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Case Series

Case series- study of pancreatic lesions and it's management in a rural tertiary healthcare centre

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ABSTRACT

Introduction: Pancreatic cancer (PC) is a rising public health threat and is anticipated to account for over 48,000 cancer-related deaths by 2030. Significant advances in surgical technique have resulted in decreased perioperative morbidity and mortality after pancreatic resection. Management includes a multi modality program with neoadjuvant therapy and surgical resection.

Inflammatory tumors, cystic and neuroendocrine neoplasms, and periampullary adenomas are other growing entities of pancreatic diseases. Patients present with symptoms of epigastric tenderness, jaundice, nausea, vomiting.

Many surgical procedures have been proposed for periampullary tumors; these range from palliative bypass of the biliary and gastrointestinal tracts, local excisions, total pancreatectomy, and traditional pan creatoduodenectomy or the Whipple procedure. Each of these various procedures has been designed to answer a problem with postoperative mortality, long-term gastrointestinal function, or long-term survival.

Aim: To study clinical features and management of pancreatic lesions over a course of 1 year in a rural tertiary health care set up.

1. Methodology

Records of 6 patients were studied retrospectively who presented with pancreatic lesions over a course of 1 year. Following data collected including symptoms on presentation, pre operative diagnostic modalities, lab values, operative intervention done and condition at time of discharge.

2. Case 1 70yr/ male

Complaints of abdominal pain, jaundice, loss of appetite, weight loss – 4 months. Patient was also a known case of DM type 2.

2.1. Pre-operative investigations

Nov 2022 USG- Dilated CBD measuring 12.4 mm with echogenic focus in distal portion of CBD measuring 10mm s/o extrahepatic Choledocholithiasis with IHBR dilation Dec 2022 CECT Abd+ Pelvis – Iso enhancing Soft tissue area seen in the head of pancreas measuring 2.1 x 1.9 cm causing narrowing of distal CBD, MPD at the periampullary region. CBD 16mm CHD measures 18mm right duct 10mm left duct 11mm MPD measures 10mm, there is atrophy of rest of body and tail of pancreas. Fat planes with surrounding structures appears normal s/o Neoplastic mass lesion involving head of pancreas.

2.2. Labs

Serum Lipase 73.7 (5.6 to 51.3)
LFT ALP 356 DBIL 23 TBIL 25

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2.3. Procedure-Whipple's Pancreaticoduodenectomy

Post op HPR- Pancreatic Ductal Adenocarcinoma. No lymphovascular or Perineural invasion seen. All margins free of tumor. Adjacent pancreas shows changes of chronic pancreatitis. 11 Lymph nodes identified, all free of tumour

Post op complication- uncontrolled fasting and post prandial blood sugar levels from POD 6.

Discharged on POD 17.

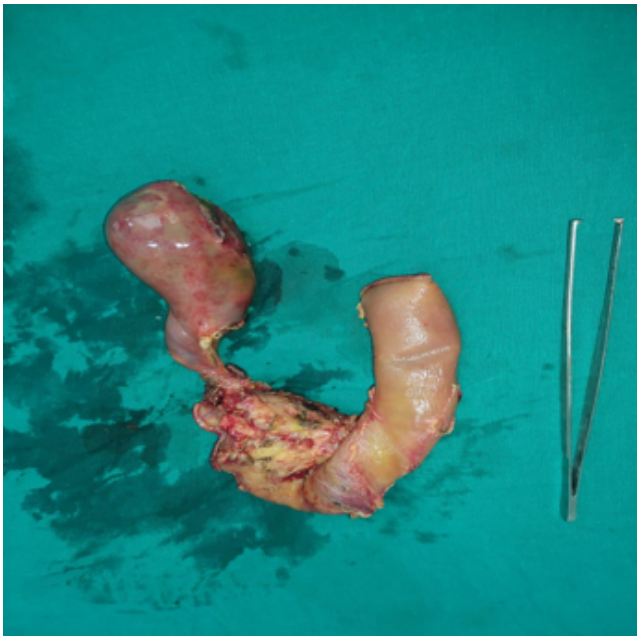

Figure 1:

3. Case 2 39yr / female

Complaints of abdominal pain, severe nausea , jaundice, loss of appetite since three months.

