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Whipple Procedure: A Surgical Challenge

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Abstract: The Whipple procedure, also known as pancreaticoduodenectomy, is an extensive surgical procedure carried out to manage cases of pancreatic head cancer, periampullary carcinoma, and other lesions, both malignant and benign, involving the pancreas, duodenum, and bile duct. The procedure entails the removal of the pancreatic head, duodenum, gall bladder, and part of the bile duct, often incorporating a partial gastrectomy. This is followed by reconstruction of the gastrointestinal tract to restore continuity. Even though it poses substantial risk to the patient's wellbeing because of its technical complexity, and carries a high complication rate, it still offers the best cure for resectable tumors of the pancreatic head and adjacent areas, providing the sole chance for prolonged survival in these cases. Improvement in surgical access, perioperative care, and patient stratification have greatly enhanced results over the years.

Keywords*: Pancreatic Duodenectomy, Pseudo-Papillary Neoplasm.*

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I. INTRODUCTION

Pancreatic solid pseudopapillary neoplasm (SPN) is a low-grade malignant, rare tumor that occurs mostly in young women and has a good prognosis if it is resected surgically. While SPNs may occur anywhere in the pancreas, those occurring in the head of the pancreas might require a Whipple procedure (pancreaticoduodenectomy) to achieve complete removal. The Whipple procedure includes the resection of the pancreatic head, duodenum, portion of the bile duct, gallbladder, and sometimes a segment of the stomach, with subsequent complicated gastrointestinal reconstruction. Due to the indolent course and low metastatic ability of SPN, curative surgical resection is the primary treatment. The choice to undertake a Whipple procedure is determined by tumor size, site, and extension to adjacent organs. With proper surgical treatment, including the Whipple procedure where necessary, SPN patients can look forward to great long-term survival.

II. CASE REPORT

A 26-year-old female presented with a complaint of abdominal pain for the last three months. During evaluation, the patient had a contrast-enhanced CT scan which showed a well-encapsulated mass of 5 × 7 × 5 cm in the head of the pancreas. The lesion contained solid and cystic components with a peripheral solid rim and a centrally placed cystic area, being suggestive of a mixed-density mass.

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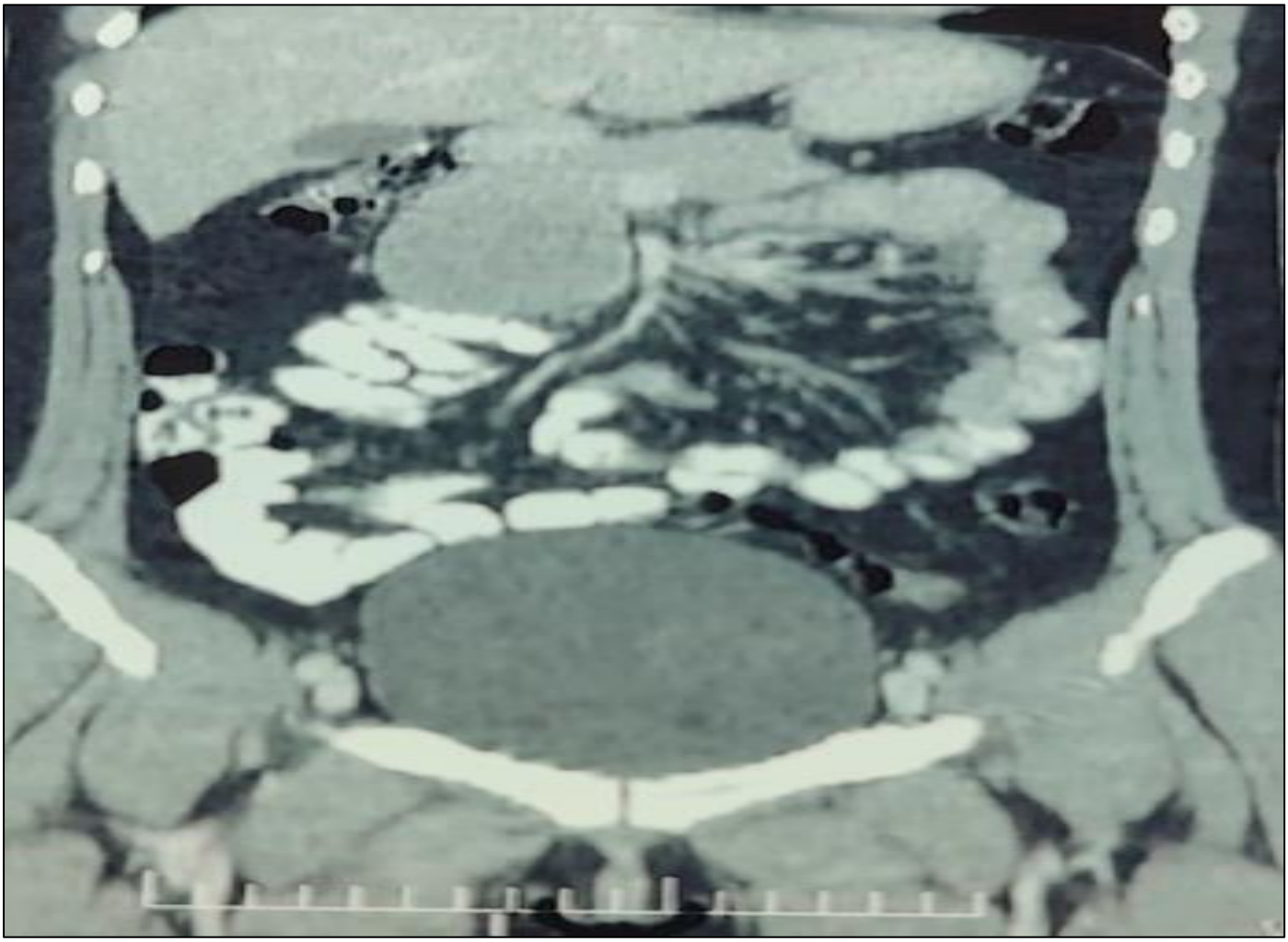

