



# Robotic Isolated Pancreaticojejunostomy After Pancreatoduodenectomy: A Good Choice for Young Patients with Expected Long-Term Survival

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Pancreatoduodenectomy (PD) is the procedure of choice for resectable tumors located in the head of the pancreas. Until recently, this procedure was associated with high mortality and morbidity.<sup>1</sup> The complications after pancreatoduodenectomy mainly concern postoperative pancreatic fistula (POPF), which is the main cause of morbidity and mortality. Among the various techniques to reduce the incidence of clinically relevant POPF, the use of an isolated jejunal loop for pancreatojejunostomy was introduced by Machado in 1976.<sup>2</sup>

The use of an isolated jejunal loop for pancreatojejunostomy has been the subject of several publications.<sup>3–6</sup> Recently, it has been shown that this type of reconstruction does not reduce the incidence of pancreatic fistula, but does reduce the severity of this complication.<sup>4</sup> A recent propensity score study also showed that an isolated jejunal loop for pancreatojejunostomy in soft pancreas and small pancreatic duct reduces the severity of pancreatic fistulas.<sup>5</sup> The incidence of clinically relevant POPF was higher (41% vs. 27%;  $p = 0.023$ ) in patients who received a single-loop reconstruction when compared with an isolated loop reconstruction.<sup>5</sup> Postoperative hospital stay was also significantly shorter in the isolated pancreaticojejunostomy group.<sup>5</sup> In a prospective randomized study, the incidence of POPF was similar in the isolated pancreaticojejunostomy (15.7%, 17/107) and conventional reconstruction (17.6%, 19/109) groups. The incidence of type B POPF was higher in the conventional than

in the isolated pancreaticojejunostomy group. Furthermore, patients with POPF in the conventional group had a significantly longer postoperative hospital stay ( $31.9 \pm 6.9$  days) and higher total hospital costs than patients in the isolated pancreaticojejunostomy group ( $p < 0.05$ ).<sup>6</sup>

This technique is also indicated in very young patients with low-grade malignant disease, as a single jejunal loop causes reflux of pancreatic juice into the bile duct. In patients with expected long-term survival, this reflux could lead to malignant degeneration of the biliary epithelium.<sup>7,8</sup> This late complication may affect young patients with low-grade or benign disease with a life expectancy of more than 20 years. These diagnoses are becoming more common, such as solid pseudopapillary neoplasms, neuroendocrine tumors, and intraductal papillary mucinous neoplasms (IPMN), and the number of pancreatoduodenectomies performed for these indications is increasing.<sup>9</sup>

Minimally invasive pancreatoduodenectomy (PD) is one of the most complex procedures in oncologic surgery. Isolated pancreatojejunostomy reconstruction after PD has been used by our service since the first publication for open PD.<sup>3</sup> We have also been performing this technique for laparoscopic procedures since 2012.<sup>10</sup> However, there are no reports on the use of this technique in robotic-assisted procedures.

We present a video of an 18-year-old woman with a 6 cm solid pseudopapillary neoplasm in the head of the pancreas (Fig. 1). Magnetic resonance imaging (MRI) showed no dilatation of the bile duct or pancreatic duct. The multidisciplinary team opted for a pylorus-preserving pancreatoduodenectomy. Given the young age of the patient and the high risk of pancreatic fistula, we opted for an isolated pancreatojejunostomy (Fig. 2). We proposed a robotic approach and obtained consent.

