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HOW-I-DO-IT ARTICLE

Central pancreatectomy with inframesocolic pancreatojejunostomy

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Abstract
Purpose Pancreatic fistula (PF) occurs frequently after central pancreatectomy (CP), but it is not clear from which pancreatic stump it arises and, consequently, which interventions can reduce its incidence and severity. The information could be obtained if the two pancreatic remnants were segregated into different body compartments.
Methods In eight consecutive patients, the cut end of the distal pancreatic stump after CP was brought in the inframesocolic compartment through a small defect created in the transverse mesocolon. Pancreatojejunostomy was hence constructed in the intraperitoneal compartment, being divided by the retroperitoneal right-sided pancreatic stump by the transverse mesocolon itself. Five patients were operated on open, and three by robot-assisted laparoscopy. PF was defined according to the criteria proposed by the International Study Group on Pancreatic Fistula.
Results PF fistula developed in five out eight patients (three grade A and two grade B). Amylase concentration in the fluid obtained from surgical drains showed that the two pancreatic remnants were actually segregated into different body compartments and that four out of five PF originated from the right remnant. Mean hospital stay was 12.5 days. No patient was readmitted, developed peripancreatic fluid collections, required interventional radiology procedures, or underwent repeat surgery.
Conclusions In CP, interposing an anatomic barrier, such as the transverse mesocolon, between the two pancreatic remnants is a simple maneuver that, if on one hand, adds little to the complexity of the operation, on the other, provides insights into the origin of PF after CP.

Keywords Central pancreatectomy · Pancreaticojejunostomy · Pancreatic fistula · Robot-assisted laparoscopy

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Introduction

Central pancreatectomy (CP) is a conservative operation suitable for the treatment of benign, or low-grade, tumors arising in the neck or proximal body of the pancreas that cannot be safely enucleated [1, 2]. In these highly selected patients, segmental pancreatic resection preserves a large amount of healthy pancreas, the spleen, and the anatomy of upper gastrointestinal and biliary tracts. In the long-term, CP reduces the risk of endocrine insufficiency [1–3], preserves exocrine reserve [2, 4], and avoids post-splenectomy

complications [1]. CP may also result in better digestive function, nutritional status [4, 5], and quality of life [1].

These long-term benefits, however, may be outweighed by the greater early morbidity associated with CP, as compared with distal pancreatectomy, that is mostly caused by the high incidence of pancreatic fistula (PF) [6]. Although the risk of PF does not seem to be strictly additive, there are a number of risk factors that make the incidence of PF higher in CP than in single-sided pancreatic resections. In the first place, there are two pancreatic remnants [1, 2]. Secondly, the proximal transection line falls much more to the right than in conventional distal pancreatectomy, usually at the right side of the portal/superior mesenteric vein, close to the gastroduodenal artery, where the transected parenchyma is thicker and may include both Wirsung's and Santorini's ducts [7]. Third, since CP is indicated only for benign or low-grade pancreatic tumors, the pancreatic parenchyma in the distal stump is typically soft, and the main pancreatic duct is small [1, 2]. Soft pancreas and a small pancreatic duct have both been suggested to increase the risk of PF [8].

Development and validation of new surgical techniques for CP is, at least in part, hampered by lack of reliable information on the site of origin of PF. The information could be obtained if the two pancreatic remnants were segregated into different body compartments. To do so, we have decided to dislodge the cut end of the distal pancreatic stump, and hence the pancreaticojejunostomy, in the infra-mesocolic intraperitoneal space through a small window created in the transverse mesocolon. We herein describe the details of this modified technique and report its results with special reference to its capacity to actually segregate the pancreatic remnants into two different body compartments.

