Abstract:

CONTEXT
Groove pancreatitis often masquerades as pancreatic carcinoma. Clinically groove pancreatitis and pancreatic carcinoma share many common features. These uncommon pancreatic diseases with challenging imaging diagnosis can lead to surgical dilemma. The purpose of the study is to report the surgical dilemma in two cases presenting with pancreatitis and obstructive jaundice, and to review the current clinical radiological and pathological characterisation of pancreatic carcinoma and groove pancreatitis.

CASE REPORT
Two different cases presented with chronic abdominal pain with acute exacerbation, associated with nausea, vomiting and features of obstructive jaundice. They had similar clinical, radiological and pathological findings. A CT abdomen of them revealed hypodense mass lesion in the periampullary region for both. MRCP also shows similarity with paraduodenal wall cyst suggesting groove pancreatitis. Here, the surgical dilemma occurs with case 1, who has constantly progressive obstructive jaundice and elevated CA 19-9 values, highly suspicious of malignancy, hence proceeded with Whipples surgery. Surprisingly the histopathology turned out to be inflammatory. Case 2 was managed conservatively with proton pump inhibitors and supportive measures alone.

CONCLUSION
Groove pancreatitis often masquerades as pancreatic carcinoma. Several studies have been attempted to clarify the difference between carcinoma and pancreatitis in the groove area. The discrimination has been proved difficult considering only the imaging report of paraduodenal wall cyst and obstructive jaundice clinically. Definitive diagnosis can be obtained after surgical intervention in some. This should be considered when making differential diagnosis in pancreatic groove pathology and duodenal stenosis.
The purpose of this study is to report 2 cases of pancreatitis, their varied presentations and the diagnostic dilemma we came across in treating them. We further discuss the relevant radiological features which may help differentiate pathologies, which should form part of the differential diagnosis of any groove pathology.

CASE REPORT 1
A 57-year-old man, with a past history of chronic alcohol consumption, presented with epigastric pain radiating to the back, intermittent vomiting and a weight loss of 10 kg, for the past 2 years. There had been recurrent admissions due to abdominal pain over the past 4 months for which he was evaluated at various hospitals, treated as pancreatitis. His serum amylase ranged from 100 to 450 U/L (reference range: 0-220 U/L). Jaundice for past 2 months, which was progressive and showed no waxing and waning. He has loss of appetite and nausea for past 2 months. History of clay coloured stools and high coloured urine for 2 months. No history of altered bowel habits, no history of melena or hematochezia. Abdominal examination shows Tenderness in epigastrium, Liver was just palpable and Gall bladder not felt. On investigation showed elevated total bilirubin- 12 mg/dl and direct bilirubin -9 mg/dl. Liver enzymes (SGOT – 70 U/L, SGPT – 77 U/L and Alkaline Phosphatase – 298 U/L) was raised. Hypoalbuminemia (2.9 g/dl), Reversed A:G ratio (0.82) and Glucose intolerance was suspected of periampullary carcinoma. Upper gastrointestinal endoscopy revealed an edematous, shiny, reddish raised mucosa. The tumour marker serum carbohydrate antigen 19-9 (CA 19-9) was elevated-760 U/ml(normal upto 40 U/ml), suspicious of periampullary carcinoma.

The sections from the resected specimen showed a lymphnode 1.3 cm lymphnode in the portahepatis, features suggestive of GROOVE PANCREATITIS yet inconclusive. Diagnostic dilemma was due to Continuous progressive jaundice (DIRECT BILIRUBIN – 9 mg/dl). Markedly elevated CA 19-9 (760 U/ml), and on imaging studies carcinoma could not be ruled out. Since the patient was having repeated abdominal pain despite medical therapy, he was proceed with classical whipple’s pancreaticoduodenectomy.

Intra operatively an ill-defined mass was visualized in the head of pancreas, along with grossly dilated CBD. The rest of the pancreas appeared fleshy. Stomach bed appeared to be normal, no evidence of any enlarged nodes. The pancreaticoduodenectomy specimen was sent for histopathological examination. Histopathology shows clusters of acini and islet cells arranged in a closely packed pattern separated by dense fibro collagenous tissue in the head of pancreas. The sections from duodenum show normal mucosa, muscle layer shows focal areas of infiltration by the collections of pancreatic acini. There is no evidence of atypia or malignancy. Impression : Focal Chronic pancreatitis, negative for malignancy.

