



## Robotic pancreaticoduodenectomy after unsuspected double perforation (bile duct and portal vein) during endoscopic biliary stent placement – Video article

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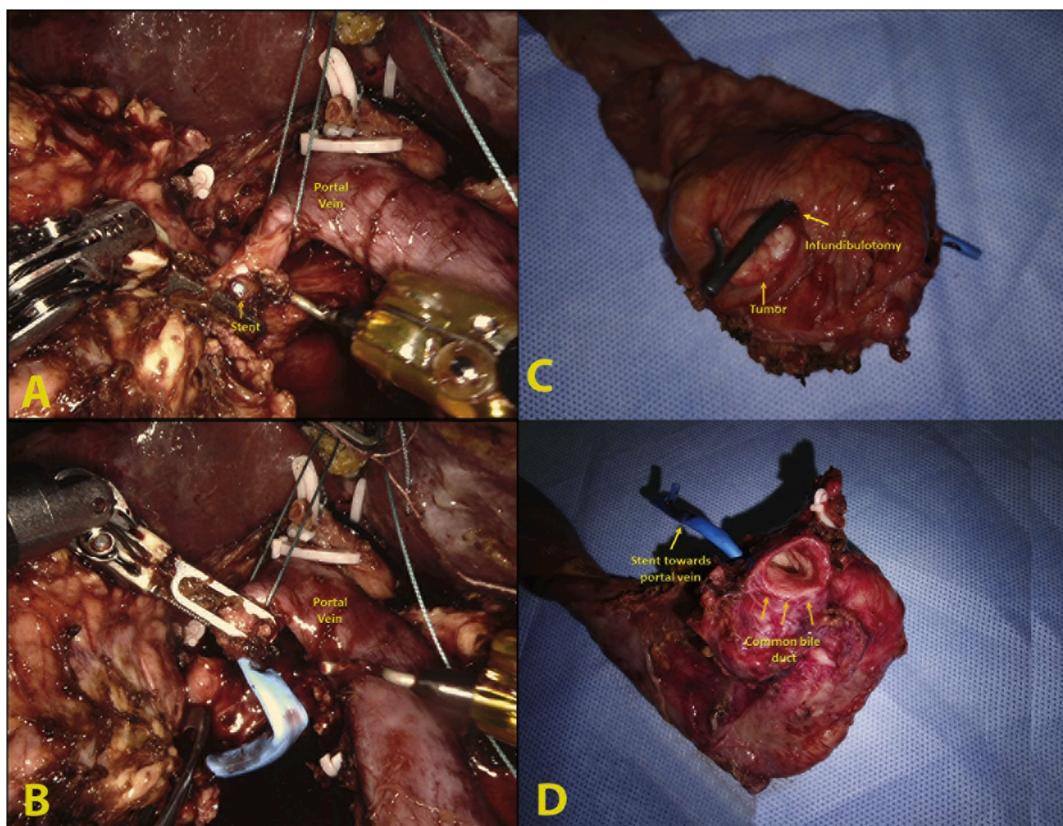
Complication

Endoscopic placement of biliary stent is a common procedure used in malignant jaundice patients. However, sometimes the cannulation of the bile duct fails, and an alternative is to perform a choledochoduodenal fistula (infundibulotomy) to access the biliary tract and place a biliary stent. Complications secondary to this procedure can occur and are relatively common. Unusual complications such as stent migration, perforation into vascular structures are rare [1]–[3]. Wrong positioning of the stent can be avoided if cholangiography shows opacification of the portal vein or hepatic artery [1]. We present a robotic pancreaticoduodenectomy performed after a complicated endoscopic retrograde cholangiopancreatography (ERCP) that required emergency laparotomy for drainage. The initial diagnosis was duodenal perforation. During the definitive operation, an unsuspected double perforation (bile duct and portal vein) was found and successfully treated. We present in this video the case of a 57-year-old woman presented with progressive jaundice. ERCP disclosed a 2-cm tumor in the ampulla but cannulation of the biliary duct through the papilla failed. A choledochoduodenal fistula (infundibulotomy) was performed. A plastic endoprosthesis was inserted. Immediate after this procedure, patient developed diffuse peritonitis, leading to emergency laparotomy. Duodenal perforation was suspected but perforation site was not identified. Drain was placed. Drainage ceased after 3 weeks, drain was removed, and patient was transferred to our care. Multidisciplinary team decided for upfront pancreaticoduodenectomy. Robotic approach was proposed, and consent was obtained. Da Vinci Xi robotic system was