Materials and methods

Between 1 October 2008 and 1 September 2011, eight consecutive patients (three males, five females; mean age, 45.2 years; range, 27–63 years) underwent CP at our institution. Candidates were selected among a total of 284 patients undergoing pancreatic resection during the same period of time (8/284; 2.8%). Each of the patients selected for CP had a preoperative diagnosis of a small, presumably benign, pancreatic tumor located in the neck or proximal body of the pancreas for which enucleation was not recommended. Diagnostic work-up included multidetector contrast-enhanced computed tomography and magnetic resonance cholangiopancreatography in all patients. Endoscopic ultrasonography was also employed as needed, and intraoperative ultrasonography was carried out in each patient to confirm preoperative information.

All but one patient, with clinical signs and symptoms of insulinoma, had an incidental diagnosis. Frozen section histology, of tumor itself and both resection margins, was obtained during surgery to confirm preoperative diagnosis and before deciding how to complete the operation.

Incidence and severity of PF were defined and scored according to the recommendations of the International Study Group on Pancreatic Fistula [9].

Surgical technique

In five patients, CP was carried out through a midline incision. In three patients, the same operation was carried out laparoscopically with the assistance of the da Vinci's surgical system (Intuitive Surgical®, Sunnyvale, CA, USA). In these patients, five ports were used, and the specimen, preloaded into a plastic bag, was extracted through an enlarged trocar site. In every patient, the same surgical technique was adopted, irrespective of the surgical approach.

In all patients, the lesser sac was entered by dividing the gastrocolic ligament while preserving the gastroepiploic vessels. The anterior surface of the pancreas was exposed and final tumor resectability assessed. The central portion of the pancreas was then dissected free from its posterior attachments by individually securing and dividing the small branches of the splenic vessels. Segmental pancreatic resection was carried out by leaving at least 1 cm of uninvolved parenchyma at both resection margins. The pancreas was divided using electrocautery and main bleeding sites controlled with transfixion sutures of 5-0 polypropylene. The main pancreatic duct was identified at both resection margins. On the right side, it was selectively ligated and the pancreatic parenchyma oversewn with interrupted nonabsorbable 3-0 sutures. Before extracting the specimen, the distal pancreatic margin was tagged with a stitch for proper pathology orientation. The result of frozen section histology was awaited to decide how to complete the operation. Since favorable tumor type and clear margins were always confirmed, CP was completed in each patient. In order to create a barrier between the two pancreatic remnants, the distal stump was fit into a small incision created in the overlaying avascular portion of the transverse mesocolon. To do so, the pancreatic body did not need to be mobilized more than it is usually required for easy pancreatojejunostomy (i.e., for approximately 1 to 1.5 cm). Before proceeding with the anastomosis, the pancreatic stump was circumferentially secured to the mesocolic breach by a running suture of 3-0 absorbable material.

According to our institutional policy, an end-to-side invaginating pancreaticojejunostomy was constructed in a double layer of interrupted nonabsorbable sutures. The outer layer incorporated the capsule and the parenchyma of the pancreas and the seromuscular layer of the jejunum. The

inner layer incorporated the capsule and a portion of the parenchyma of the pancreas and the full thickness of the jejunum. The procedure was completed by end-to-side jejunojejunostomy. Before abdominal closure, or release of pneumoperitoneum, two 12-Fr closed suction Redon's drains were placed around each pancreatic stump (Figs. 1 and 2).

During hospital stay, amylase and lipase concentrations were assayed daily in the fluid obtained from surgical drains. Such information were used to identify patients with PF. Further, comparison of amylase and lipase concentration between "right-sided" and "left-sided" drains was used to verify if dislodgement of the cut end of the distal pancreatic stump in the inframesocolic intraperitoneal space resulted in actual segregation of the two pancreatic stumps in "watertight" compartments. Before hospital discharge, patients were checked by abdominal ultrasound to verify that no significant peripancreatic fluid had been missed by result of drain displacement or malfunction.