3.1. Pre-operative investigations

Feb 2023 ERCP- SVE passed to D2. Large ulcerated papilla seen with involvement of adjacent duodenal mucosa. Biliary sphincterotomy done and biopsy taken from papilla.

3.2. Pre op Biopsy- Pancreatic heterotropia with chronic non-specific inflammation

Prior to sphincterotomy, patient had clinical features of obstructive jaundice with Total Bilirubin – 16 and Direct Bilirubin -12.

Feb 2023 CECT Abd+ Pelvis -Ill-defined 2.5x2.4x2.8 cm heterogeneously enhancing soft tissue mass lesion in peri ampullary region. Fat planes with surrounding structures- duodenum and pancreas appears relatively indistinct Findings s/o Neoplastic Mass lesion. IHBR dilated. Main pancreatic duct measures 4mm. No focal lesions seen.

Jan 2023 MRCP Ill-defined lesion in periampullary region measuring 2.0x 2.4 x 2.8 cm with resultant upstream dilation. Pancreatic duct 3mm, CBD 14mm, CHD right and left hepatic duct, cystic duct and intra hepatic biliary radical with abrupt cut off of CBD and pancreatic duct noted giving double duct sign s/o neoplastic mass lesion in periampullary region.

3.3. Labs

Seum Amylase 353 Ca 19-9 2212 (less than 37).

LFT ALP 72, D BIL 0.7 T BIL 1.1.

3.4. Procedure- whipple's Pancreaticoduodenectomy

Post op Biopsy- Moderately differentiated Pancreatic Ductal Adenocarcinoma. All margins, pancreatic duct, CBD, Uncinate process, proximal and distal resection margin, posterior surface of pancreas free of tumor. Adjacent pancreas- changes of chronic pancreatitis, Total 16 Lymph nodes identified- free of tumor.

Post operative complications – Wound gape on POD 15. Followed up for a period of 1 year with chemotherapy. No Evidence of recurrence in follow up period.

Discharged on POD 22.

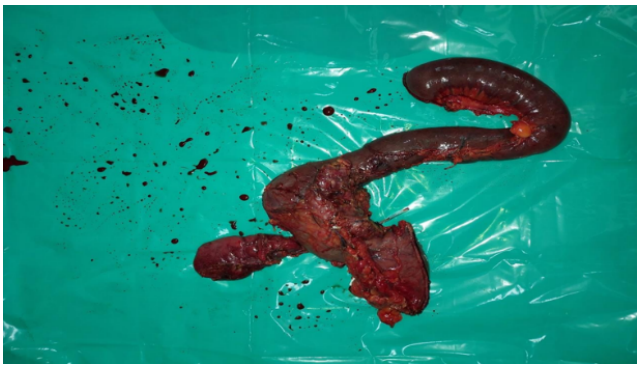

Figure 2:

4. Case 3 74 yr/ male

Complaints of abdominal distension, recurrent episodes of constipation and loss of appetite since 2 months. No signs of jaundice or clinical features of abdominal pain, vomiting or loss of weight.

4.1. Pre-operative investigations

Sept 2023 CECT Abd+Pelvis- 1.75 x1.75 x2.7 cm heterogeneously enhancing soft tissue density mass lesion noted arising from periampullary region involving head of pancreas causing resultant upstream dilatation of Indra and

extra hepatic biliary system. Main pancreatic duct appears dilated and measures 4mm giving double duct sign s/o periampullary neoplastic lesion.

4.2. Labs

CEA 5.34

CA 19-9 5.06

LFT T BIL – 24 D BIL 20 ALP 300

Per cutaneous trans hepatic biliary drainage with biliary stenting done.

Post procedure LFT. T BIL- 9.2, D BIL- 7.4 ALP- 263.

Patient planned for Whipple's Pancreaticoduodenectomy 4 weeks after stenting as definitive treatment. Intraoperatively multiple adhesions seen around pancreas and biliary stent following which surgical plan was changed. Pancreas could not be resected and patient underwent Cholecystojejunostomy with Gastrojejunostomy.

POD 7- Leak around gastro-jejunostomy anastomosis with burst abdomen. Drain output was monitored and anastomotic leak was conservatively managed as it was low output. Patient was started on total parenteral nutrition to allow anastomosis to heal and secondary suturing of wound gape was done.

5. Case 4 41 yr/Male

Complaints of diffuse abdominal pain radiating to back, loss of weight since 1 year and persistent nausea and vomiting since 2 months. No signs of jaundice seen.

