Ann Surg Oncol (2023) 30:5758–5760
https://doi.org/10.1245/s10434-023-13782-z

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

ORIGINAL ARTICLE – PANCREATIC TUMORS

Pancreaticoduodenectomy in the Portal Annular Pancreas–Mesopancreas Triangle Approach (with Video)

Amir M. Parray, MS, DNB[1], Shravan Nadkarni, MS, FMAS, MCh[2], Vikram Chaudhari, MS, DNB[3,4], Shailesh V. Shrikhande, MS, MD, FRCS (Hon), FASA (Hon)[3,4], and Manish S. Bhandare, MS, MCh[3,4]

[1]BLK Max Super Specialty Hospital, New Delhi, India; [2]Karnataka Cancer Therapy and Research Institute, Hubballi, Karnataka, India; [3]Gastrointestinal and Hepato-Pancreato-Biliary Service, Department of Surgical Oncology, Tata Memorial Hospital, Homi Bhabha National Institute, Mumbai, Maharashtra, India; [4]Homi Bhabha National Institute, Mumbai, India

ABSTRACT

Background. Portal Annular Pancreas (PAP) is a relatively uncommon entity with 4% reported incidence. Pancreaticoduodenectomy is challenging in cases with PAP and is associated with higher postoperative pancreatic fistula rate and overall morbidity. PAP is classified according to the pattern and location of fusion around the portal vein as—supra-splenic, infra-splenic & mixed fusion type. Also, the ductal anatomy can vary as pancreatic duct present only in the ante-portal portion or only in the retro-portal portion or ducts in both ante and retro-portal portion. At present, ideal surgical strategy is not defined as per the PAP types.

Methods. The case demonstrated in the video presented with a localized, large duodenal mass with type IIA PAP (supra-splenic fusion with both ante and retro-portal ducts) detected on the preoperative triphasic CT scan. To achieve a single pancreatic cut surface with a single pancreatic duct for anastomosis, an extended pancreatic resection was performed using meso-pancreas triangle approach.

Results. Patient had a smooth intraoperative course & the postoperative recovery was also uneventful. Pathology reported pT3 duodenal cancer with negative margins and uninvolved lymph nodes.

Conclusion. A preoperative knowledge of PAP and its various types is extremely important in order to tailor intraoperative management, specially of the retro-portal portion. In patients with retro-portal duct or both ante and retro-portal ducts (as the case presented in the video), an extended resection is recommended to mitigate postoperative pancreatic fistula.

Keywords Portal annular pancreas · Annular pancreas · Circumportal pancreas

THE PROBLEM

1. Preoperative recognition of portal annular pancreas and the corresponding modulation of pancreatic resection are essential to mitigate the risks associated with improperly managed retro-portal pancreas.
2. The incidence of clinically relevant fistula is 71 % when the standard line of transection is used after pancreaticoduodenectomy. However, this incidence decreases to 16 % when an extended resection is performed to obtain a single pancreatic stump.
3. This report describes a mesopancreas-triangle approach for a patient with a main duct intrapapillary mucinous neoplasm of the pancreatic head and type 2A portal annular pancreas.
4. The pancreatic transection and division of the annular part should be the final steps of the surgery to decrease blood loss during the procedure, optimize lymphadenectomy, and achieve an appropriate transection line.

First Received: 18 April 2023
Accepted: 12 June 2023
Published online: 4 July 2023

M. S. Bhandare, MS, MCh
e-mail: manishbhandare@gmail.com

INTRODUCTION

Preoperative recognition of the portal annular pancreas and modulation of the pancreatic resection is essential to mitigate risk associated with improperly managed a retro-portal pancreas. The incidence of clinically relevant fistula after pancreaticoduodenectomy decreased to 16 % from 71 % when extended resection was used to obtain a single pancreatic stump.[1–5] Although the risk is real and the extended resection may have a significant impact on the final operative outcome, the appropriate surgical strategy in this scenario is yet to be described.

CASE DETAILS

This report describes the mesopancreas-triangle approach for a patient with main duct intrapapillary mucinous neoplasm of the pancreatic head and type 2A portal annular pancreas (Fig. 1, Video 1).

SURGICAL TECHNIQUE

After extended kocherization, periportal lymphadenectomy is performed along the common hepatic artery, continuing toward the celiac trunk, and the peripancreatic head plexus is disconnected. Subsequently, the infra-pancreatic superior mesenteric vein (SMV) is identified, followed by identification of the superior mesenteric artery (SMA) at the level of the proximal dorsal jejunal vein. Dissection along the SMA is then completed using an uncinate first approach until its origin from the aorta. This specific approach ensures disconnection of the pancreatic head from the mesopancreas-triangle area before the annular region is addressed (Video 1).

