



## Case Report

# Total Pancreatectomy with Spleen Preservation for Degenerated IPMN: A Hybrid Fusion between the Kimura Technique and the Whipple Procedure

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### Aims

Surgical treatment of pancreatic lesions could be challenging because the site in the gland strongly conditions the choice of the surgical approach.

In this video, we present our experience and technique to perform a total pancreatectomy merging two different procedures (Kimura and Whipple) in a patient with diagnosis of Intraductal Papillary Mucinous Neoplasm (IPMN) with worrisome features.

**Keywords:** Pancreatectomy; IPMN; Pancreatic cancer; Whipple; Kimura; Pancreatic surgery

### Methods

This is a case of a 72-years-old man complaining of headache and jaundice. An abdomen CT scan was performed, revealing a pancreatic atrophy, Wirsung ectasia and a 7 mm body-tail lesion. An abdominal MRI showed cystic lesions all along the pancreatic parenchyma with Wirsung enlargement (12 mm). The lesion of the pancreatic head appeared with radiological worrisome features. Through an endoscopic ultrasound, a biopsy was made, revealing an IPMN with pathological worrisome features. Carcino-Embryonic Antigen (CEA) and Carbohydrate Antigen 19-9 (CA 19-9) were respectively 6 ng/mL and 80 U/mL.

After multidisciplinary team consultation and literature revision [1, 2], due to high risk of malignant evolution, patient

was scheduled for a total pancreatectomy. In consideration of the absence of a preoperative malignant diagnosis, we decided to preserve the spleen, following the Kimura approach<sup>3</sup>, i.e., through a selective ligation of the pancreatic vessels arising from the splenic vessels.

The rationale for this hybrid surgical strategy arises from the fact that it is a precancerous disease, without clinical radiological signs of full-blown cancer, with the largest mucinous cystic lesion localized to the pancreatic head. As regards the preservation of the spleen according to the Kimura technique, the choice arises from a lack of worrisome features affecting the minor lesions of the body and tail of the pancreas.

Preserving the spleen reduce the risk of postoperative infection from capsulated bacteria; in addition, the platelets turnover acted by the spleen avoids the excessive thrombocitemia, which can lead to thrombotic events.

The patient was placed supine and a xipho-infraumbilical laparotomy was made. Our dissection started with an extensive Cattell-Braasch maneuver with optimal caval plane exposure, followed by the lymphadenectomy of station 16. A cholecystectomy was made in order to gain the access to the *porta hepatis*, i.e., to the hepatic hilum. Then we performed a lymphadenectomy of stations 12a, 8 and 9. The following vascular dissection allowed the isolation of the common hepatic artery, the gastroduodenal artery, the splenic artery, and the splenic vein. A fundamental step in our procedure is represented by the dissection of the trunk of Henle, in proximity of pancreatic isthmus, which stands as a landmark of this technique. Although the anatomic variability of this structure is high, we encountered the most common type, as for it was made by right gastroepiploic vein, middle colic vein and anterior superior pancreaticoduodenal vein [4]. We choosed the Kimura approach to isolate the body-tail parenchyma from the splenic vessels. This technique starts with a vascular phase which is conducted from right to the left not only due to oncological reasons, but to technical aspects too; in fact, we firstly approached the little pancreatic veins draining in the splenic vein, because they are frailer than arteries [5]. The damage of the splenic vein would contraindicate the completion of the Kimura technique. We did not encounter problems with splenic congestion, because the main splenic vein ensures the correct blood drainage. Subsequently, all the little pancreatic arteries originating from the splenic artery were ligated and sectioned.

In the parenchymal phase, we proceeded from left to the right in order to regain the correct retroperitoneal plane, reaching the pancreatic isthmus on the left lateral margins of the spleno-mesenteric trunk. That differs from the classical Whipple procedure; because of course here, we had any pancreatic section.

After the pancreas was completely isolated from the splenic vessels, we completed the surgery with the Whipple procedure. After the sectioning of the biliary duct, we sent the margins to extemporary examination (negative for cancer), and we collected a bile sample for microbiological tests [6].

The stomach was then prepared, and a distal gastric section was made. After the distal jejunal section, we proceeded with the twisting of the ligament of Treitz. Finally, we released the pancreatic head from the last adhesions to the mesenteric vessels. After the specimen was removed, we could have a complete overview on the vascular anatomy, in particular on the splenic vessels and on the spleen that we have correctly preserved.

For we performed a total pancreatectomy, we did not have to fashion any pancreaticojejunostomy. Due to oncological reasons, we performed a total pancreatectomy, but a good alternative, in absence of IPMN of the body and the tail, could have been a chemical pancreatectomy [7, 8].

The reconstructive phase started with the biliojejunostomy that we performed in double layer with single stitches in Polydioxanone (PDS) 4-0 and 5-0. After the check of biliostasis was made, we proceeded with the fashioning of gastro-jejunal anastomosis. In this case, we opted for a Roux-en-Y reconstruction, to prevent possible complications deriving from the gastrectomy [9]. We usually finish our pancreatectomies with the fashioning of a nutritional jejunostomy, so that we can early re-feed our patients in the immediate postoperative period, reducing the morbidity caused by massive total parenteral nutrition. In our experience an early enteral refeeding increase also the biosynthesis enzymes level, reducing indirectly postoperative fistulas<sup>10</sup>. Two drains were placed: one in the biliojejunostomy area, another in splenic space.

## Results

The postoperative course was uneventful, and the patient was discharged on postoperative day 15, after correct refeeding and normal glucose blood values were achieved, the drains removed and blood tests fully normalized. We performed a contrast-enhanced abdomen CT scan before discharge that showed no major complications and good preservation of the spleen.

The pathological examination revealed a high-grade ductal adenocarcinoma of the pancreatic head (WHO 2019) originated from an IPMN with intestinal phenotype (CDX2+, EMA+, CK7+, MUC5AC-/+ , MUC6-, CK20-). The final stage was pT1bN0 G2 with 0 pathological lymph nodes from the 21 collected. The surgical resection margins were unaffected.

3- and 6-months follow-up were both negative and the patient is currently under oncological supervision.

## Conclusions

Surgical treatment of IPMN with worrisome features must always be considered, due to the high risk of malignant evolution. For lesions affecting head, body and tail of pancreas, a total pancreatectomy merging Kimura and Whipple approaches, although challenging, could be recommended to preserve the spleen. Multidisciplinary approach and high surgical experience settle as pivotal features for a correct management of these patients.

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