The patient had an uneventful recovery and he is on conservative medical management with analgesics, proton pump inhibitors and a pancreatic enzyme supplement. He has mild intermittent abdominal pain at irregular intervals. He has not consumed alcohol for the past year and is being regularly followed.

CASE REPORT 2:
A 38 year old male alcoholic for 10 years, presented with severe abdominal pain for 2 days, frequent vomiting and weight loss of about 8 kg in recent past. Abdominal pain is more localised to epigastric and umbilical region, radiating to back. His serum amylase was 333 SU/dl(0-220) and bilirubin was 4.5 mg/dl. Ultrasound of the abdomen shows mild dilatation of IHBR. CBD at the porta hepatis measures 9 mm. A cystic structure measuring 6.5 x 5 cm with multiple septations in relation to the lateral aspect of the head of pancreas and also involving the medial wall of second part of duodenum with intra mural cystic collections [fig.1]. The linear intramural component measures about 3.4 x 1.6cm and the rounded periampullary intramural component about 2 x 2 cm. These collections show significant wall enhancement on delayed images. A few enlarged lymphnodes are seen in the peripancreatic region with a few enlarged lymphnodes are seen in the peripancreatic region with a lymphnode 1.3 cm lymphnode in the portahepatis, features suggestive of GROOVE PANCREATITIS yet inconclusive. Diagnostic dilemma was due to Continuous progressive jaundice (DIRECT BILIRUBIN – 9 mg/dl). Markedly elevated CA 19-9 (760 U/ml), and on imaging studies carcinoma could not be ruled out. Since the patient was having repeated abdominal pain despite medical therapy, he was proceed with classical whipple’s pancreaticoduodenectomy.

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Groove pancreatitis is a condition that involves inflammation and cancerous infiltration of the submucosal space between the pancreatic head and duodenum. This condition is often diagnosed in men aged 40-50 years, with a history of alcohol excess in the majority of cases. The initial presentation includes postprandial abdominal pain, which is a common symptom. Investigations usually include endoscopy (with or without EUS) and cross-sectional imaging (CT and MRI). The histopathological hallmark of groove pancreatitis is the presence of scar tissue and fibrosis in the pancreaticoduodenal region, which can lead to adequate weight gain. Surgery is often required because of the severity of the clinical symptoms and in order to rule out malignancy. The surgical treatment of choice is a pancreaticoduodenectomy using the Whipple procedure or a pylorus-preserving pancreaticoduodenectomy. Gross examination of the surgical specimen usually shows an abundant whitish firm mass of the groove area stenosing the terminal common bile duct. The histopathological hallmark of groove pancreatitis is the presence of scar tissue with fibrosis in pancreaticoduodenal groove or in the groove and the superior portion of the pancreatic head (in the pure and segmental forms of the disease, respectively). Histologically, groove pancreatitis causes either thickening or scarring of the duodenal wall, particularly in the area corresponding to the minor papilla, that extend to the adjacent pancreatic head tissue and/or sieve-like cystic changes in the duodenal wall. The cysts contain clear fluid, but others may have more granular white material and even stones. The fibrotic tissue that develops in the wall of the pancreas, also involves the groove between the wall and the pancreatic tissue may compress and indent the common bile duct. Conservative measures including analgesics, pancreatic rest, and abstinence from alcohol are usually successful at treating initial symptoms, but may not be long-lasting. Effectiveness of conservative management should be reassessed regularly according to symptoms, imaging and biochemical results. Endoscopic drainage of a stenotic or occluded via the minor duct has been reported with good initial results. The presence of intractable pain and/or pancreatic insufficiency (weight loss, steatorrhoea or diabetes), can be attributed to the severe inflammatory and fibrotic changes observed in the head of pancreas often associated with duodenal obstruction secondary to scarring or cystic dystrophy. Occasionally, groove pancreatitis is resistant to medical treatment and follows prolonged course, so surgical intervention in the form of a pancreaticoduodenectomy [5] may be required at a late phase of the disease, resulting in symptomatic relief and can lead to adequate weight gain. Surgery is often