Fig 1 CT scan Showing Solid Pseudopapillary Neoplasm of Pancreatic Head

A CT-guided fine needle aspiration cytology (FNAC) of the lesion suggested a low-grade malignant neoplasm, consistent with a solid pseudopapillary neoplasm of the pancreas.

III. METHOD

After pre-operative optimization and adequate bowel preparation, patient was taken for whipple procedure.

- *Incision and Exposure*

The operation starts with a bilateral subcostal incision, followed by the use of a self-retaining retractor to maximize exposure. A Kocher maneuver is used to mobilize the duodenum and pancreatic head out of the retroperitoneum. Thin adhesions between the pancreatic head and inferior vena cava (IVC) are divided to expose the origin of the left renal vein. Proximity of the tumor to the superior mesenteric artery (SMA) and celiac trunk is determined by palpation. Mobilization of the hepatic flexure to the extent of one-half allows mesocolic structures to be peeled off the anterior pancreatic surface .The lesser sac is approached after incising the gastrocolic omentum lateral to the gastroepiploic arcade, and the pancreas is exposed anteriorly. Retrogastric adhesions are cut to mobilize the stomach, and the transverse mesocolon is separated from the anterior surface of the pancreas without violating the mesocolic tissue plane.

- *Cholecystectomy and Hepatoduodenal Ligament Dissection:*

Dissection continues through the hepatoduodenal ligament with the portal triad contained within it. The lymph node overlying the common hepatic artery (CHA) is a landmark. The CHA is then dissected towards the hepatic hilum, to expose and isolate the gastroduodenal artery (GDA). Following verification of satisfactory hepatic arterial flow through test clamping, the GDA is ligated and transected to reveal the portal vein (PV). The PV is dissected towards the right and the common bile duct (CBD) towards the left. The CBD is surrounded by surrounding fibrofatty and lymphatic tissues.the common hepatic duct was dissected with the help of 2 bulldog clamps. The duct is temporarily closed to avoid bile leak. Dissection proceeds along the PV towards the pancreatic head, including nodal tissue associated with it.

- *Formation of Retro Pancreatic Tunnel*

The middle colic vein is located and followed to where it joins the superior mesenteric vein (SMV), or the right gastroepiploic vein is followed proximally. The veins sometimes converge to become the trunk of Henle. The

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SMV is carefully separated from the posterior surface of the pancreatic neck to form a retro pancreatic tunnel. The cranial end of the tunnel is finished by dividing the PV from the pancreatic neck, joining it to the previous dissection.

➢ *Jejunogastric Division*

The transverse colon is elevated to make the ligament of Treitz visible, at which point jejunum 10–15 cm below the ligament is divided using a linear stapler. The ligature of jejunal mesentery is continued stepwise till the ligament of Treitz so that jejunal limb is passed into supramesocolic compartment. On clearing the omentum off the stomach wall, the lower part of stomach is divided with a linear stapler.