5.1. Pre-operative investigations

May 2023 USG-Pancreas appears heterogenous. There is e/o 3.5 x 2.7 cm sized anechoic cystic structure noted arising from head and body of Pancreas. Likely s/o pseudocyst of pancreas.

May 2023 CECT Abd + pelvis- Pancreas head measures 25mm, body measures 18mm and tail measures 16mm. There are few encapsulated well-defined hypodense lesions noted arising from head and uncinate process, largest measuring 37 x 31 mm. Findings likely s/o mucinous cystadenoma.

5.2. Labs

BIL -1 0 D BIL- 0 6 ALP -150.

Serum Lipase 356.

Procedure Patient was planned for Whipple's pancreaticoduodenectomy but intraoperatively resection of pancreas had to be abandoned as entire pancreas from head to tail was firm, atrophic with small mass palpable near superior border of pancreas. Changes suggestive of Chronic pancreatitis. Diffuse oozing is seen all over abdominal cavity. Dense adhesions and fibrosis palpated at the porta hepatis during kocherization, no virgin planes were found with IVC and aorta.

Patient treated for chronic pancreatitis and discharged on POD 14.

6. Case 5 62Yr/ Female

Complains of abdominal pain limited to epigastric region since 1 year. No other significant clinical features such as loss of weight, jaundice, vomiting seen.

6.1. Pre-operative investigations

October 2023 CECT – Evidence of 4.6x5.8x8.9 cm heterogeneously enhancing soft tissue density mass lesion in uncinate process causing indentation over SMA posteriorly causing compression over inferior vena cava, Fat planes with 2^{nd} and 3^{rd} duodenum appears lost, superiorly involving distal part of CBD with its proximal dilatation 11mm. No IHBR dilation. Findings s/o Neoplastic mass lesion.

Preop Biopsy - Serous Cystadenoma.

IHC positive for CK, CK7, Inhibin.

Negative for CK 20, CA 19-9.

6.2. Labs

Serum Amylase 55.

LFT TBIL- 0.6 D BIL- 0.3 SGOT 19 SGPT 16 ALP-97.

6.3. Procedure – whipple's Pancreaticoduodenectomy

Post op HPR – Serous Cystadenoma. External surface of Pancreas appears completely obliterated with multicystic mass measuring 7x6.5x4 cm – serous fluid present within cyst. 6 lymph nodes identified all free of tumor. Pyloric proximal resection margin, jejunal distal resection margin CBD and pancreatic duct margin all free of tumor.

6.4. Post operative complications- biliary gastrits

Discharged on pod 14. Endoscopy on POD 60 suggestive of biliary reflux gastritis with approx. 150 ml bile reflux in stomach Patient had to undergo diversion jejunojenostomy for resolution.

7. Case 6 78y/F

Complaints of pain in abdomen and nausea following consumption of meals since 2 months.

7.1. Preoperative investigations

May 2023 CECT Abd+ Pelvis- 10.0x9.1x9.0 cm cystic lesion extending from D11 to L2 vertebral levels having indistinct margins with pancreatic tail reaching upto greater curvature of stomach superior-anteriorly, displacing splenic vein and left renal vein posteriorly, jejunal loops medially and colon laterally.

Figure 3:

7.2. Labs

LFT T Bil- 0.8 D Bil 0.6 ALP 70.

7.3. Procedure

Distal pancreatectomy with splenectomy – Intraoperatively 10x11 cm cyst seen arising from tail of pancreas which was adherent to mesentery and splenic vessels.

Post op Biopsy- Well differentiated neuroendocrine tumor showing fibrocollagenous cyst wall lined by gastric type of columnar epithelium without atypia. The subepithelium show areas of haemorrhage, congested blood vessels and fibrosis with residual pancreatic tissue.

Patient discharged on POD 8.