Results

Inframesocolic intraperitoneal pancreatojejunostomy was easily constructed in all patients. No intraoperative complication occurred, and no patient received blood transfusions either intra- or postoperatively. Open CP was completed in a mean of 303.0 min (range, 275–355 min). Laparoscopic robot-assisted CP was competed in a mean of 426.7 min (range, 390–450 min), including the time to drape and dock the robot (approximately 25–35 min per patient) but excluding general room setup time.

There was no postoperative mortality, but five patients developed postoperative complications (5/8; 62.5%). Each of these patients developed a PF. According to the recommendations of the International Study Group on Pancreatic Fistula [9], there were three grade A and two grade B PF. Grade B PF were managed by delayed removal of surgical drains plus injection of somatostatin analogues, without additional interventions. No patient required reoperation and/or interventional radiology procedures.

As shown in Table 1, concentration of pancreatic enzymes in "right" and "left" drains was clearly discordant demonstrating that the two pancreatic remnants were actually confined in different watertight body compartments. Accordingly, no patient developed simultaneous PF from both pancreatic stumps, and four out of five PF originated from the right-sided pancreatic remnant. The patient having a PF fistula originating from the pancreatojejunostomy was operated through an open approach. She developed a grade B PF, but she neither became symptomatic nor developed leukocytosis. Namely, she had no abdominal complaints, potentially indicating peritoneal inflammation caused by uncontrolled dripping of pancreatic juice.

Patients were discharged from the hospital after a mean period of 12.5 days (range, 7–26 days). No patient was readmitted for percutaneous catheter drainage or other interventional procedures, and all are alive and well after a mean follow-up period of 22.2 months (range, 2–37 months).

As shown by follow-up magnetic resonance imaging and computed tomography scan (Fig. 3), construction of the inframesocolic intraperitoneal anastomosis widely spaces out pancreatic stumps. The distal stump, in particular, comes to lie in a near vertical position.

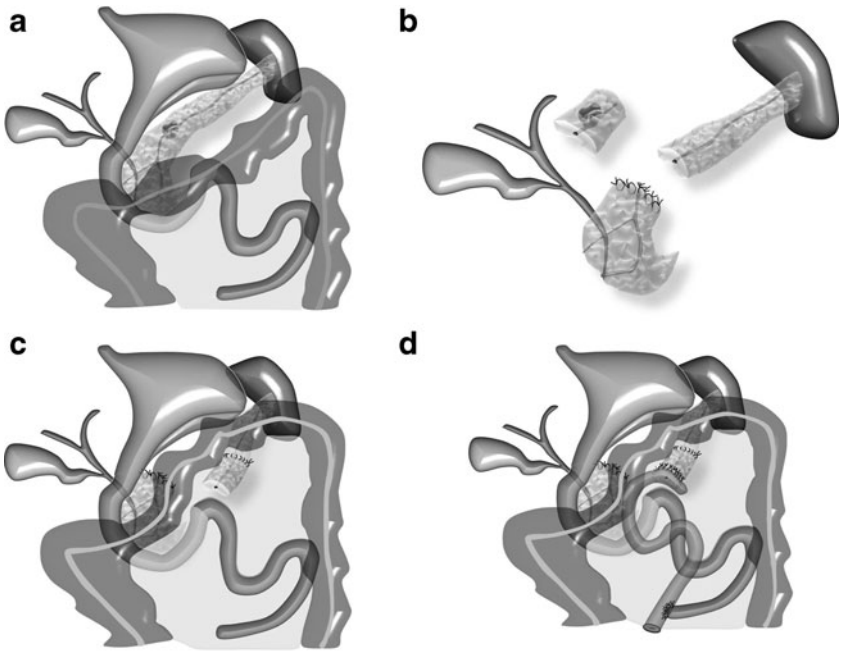

Fig. 1 **a** A small pancreatic tumor is located between the neck and the medial portion of pancreatic body. Central pancreatectomy is a conservative option for the treatment of this tumor. **b** The specimen consists of a small pancreatic segment around the tumor, leaving two pancreatic margins to manage. **c** The right-sided pancreatic stump is closed. The left-sided pancreatic margin is brought into the inframesocolic intraperitoneal space, through a small defect in the transverse mesocolon. **d** After completion of pancreatojejunostomy, the two pancreatic stumps are segregated into different body districts (i.e., the right-sided stump in the retroperitoneum and the left-sided stump in the intraperitoneal space)