**Table 1. RADIOLOGICAL DIFFERENTIATION BETWEEN GROOVE PANCREATITIS AND PANCREATIC HEAD**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Description</th>
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<tbody>
<tr>
<td>MRCP</td>
<td>Sheet like mass between head of pancreas and C-loop of duodenum. Hypointense on T1 weighted images and can be hypo-, iso- or slightly hyperintense on T2 images.</td>
</tr>
<tr>
<td>CT</td>
<td>In the pure form of the disease a poorly enhancing plate-like hypodense lesion can be identified between the pancreatic head and the duodenum, near the minor papilla.</td>
</tr>
<tr>
<td>EUS</td>
<td>Hypoechoic area between duodenal wall and pancreatic parenchyma, duodenal stenosis and smooth common bile duct stenosis.</td>
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</tbody>
</table>

**Fig.3 Mildly dilated mid pancreatic duct and inflammatory thickening of subjacent “c” loop of duodenum**

Groove pancreatitis can be treated by conservative medical measures, but surgery is often required because of the severity of the clinical symptoms and in order to rule out malignancy. The surgical treatment of choice is a pancreaticoduodenectomy using the Whipple procedure or a pylorus-preserving pancreaticoduodenectomy. Gross examination of the surgical specimen usually shows an abundant whitish firm mass of the groove area stenosing the terminal common bile duct. The histopathological hallmark of groove pancreatitis is the presence of scar tissue with fibrosis in pancreaticoduodenal groove or in the groove and the superior portion of the pancreatic head (in the pure and segmental forms of the disease, respectively). Histologically, groove pancreatitis causes either thickening or scarring of the duodenal wall, particularly in the area corresponding to the minor papilla, that extend to the adjacent pancreatic head tissue and/or sieve-like cystic changes in the duodenal wall. The cysts contain clear fluid, but others may have more granular white material and even stones. The fibrotic tissue that develops in the wall of the pancreas, also involves the groove between the wall and the pancreatic tissue may compress and indent the common bile duct. Conservative measures including analgesics, pancreatic rest, and abstinence from alcohol are usually successful at treating initial symptoms, but may not be long-lasting. Effectiveness of conservative management should be reassessed regularly according to symptoms, imaging and biochemical results. Endoscopic drainage of a stenotic or occluded via the minor duct has been reported with good initial results. The presence of intractable pain and/or pancreatic insufficiency (weight loss, steatorrhoea or diabetes), can be attributed to the severe inflammatory and fibrotic changes observed in the head of pancreas often associated with duodenal obstruction secondary to scarring or cystic dystrophy. Occasionally, groove pancreatitis is resistant to medical treatment and follows prolonged course, so surgical intervention in the form of a pancreaticoduodenectomy [5] may be required at a late phase of the disease, resulting in symptomatic relief and can lead to adequate weight gain. Surgery is often
required to definitively rule out a pancreatic neoplasm. This type of pancreatitis has been reported under various names in the literature including paraduodenal pancreatitis, cystic dys trophy of heterotopic pancreas, pancreatic hamartoma of duodenum myoadenomatosis and peri-ampullary duodenal wall cyst. Groove pancreatitis is classified as a rare disease, but this might be partly due to lack of awareness of this condition.

CONCLUSION:
The differential diagnosis for groove pancreatitis depends on whether the pure form or the segmental form is being considered. The most important diagnostic option in the differential diagnosis for the segmental form is pancreatic adenocarcinoma. The imaging characteristics of these two entities may overlap considerably. In particular, owing to its significant fibrous component, the scirrhous variant of pancreatic adenocarcinoma may demonstrate delayed enhancement similar to that shown by groove pancreatitis. The presence of vascular invasion is considered to be the most useful sign in differentiating pancreatic carcinoma from groove pancreatitis. MR cholangiopancreatography may reveal a smooth stricture of the distal intrapancreatic portion of the bile duct in patients with groove pancreatitis, as opposed to an abrupt irregular ductal stricture in patients with pancreatic carcinoma. A variety of pancreatic lesions may mimic the pure form of groove pancreatitis. These lesions include groove carcinoma, duodenal or periampullary carcinoma, pancreatic groove neuroendocrine tumors, and acute pancreatitis with inflammatory changes in the groove [4]. Differentiation from pancreatic groove carcinoma is almost impossible on the basis of clinical and imaging features alone, although the presence of cystic lesions within the mass or a thickened duodenal wall would favor a diagnosis of groove pancreatitis. Groove pancreatitis often masquerades as pancreatic head carcinoma. This condition should be kept in mind when making the differential diagnosis between pancreatic masses and duodenal stenosis. In all cases of focal pancreatitis involving the head or uncinate process of the pancreas with involvement of the adjacent duodenum, the possibility of groove pancreatitis should be considered.

References