8. Result

6 patients presented to our rural tertiary health care centre with clinical symptoms ranging from abdominal pain, weight loss, vomiting and endocrine dysfunction. All 6 patients were evaluated using multimodality approach-Radiological investigation such as Contrast enhanced CT scan, endoscopic biopsy, tumor markers – CEA and Ca19-9. Each patient was individually assessed and selected for operative intervention. 3 Patients underwent Whipple's pancreatic duodenectomy, 1 Patient underwent Distal pancreatectomy with splenectomy, 1 patient underwent Biliary stenting followed by Cholecystojejunostomy with Gastrojejunostomy. 1 patient was planned for resection but procedure changed due to intraoperative findings of chronic pancreatitis with fibrosis, Out of 6 cases operated, two were positive for Adenocarcinoma Pancreas, 1 positive for Pancreatic Neuroendocrine tumor. Incidence among males was found to be equal to females.

3 Patients diagnosed as Adenocarcinoma pancreas, Pancreatic Neuroendocrine tumor and Serous Cystadenoma and followed up for a post operative period of 90 days. 2 patients where pancreas could not be resected were followed up for a post operative period of 30 days.

0% mortality in the above period.

9. Discussion

Primary concern in management of pancreatic lesions is appropriate selection of patients for surgical intervention as procedures such as Whipple's pancreaticoduodenectomy, distal pancreatectomy carry major post operative morbidity in itself. If selected carefully perioperative mortality should be less than 2%.[1]

Recent advances in surgical technique, anaesthesia, and critical care have resulted in pancreaticoduodenectomy now being considered a very safe operation when performed at major referral centres by experienced surgeons.

Pancreaticoduodenectomy was first formally described by Whipple, Parsons, and Mullins in 1935 in the Annals of Surgery. Preoperative evaluation should include a detailed history and physical examination (including functional status), chest imaging, laboratory studies including tumor markers CA 19-9 and CEA , contrast-enhanced pancreas-protocol computed tomography (CT) of the abdomen. Patients are there classified into one of four categories based on appropriately performed CT imaging: (1) resectable, (2) borderline resectable, (3) locally advanced (now to include type A and type B), and (4) metastatic.[2]

Periampullary tumors include adenocarcinomas of the pancreatic head, duodenum, ampulla of Vater, and lower bile duct . Carcinoma involving the head of the pancreas, the distal 12 cm of the common bile duct, the ampulla of Vater, or the duodenal mucosa adjacent to the papilla of Vater have in common a similar history, mode of diagnosis, and method of treatment. Hence early diagnosis is primal in management and selection of patients for surgery

The possibility of tumor should always be considered in patients with unexplained fatigue, nausea, abdominal pain, and loss of weight. Pain and jaundice coexist as symptoms in more than half the patients with periampullary lesions.[3] The pertinent physical findings in resectable periampullary carcinoma 'are jaundice, hepatomegaly, and mild epigastric tenderness. As demonstrated in the aforementioned six cases- all 6 patients presented with abdominal pain limited

to epigastric and right hypochondrium. Jaundice seen in 2 out of 6 patients.

Diagnosis of pancreatic/ periampullary carcinoma cannot be ruled out in patients without palpable gall bladder. One fourth of patients present with palpable gall bladder in the presence of painless jaundice.[4] Only one out of 6 patients presented with palpable gall bladder in our set up. The gallbladder may not be palpable because of hepatomegaly or because of scarring from previous inflammation. Slowly, the traditional clinical picture of painless jaundice with a palpable gall-bladder in carcinoma of the head of the pancreas is being eradicated.

Resectability of tumor also depends on location. Carcinoma of Ampulla of Vater, distal bile duct and duodenum have higher resectability rate than carcinoma of head of pancreas. Tumors in these areas are susceptible to surgical cure with a low operative mortality, while the cure rate in carcinoma of head of pancreas is low Resection of all periampullary tumors is recommended, with the Whipple operation being the standard in most cases. The best treatment for these tumors is pancreatoduodenectomy or palliative bypass if the tumor has spread beyond the region encompassed by resection.[5] 2 Patients with Adenocarcinoma of head of pancreas underwent Pancreaticoduodenectomy. 1 Patient underwent palliative bypass- Cholecystojejunostomy with gastrojejunostomy as pancreas was inoperable. Long duration of symptoms does not indicate non resectability.

Diagnosis is made using Contrast enhanced CT scan of abdomen, Endoscopic retrograde cholangio pancreateography or magnetic resonance cholangiopancreatography

CT scan allows to assess the relation of tumor to SMA, SMV and Hepatic artery. Pancreatic protocol CT helps to identify primary tumor, define tumor-vascular relationship including encasement/abutment of vessel and detect metastatic disease. No correlation seen between presence of pain in abdomen / back and adherence of tumor to blood vessels.