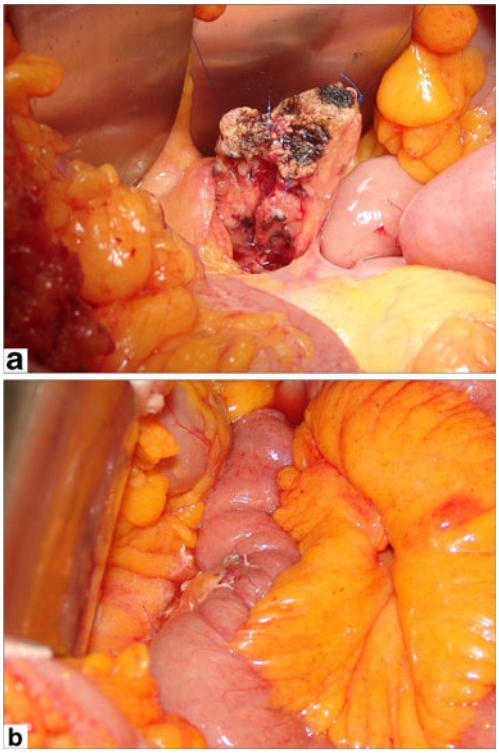

Fig. 2 **a** Intraoperative photograph showing the margin of the left-sided pancreatic stump peeping out the mesocolic window into the inframesocolic intraperitoneal compartment. **b** Intraoperative photograph showing the completed inframesocolic intraperitoneal pancreatojejunostomy

No patient developed diabetes or exocrine insufficiency. In particular, fecal chymotrypsin activity and fecal elastase concentration were both normal in all patients.

Discussion

CP removes a limited segment of pancreatic parenchyma but requires handling of two pancreatic remnants located just few centimeters apart in the supramesocolic space behind the stomach. This anatomic region, deep and narrow, is crossed by the large peripancreatic vessels (splenic vein, portal/superior mesenteric vein, common hepatic artery, splenic artery) that are typically denuded during surgery and may hence become involved in local complications [10]. A review of the literature from 1998 to 2010, gathering 436 CP (Table 2) [1–7, 11–21], shows that the high morbidity rate of CP (average 45%; range, 23–92%) is mostly caused by PF (average 32%; range, 8–62%). Although interpretation of these data may not be straightforward, because of the use of different definitions of PF, it is clear that PF fistula is the main determinant of postoperative morbidity of CP. In most instances, local complications of PF pursue a rather benign course (mortality rate, 1.1%; 5/436), but more often (4%), repeat surgery becomes necessary, including completion distal pancreatectomy [17]. Major vascular complications actually occur in more patients and may require interventional vascular radiology procedures for permanent control or as a bridge to surgical repair [1, 7, 14, 17]. Overall, severe local complications, requiring either arterial embolization or surgical reintervention, occur in some 6% of patients (Table 2).

From the point of view of surgical technique, treatment of proximal stump has few alternatives. Nearly all authors elect to close it, usually by selective ligature of the main pancreatic duct plus oversewing of the adjacent pancreatic parenchyma. The use of staplers is less prevalent [1–3, 16–22], probably because at the level of the transection line, the pancreas is rather wide and hence difficult to seal using mechanical devices. As described by Müller and coworkers, closure of the proximal stump may be reinforced by approximating to it the seromuscular layer of the bowel loop used for pancreatojejunostomy [1]. The proximal stump may also be left open and anastomosed to the intestine [1].