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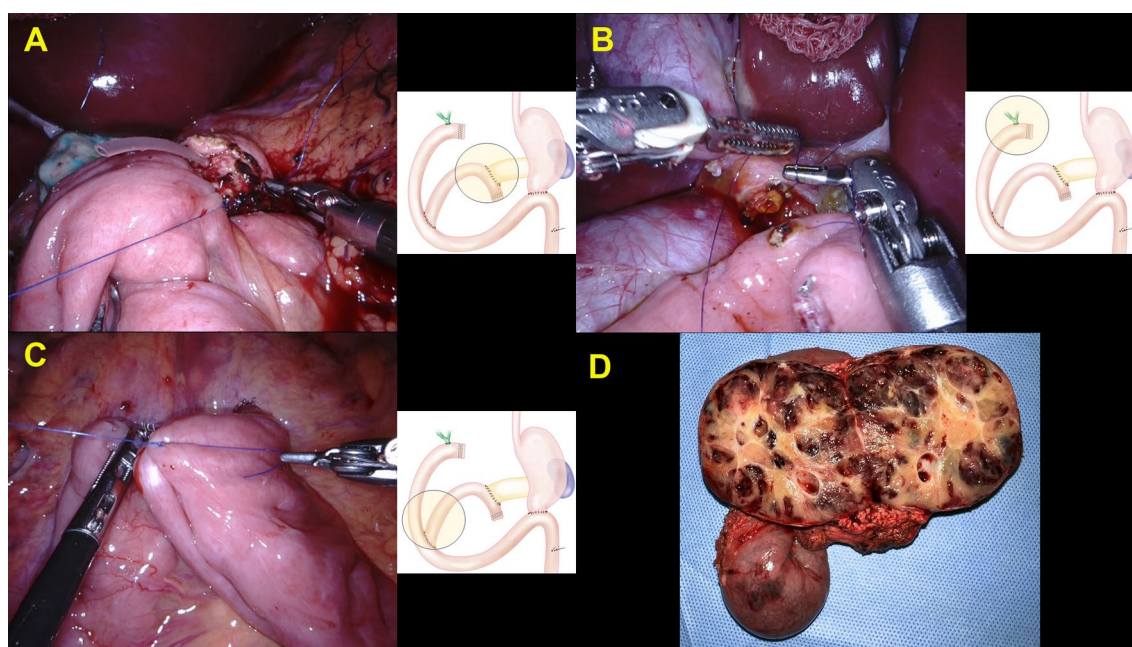
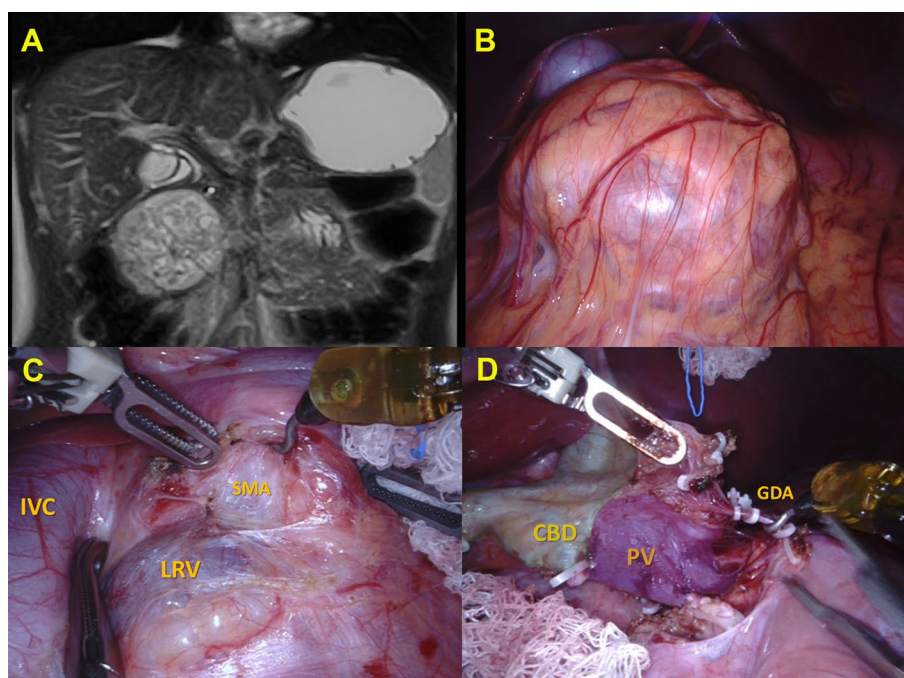
First Received: 9 December 2024

Accepted: 4 February 2025

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Published online: 06 March 2025

**FIG. 1** Robotic pancreatoduodenectomy; **A** the preoperative MR image in coronal view shows a large tumor in the pancreatic head, while the pancreatic and bile ducts are not dilated; **B** the intraoperative view shows a large tumor occupying the head of the pancreas; **C** the intraoperative view shows the artery first approach; *IVC* inferior vena cava, *LRV* left renal vein, *SMA* superior mesenteric artery; **D** the intraoperative view shows a hilar dissection; *PV* portal vein, *CBD* common bile duct, *GDA* gastroduodenal artery



**FIG. 2** Robotic isolated pancreaticojejunostomy after pancreatoduodenectomy; **A** intraoperative view after resection: an isolated jejunal loop is brought to the supramesocolic space and sutured to the pancreatic stump; **B** intraoperative view of the hepatojejunostomy with

double jejunal loop reconstruction; **C** intraoperative view of the jejuno-jejunostomy to create an isolated loop for the pancreaticojejunostomy; **D** the surgical specimen shows a large solid pseudopapillary neoplasm

The total operating time was 320 min with an estimated blood loss of 140 ml. Resection time was 156 min (versus  $200 \pm 62$  min, average team time<sup>11</sup>) and reconstruction was 143 min (versus  $112 \pm 13$  min, average team time<sup>11</sup>). Recovery was uneventful, despite a grade A pancreatic fistula

(biochemical leak), which was treated with late removal of the drain. The patient was discharged on postoperative day 7. The patient's pathology confirmed a solid pseudopapillary neoplasm measuring 6.3 cm with free margins, stage T3N0 (0/28).

Isolated pancreatojejunostomy after PD can reduce the severity of pancreatic fistula and may be a good option for young patients with benign or low-grade neoplasms, and patients with soft pancreas and high risk of clinically relevant POPF. It may increase the surgical reconstruction time, but not the overall time, as the resection phase is usually easier in those cases. This procedure can be safely performed with the robotic platform. This video can help oncologic surgeons perform this complex procedure.

**SUPPLEMENTARY INFORMATION** The online version contains supplementary material available at <https://doi.org/10.1245/s10434-025-17037-x>.

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