The pancreatic transection is directed toward the left, targeting the splenic vein. Finally, the specimen containing the supra-splenic annular pancreas is suspended on the portal vein, which is dissected meticulously as the final step of the operation (Video 2).

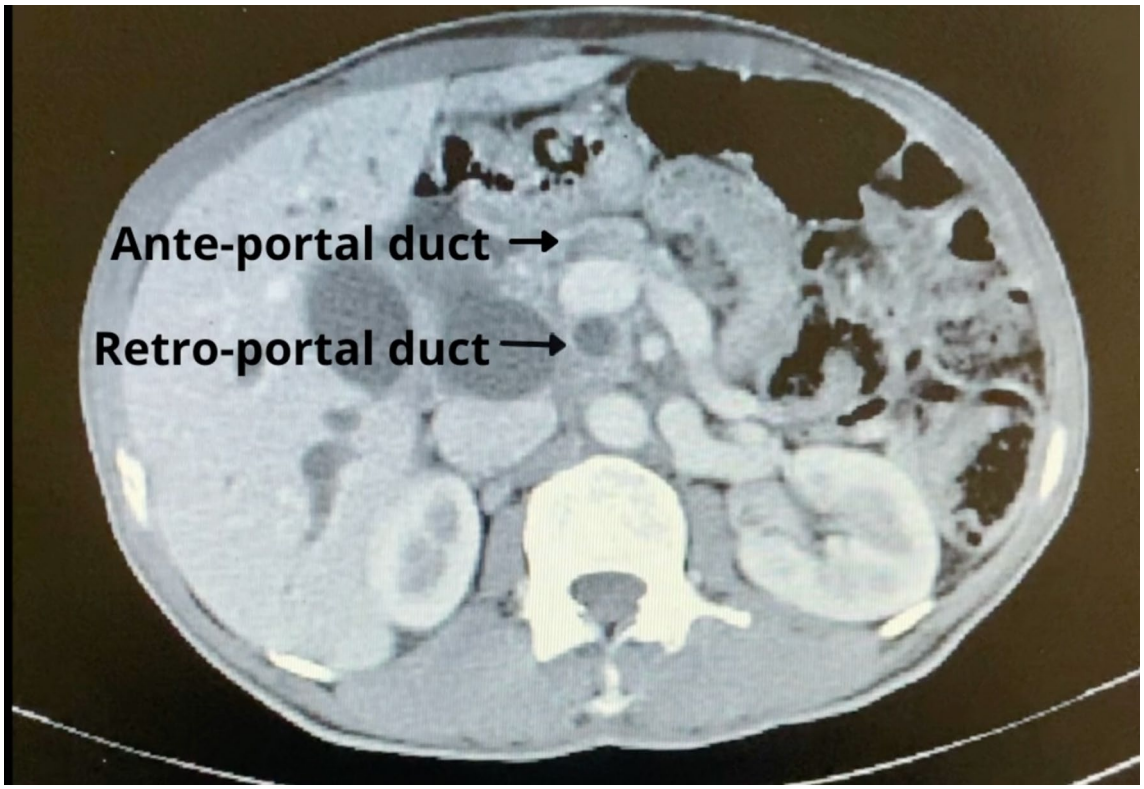

FIG. 1 Intrapapillary mucinous neoplasm (IPMN) of the pancreatic head with a type 2A portal annular pancreas

CONCLUSION

This stepwise approach allows enhanced control during dissection, reduced complications, and optimized lymphadenectomy.

SUPPLEMENTARY INFORMATION The online version contains supplementary material available at https://doi.org/10.1245/s10434-023-13782-z.

DISCLOSURE The authors declare no conflicts of interest.

REFERENCES

1. Ishigami K, Tajima T, Nishie A, et al. The prevalence of circumportal pancreas as shown by multidetector-row computed tomography. *Insights Imag*. 2011;2:409–14.
2. Karasaki H, Mizukami Y, Ishizaki A, et al. Portal annular pancreas, a notable pancreatic malformation: frequency, morphology, and implications for pancreatic surgery. *Surgery*. 2009;146:515–8.
3. John R, Simon B, Eapen A, et al. Portal Annular pancreas: an underrecognized variant, prevalence, and clinical relevance. *Trop Gastroenterol*. 2020;40:132–6.
4. Joseph P, Raju RS, Vyas FL, Eapen A, Sitaram V. Portal annular pancreas: a rare variant and a new classification. *JOP J Pancreas*. 2010;11:453–5.
5. Pandrowala S, Parray A, Chaudhari V, et al. Portal annular pancreas (PAP): an underestimated devil in pancreatic surgery: systematic review of literature and case report. *J Gastrointest Surg*. 2021;25:1332–9.