Management of distal pancreatic remnant is more controversial, despite mostly revolving around various modifications of both Roux-en-Y pancreatojejunostomy and pancreatogastrostomy. Our literature review shows that duct occlusion is used infrequently (3%), and that pancreatojejunostomy is prevalent (61%) over pancreatogastrostomy (36%; Table 2). Overall, the general picture is not too different from the one existing in pancreatoduodenectomy where no surgical technique is immune from failure, and all should be available to meet the needs of the individual patient. What can be different is the specific weigh of PF after CP. Indeed, potentially life-threatening complications are probably more acceptable in patients diagnosed with high-grade malignancies and/or without real treatment alternatives, which usually is not the case of patients undergoing CP.

Development of more effective surgical techniques for CP is in part hampered by lack of specific information on the site of origin of PF. The technique we have described herein allows to segregate the two pancreatic stumps into different body compartments, provided that the distal stump is managed by pancreaticojejunostomy. Our experience shows that most PF originate from the right-sided pancreatic stump. The information, if confirmed in larger series, could be used to test new methods of closure of the proximal pancreatic stump, or could contribute to remove some of the safety concerns that surround CP, by providing a reason for the often benign course of PF after CP. Even if the technique we are proposing neither affects the rate nor modifies the anatomy of PF originating from the right pancreatic stump, having a barrier between the leaking remnant and the fragile pancreaticojejunostomy could be an additional caution.

Table 1 Summary of clinical course

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8
Baseline characteristics								
Age (years)	27	59	43	53	29	39	49	63
Sex	Male	Female	Female	Female	Female	Male	Female	Male
Body mass index (kg/m^2)	25.3	32.2	27.3	26.2	24.6	28.5	27.7	33.6
Operative approach	Open	Open	Laparoscopic	Laparoscopic	Laparoscopic	Open	Open	Open
Postoperative day 3								
Serum amylase[a]	45	78	83	66	92	64	82	96
Right drains								
Volume (ml)	15	20	40	15	20	10	15	20
Amylase (U/L)	390	63	740	42	980	58	80	560
Left drains								
Volume (ml)	10	30	25	25	40	10	30	10
Amylase (U/L)	48	580	62	77	85	60	75	88
WBC count[b]	7,680	8,330	6,780	5,460	8,950	6,840	7,450	8,650
Fever	No	No	No	No	No	No	No	No
Complaints	None	None	None	None	None	None	None	None
Pancreatic fistula								
ISGPF grade	A	B	A	–	B	–	–	A
Postoperative course								
Fluid collections	No	No	No	No	No	No	No	No
Percutaneous catheter drainage	No	No	No	No	No	No	No	No
NPO	No	No	No	No	No	No	No	No
Parenteral nutrition	No	No	No	No	No	No	No	No
Somatostatin analogues	No	Yes	No	No	Yes	No	No	No
Drains out (POD)								
Right drains	5	5	6	4	22	4	5	7
Left drains	5	18	5	4	5	4	4	4
Reoperation	No	No	No	No	No	No	No	No
LOS (days)	8	23	10	7	26	7	10	9
Pathology								
Tumor type	Insulinoma	Serous Cystad.	Branch-Duct IMPN	Solid Pseudop. T.	Solid Pseudop. T.	Mucinuos Cystad.	Mucinuos Cystad.	Branch-Duct IMPN
Tumor diameter (mm)	22	28	40	35	42	35	38	36
Long-term outcome								
Follow-up (months)	37	33	31	27	21	16	11	2
Diabetes	No	No	No	No	No	No	No	No

Table 1 (continued)

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8
Oral enzymes	No	No	No	No	No	No	No	No
Fecal chymotrypsin	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Fecal elastase	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal

BMI body mass index, *NPO* nothing by mouth, *IMPN* intraductal papillary mucinous neoplasm, *POD* postoperative day, *LOS* length of hospital stay, *Cystad.* cystoadenoma, *Solid Pseudop. T.* solid pseudopapillary tumor