Complications include- Pancreatic and Biliary fistula leading to gastro intestinal , intra-abdominal haemorrhage / sepsis. Most frequent late complications include- diarrhoea, diabetes, benign stenosis of Biliary intestinal anastomosis , obstruction of Gastrojejunostomy, biliary gastritis, endocrine dysfunction and gastric dumping syndrome. Upper gastrointestinal obstruction is a late complication mostly caused by failure of adequate gastric resection and vagotomy.[6]

Since pancreatic anastomoses is the most precarious, it is telescoped to the end of a jejunal loop. In case pancreatic fistula develops it is less likely to drain activated pancreatic enzymes since pancreas has been placed at the end of a dysfunctional limb of jejunum.[7] As much as possible the common bile duct has to be resected since carcinoma can infiltrate along the duct and periductal lymphatic drainage.[8] Care was taken to include CBD in resection.

In 3 cases where gall bladder was not needed for anastomosis , cholecystectomy was done. Removal of sphincter of oddi disturbs intrabiliary pressure mechanism which will occur in gall bladder leading to likely formation of stones.

In patients who underwent pre-operative ERCP bile duct dissection was difficult, because of excessive adhesions around the bile ducts, which might be due to the body's response to the contrast during cholangiography.[9] Biliary stenting done in 1 out of 6 patients also led to difficult dissection as it acts as a foreign body leading to production of inflammatory process around the area.

Another category of Pancreatic lesions include Cystic lesions of pancreas which are being identified more frequently but are less likely to present with concerning features of malignancy.[10] Pancreatic neuroendocrine tumors (PNETs) arise from hormone-producing cells of the pancreas and account for 3-5% of all pancreatic malignancies. The majority of PNETs (75-90%) do not secrete a hormone and are therefore categorized as non-functional. Functional PNETs can secrete a variety of peptide hormones. Nonfunctional PNET's are associated with few symptoms and are diagnosed at a later stage either incidentally or during evaluation of unrelated medical conditions. Patients present with complaints of abdominal pain, jaundice, newly diagnosed DM, pancreatic duct obstruction.

The optimal diagnostic modality for accurately diagnosing PNETs is a pancreatic protocol computed tomographic (CT) scan. This helps characterize vascular involvement, staging, aberrant arterial anatomy, pancreatic and biliary duct abnormalities, and adjacent organ involvement. Pathological examination through biopsy obtained using endoscopic ultrasound (EUS) is the gold standard.

Despite the increasing availability of options for the management of PNETs, including somatostatin analogs, temozolomide-based chemotherapy, targeted therapies (e.g., sunitinib, everolimus), NANETS and the ENETS guidelines recommend surgical resection for non-functional PNETs >2 cm as they are associated with a higher probability of lymph node involvement, poor tumor differentiation, metastasis, and worse outcomes even if it means a radical operation with resection of adjacent organs and vascular reconstruction.[11]

Therefore, determining timing of surgical management for these patients is crucial. There are several factors that determine the applicability of surgical treatment for PNETs, which include tumor staging, differentiation, size, functionality, and location. Jaundice in a patient with cystic lesion of head of pancreas qualifies for resection. 1 out od 6 patient presented with lesion over tail of pancreas

Standard pancreatic resection with lymph nodes dissection, including pancreaticoduodenectomy and distal pancreatectomy, is the standard non-conservative surgical treatment for pancreatic tumours. However, these are extensive surgical procedures associated with non-negligible morbidity and an impaired pancreatic exocrine (9–60% of cases) and endocrine function (7–35%). Spleen preserving distal pancreatectomy has been associated with more favourable outcome compared to distal pancreatectomy with splenectomy. [12]

The management of pancreatic cystic lesions often represents a challenge to the clinician considering their indolent nature. The main concern with cystic lesions to determining whether or not malignancy is present and if the lesion should be resected surgically. [13]

10. Conclusion

As demonstrated in our rural tertiary setup with early identification of symptoms, use of appropriate diagnostic modality such as CT scan, judicious patient selection, surgical expertise and prompt post operative care, procedures involving resection of pancreas such as Whipple's pancreaticoduodenectomy which are known to carry a mortality of 3.6 percent can be performed successfully.

11. Source of Funding

None.

12. Conflict of Interest

None.

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