➢ *Pancreatic Division and Specimen Resection*

Stay sutures are engaged at the superior and inferior pancreatic border at the site of planned transection. Pancreatic parenchyma is transected with sharp transection or electrocautery, with care in hemostasis. Pancreatic head and uncinate process are dissected from the SMV with careful ligation or clipping of venous tributaries. The dissection is carried medially until the uncinate process is released from the lateral border of the SMA. The specimen is then dissected out and sent for histopathological examination. Hemostasis is achieved prior to reconstruction.

➢ *Pancreatic Reconstruction*

Reconstruction consists of three important anastomoses to reestablish gastrointestinal and biliary continuity:

- *Pancreaticojejunostomy:*

A loop of jejunum is taken into the supramesocolic compartment through a mesocolic window. A duct-to-mucosa anastomosis is formed between pancreatic duct and jejunal mucosa. The procedure varies according to duct diameter, pancreatic texture, and operator preference, with the goal of a tension-free well-perfused anastomosis.

- *Hepaticojejunostomy:*

An anastomosis is created between the jejunum and bile duct using the same jejunal limb in a side-to-side manner. This is normally performed with interrupted or continuous sutures in one layer.

- *Gastrojejunostomy:*

A portion of the distal limb of the jejunum is brought in an antecolic fashion to the stapled stomach end. Anastomosis done single in double layer.

- *Feeding Jejunostomy:*

Distal feeding jejunostomy was done.

- *Closure:*

Following reconstruction, closed suction drains are placed near the pancreatic and biliary anastomoses to observe postoperative drainage. A nasogastric tube is kept to decompress the stomach. abdomen was closed in layers.

- *Postoperative Care:*

The patient was initially managed in the intensive care unit. On postoperative day 3, an anastomotic leak was identified, for which total parenteral nutrition (TPN) was initiated. Oral feeding was gradually resumed on postoperative day 14. The patient made a full recovery and was discharged on postoperative day 26. The follow-up period remained uneventful.