[a] Normal serum amylase concentration, 10–100 U/L

[b] White blood cell (WBC) count reference values, 4.500–10.000/ml

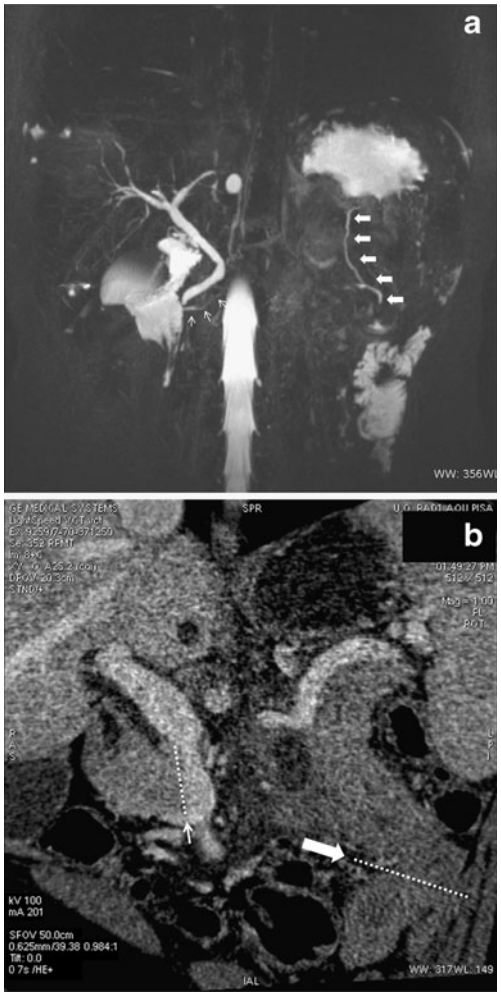

Fig. 3 **a** MIP reconstruction in the coronal plane from MRCP sequences showing the near vertical orientation of the main pancreatic duct in the distal pancreatic stump (*large arrows*). *Thin arrows* point at main pancreatic duct in the cephalic remnant. **b** MPR reconstruction in the coronal plane obtained from the venous phase of multislice computed tomography scan. *Large arrow* indicates the cut edge of the distal pancreatic remnant; *thin arrow* points at the cut end of the cephalic pancreatic remnant

From a technical point of view, segregation of the two pancreatic stumps into different body compartments adds little to the complexity of CP, since construction of inframesocolic intraperitoneal pancreatojejunostomy only requires that the cut edge of the distal pancreatic stump is fit into a small defect in the overlaying transverse mesocolon. Considering that, at this level, the transverse mesocolon is typically filmy, the distal pancreatic stump does not need to be mobilized more extensively than for standard reconstruction. In obese patients with thick mesocolon and presumably bulky, fat-infiltrated, pancreas, the pancreatic remnant might require more extensive preparation or simply this procedure might not be convenient or feasible.

The final proof of the actual segregation of the two pancreatic stumps into different body compartments would

