he had a repeat Gastrografin enema which showed an intact colorectal anastomosis. Subsequently reversal of ileostomy was done.

Failure of recognition can lead to diagnostic misinterpretation and unnecessary delay in management.³

Apter et al in their study showed that the CT finding of orally ingested Gastrografin in the urinary tract differentiates patients with bowel disease from patient with healthy and intact bowel mucosa. Bowel disease like inflammatory bowel disease, radiation enteritis, ischemia and lymphoma of bowel can show increase absorption causing vicarious renal excretion.⁴

Many simple methods can be used to prevent misinterpretation of vicarious renal excretion. Meticulous attention towards the renal collecting system is an easy method and should be the first step in investigating such patients. The second way is to use diluted contrast.⁴

Mori et al. in their study of "Sign of intestinal perforation" said that opacification of the urinary bladder following ingestion of contrast occurs frequently in infants, but is not a usual finding in normal adult subjects.⁵

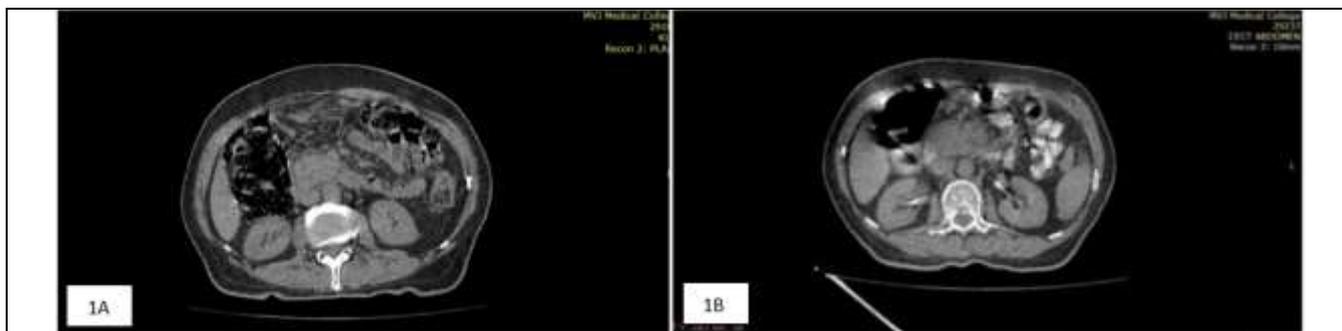


Figure (1A). Plain & 1B. Oral Contrast Axial Images Through Kidney. (1B). Shows Presence of Contrast in Bilateral Ureters Following Oral Contrast.



Figure (2A). Plain & 2B Oral Contrast Axial Images Through Urinary Bladder. (2B). Shows Presence of Contrast in Urinary Bladder Following Oral Contrast.

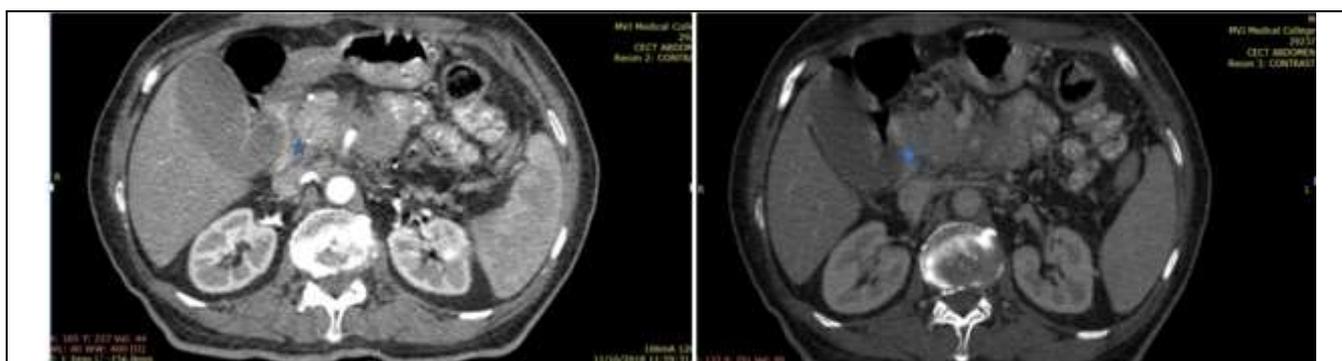


Figure 3. Axial Section Through Pancreas in Pancreatic Parenchymal Phase and Porto-Venous Phase Show Duodenal Wall Thickening (Star) as Causing Narrowing of Lumen

DISCUSSION OF MANAGEMENT

The vicarious renal excretion of the oral contrast should be meticulously examined to avoid unnecessary treatment.

The locally advanced pancreatic tumour which is encasing the celiac trunk should be given chemotherapy and radiotherapy.

FINAL DIAGNOSIS

Pancreatic head mass (Stage T4N1M0) with prostatomegaly. Incidental finding- vicarious renal excretion of oral contrast through kidneys.

CONCLUSIONS

In conclusion, the oral contrast absorption increases in unhealthy bowel due to mucosal damage or inflammation. So, if contrast is seen in bladder, following oral contrast, before considering fistula between bladder and bowel, we should meticulously study the images. Presence of contrast in renal excretory system suggests vicarious renal excretion of oral contrast and this vicarious renal excretion is mostly due to unhealthy bowel. However, in very few cases this vicarious renal excretion can be idiopathic.

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