used. Operation begins with division of adhesions from previous operation. The Kocher maneuver is performed and the ligament of Treitz is mobilized. The proximal jejunum is passed behind the mesenteric vessels and divided with stapler. The duodenum is divided with stapler 2 cm below the pylorus. The gastroduodenal artery is dissected, ligated and divided between hemolocks. The common bile duct is divided with robotic scissors; however, the biliary stent is not found in the common bile duct. We suspected that it has migrated distally. Pancreas is divided with harmonic shears until identification of the pancreatic duct which is divided with scissors. Pancreatic head and uncinate process are carefully dissected from the portal vein and from the superior mesenteric artery. When the surgical specimen was only attached by a large branch from portal vein, this branch was dissected for hemolock insertion. However, hemolock insertion failed due to tissue resistance. We then realize that the missing biliary stent was, in fact, inside this portal branch and extended into the main portal vein. This branch is encircled and opened with identification of the biliary stent. Portal vein branch was clamped for safe removal of the biliary stent with minimum loss of blood (Fig. 1). Reconstruction of the alimentary tract was then performed as usual. Surgical specimen is removed through extension of auxiliary port incision. Abdominal cavity is drained, and procedure is completed. Total operative time was 6 hours and 38 minutes. Estimated blood loss was 320 mL, with no need of transfusion. Recovery was uneventful and patient was discharged on the 7th postoperative day. Pathology confirmed ampulla of Vater adenocarcinoma T2N0M0. Patient is well with no signs

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**Fig. 1.** Robotic pancreaticoduodenectomy after unsuspected double perforation (bile duct and portal vein) during endoscopic biliary stent placement.  
**A.** Intraoperative photograph. Biliary stent is inside the portal vein branch.  
**B.** Intraoperative photograph. Biliary stent is being removed from the portal vein.  
**C.** Surgical specimen. Infundibulotomy was performed above the tumor and stent was inserted towards the portal vein.  
**D.** Surgical specimen. Biliary stent can be seen perforating the lateral wall of the dilated common bile duct towards the portal vein.

of disease, 4 months after operation. In conclusion, robotic pancreaticoduodenectomy is safe and feasible even after ERCP complications that required laparotomy. Absence of endoprosthesis in the common bile duct may arise suspicion of wrongfull insertion towards adjacent organs and must be dealt with caution.

#### Disclosure

Drs. Machado, Surjan, Makdissi and Ardengh have no conflicts of interest or financial ties to disclose.

#### Authorship statement

All authors have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval

of the version to be submitted.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.suronc.2020.04.027>.

#### References

- [1] E. Ricci, M.G. Mortilla, R. Conigliaro, G. Bertoni, G. Bedogni, F. Chilovi, Portal vein filling: a rare complication associated with ERCP for endoscopic biliary stent placement, *Gastrointest. Endosc.* 38 (4) (1992) 524–525.
- [2] H. Inoue, S. Tano, R. Takayama, K. Nimomiya, K. Nishikawa, M. Katurahara, N. Horiki, Y. Takei, Right hepatic artery pseudoaneurysm: rare complication of plastic biliary stent insertion, *Endoscopy* 43 (Suppl 2) (2011). UCTN:E396.
- [3] T.O. Lankisch, T.A. Alten, F. Lehner, W. Knitsch, Biliary stent migration with colonic perforation: a very rare complication and the lesson that should be learned from it, *Gastrointest. Endosc.* 74 (4) (2011) 924–925.