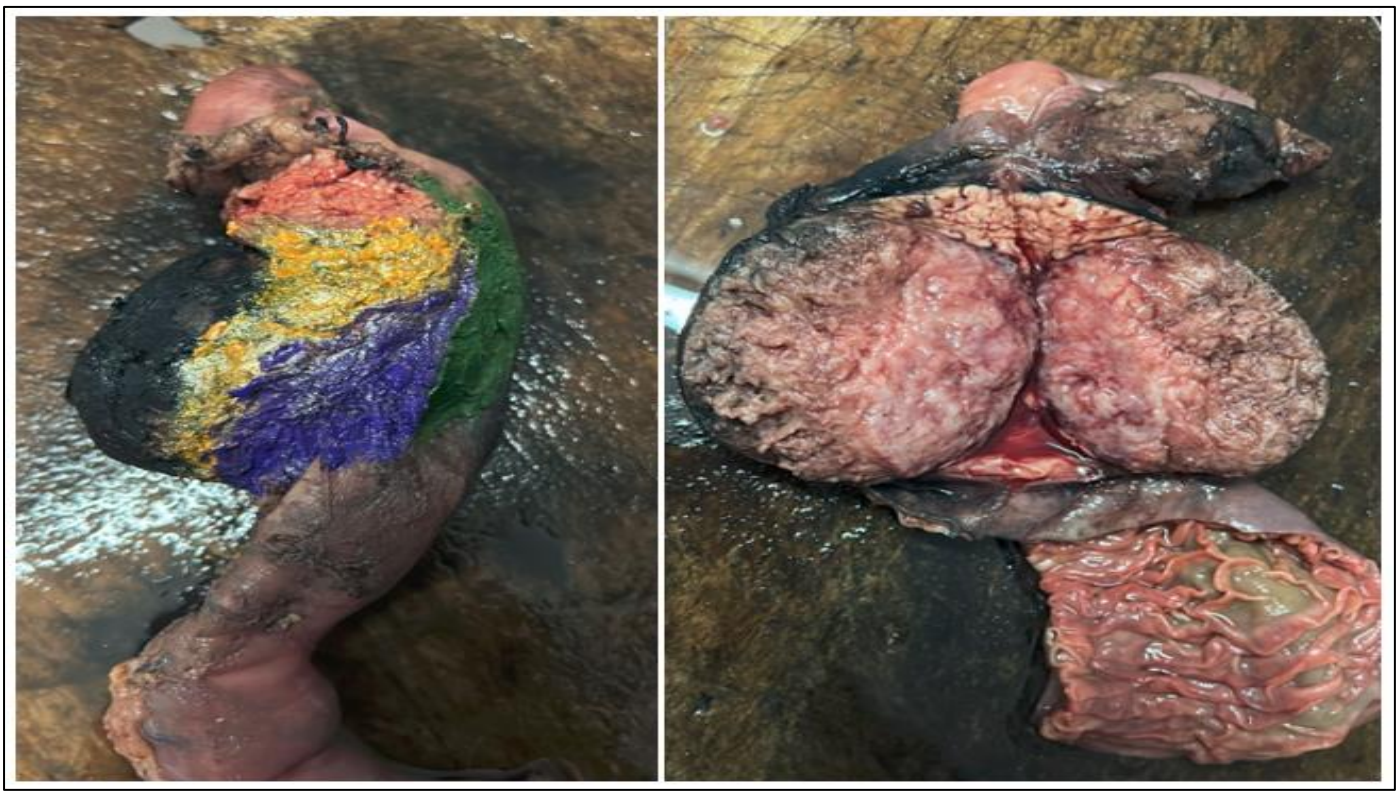

Fig 2 Specimen of Whipple Procedure

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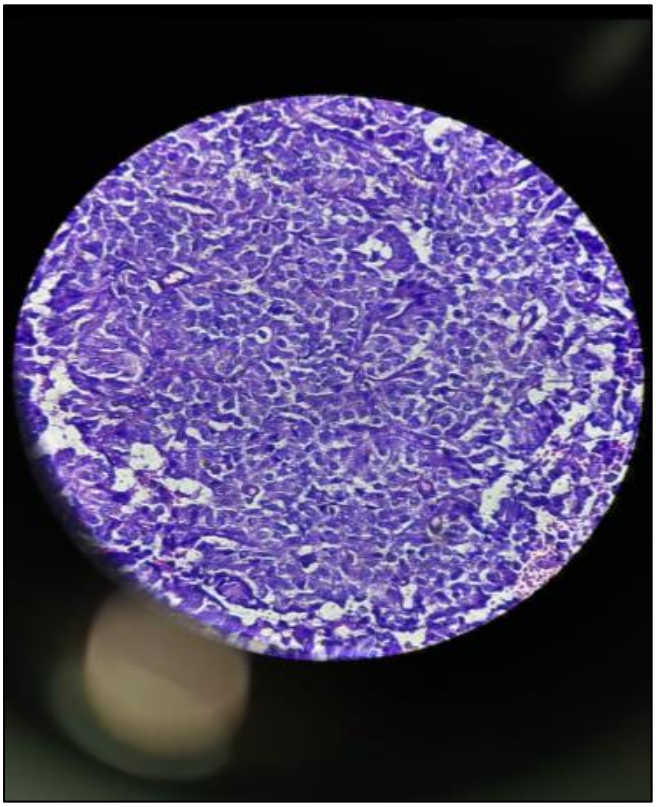

Fig 3 Histopathology Confirming Solid Pseudopapillary Neoplasm of Pancreas

IV. DISCUSSION

Solid pseudopapillary neoplasm (SPN) of the pancreas is an indolent and rare tumor that has a predominance among young women. Even though it has low malignant potential, surgical removal is still the mainstay of therapy owing to the risk of local invasion or exceptional metastasis. In this patient, the head position of the tumor prompted a pancreaticoduodenectomy (Whipple procedure), still the standard for total oncological resection in such a presentation.

The Whipple operation, though technically challenging and being burdened with a high rate of perioperative complications, has also seen improvements in safety in terms of advancements in the technique of operation, perioperative care, as well as in the selection of patients. Our patient had an otherwise complicated postoperative course featuring an anastomotic leak—one of the more significant postoperative complications following this procedure. Nonetheless, this was successfully managed with conservative care including total parenteral nutrition, and the patient eventually fully recovered without necessitating reoperation.

The success of this case reiterates the significance of early diagnosis, careful surgical technique, and careful postoperative monitoring in attaining favorable outcomes despite complications. The uneventful recovery of the patient and absence of recurrence during follow-up emphasize the good prognosis of SPNs when adequately treated with curative intent.

V. CONCLUSION

This case underscores the position of the Whipple procedure as a effective and potentially curative measure for solid pseudopapillary tumors of the head of the pancreas. With its complexity and risk of postoperative complications, prompt operative treatment coupled with proper supportive management may result in superb long-term outcomes. Early diagnosis, tailored operative planning, and interdisciplinary treatment continue to play pivotal roles in maximizing outcomes among individuals afflicted with this uncommon pancreatic malignancy.

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