Table 2 Summary of recent literature on central pancreatectomy

First author [ref.] (year)	Mean age	Patients	Proximal stump	Distal stump						Morbidity		Fistula		Arterial embolization		Reoperation		Mortality	
				PJ		PG		CL											
				n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Shikano [4] (2010)	58.0 years	26	CL	2	8%	24	92%	0	–	10	38%	8	31%	0	–	3	12%	0	–
Sudo [7] (2010)	60.0 years	19	CL	3	16%	16	84%	0	–	10	53%	9[a]	47%	1	5%	0	–	0	–
Hirono [12] (2009)	69.0 years	24	NA	21	88%	3	12%	0	–	7	29%	15	62%	0	–	0	–	1	4%
Wayne [13] (2009)	54.0 years	10	CL	0	–	0	–	10	100%	4	40%	0	–	0	–	0	–	0	–
Shah [14] (2009)	29.5 years	4	CL	4	100%	0	–	0	–	0	–	0	–	0	–	0	–	0	–
Ocuin [3] (2008)	55.0 years	13	CL	6	46%	7	54%	0	–	12	92%	8	62%	0	–	0	–	1	8%
Adham [15] (2008)	NA	50	CL	6	12%	44	88%	0	–	23	46%	4	8%	1	2%	6	12%	0	–
Crippa [2] (2007) [b]	52.0 years	100	NA	95	95%	5	5%	0	–	58	58%	44	44%	0	–	0	–	0	–
Allendorf [16] (2007)	56.0 years	26	CL	0	–	26	100%	0	–	8	31%	2	17%	0	–	0	–	0	–
Sa Cunha [17] (2007) [c]	55.0 years	6	CL	0	–	6	100%	0	–	2	33%	2	33%	0	–	0	–	0	–
Christein [18] (2006)	63.0 years	8	CL	8	100%	0	–	0	–	?	?	5	62%	2	25%	2	25%	0	–
Roggin [19] (2006)	NA	10	CL	9	90%	1	10%	0	–	6	60%	3	30%	NA	–	1	10%	0	–
Müller [1] (2006)	53.0 years	40	CL[d] or anastomosed	40	100%	0	–	0	–	17	42%	NA	–	2	5%	2	5%	1	2,5%
Efron [20] (2004)	60.9 years	14	CL	14	100%	0	–	0	–	7	50%	5	36%	0	–	2	14%	1	7%
Shibata [5] (2004)	58.0 years	10	CL	10	100%	0	–	0	–	5	50%	3	30%	0	–	0	–	0	–
Sauvanet [6] (2002) [b]	49.0 years	53	CL	26	49%	25	47%	2	4%	22	41%	16	30%	0	–	3	6%	1	2%
Sperti [21] (2000)	45.7 years	10	CL	10	100%	0	–	0	–	4	40%	3	30%	0	–				
Iacono [22] (1998)	51 years	13	CL	13	100%	0	–	0	–	3	23%	2	15%	0	–	0	–	0	–
Total	–	436	–	267	61%	157	36%	12	3%	198	45%	129	32%	6	1.4%	19	4%	5	1.1%

Ref reference, *CL* duct ligature with or without parenchyma oversewing, *NA* not available, *PJ* pancreatojejunostomy, *PG* pancreatogastrostomy

[a] Only grade B and C fistulas according to the International Study Group on Pancreatic Fistula (ISGPF) recommendations

[b] Multi-institution series

[c] Laparoscopic operations

[d] The proximal stump, after stapler closure, is covered by the same jejunal loop used for pancreaticojejunostomy

probably require trans-drainage injection of methylene blue dye, without evidence of bluish coloration in contralateral drains, or injection of contrast medium under fluoroscopic guidance. We have preferred to avoid these more direct demonstrations to spare our asymptomatic patients the risks of contamination and/or infection. On the other hand, the concentration of pancreatic enzymes in the fluid obtained from the site of PF was at least seven-fold higher than in contralateral drains. Considering that drained fluid volumes were extremely low, even a small communication between the two compartments would have reduced this sharp difference.

The presence of transverse mesocolon, besides segregating the two pancreatic remnants, creates an anatomic barrier between pancreatojejunostomy and the naked peripancreatic vessels. This "new anatomy" might prevent direct leakage of pancreatic juice over the peripancreatic vessels possibly reducing the occurrence of local vascular complications. On the other hand, PF, if not drained completely, could result in generalized peritonitis, either pure chemical peritonitis or contaminated peritonitis. This is one of the reasons for which we decided to place two closed suction drains around this anastomosis. We speculated, however, that PF, if not completely drained, could entail more serious consequences if placed in the retroperitoneum, a hyporeactive milieu where infection may arise and develop silently. Further, as shown by pancreas transplantation [23], the peritoneum can reabsorb PF.

Admittedly, since we have presented only a handful of cases, we cannot claim that inframesocolic intraperitoneal pancreatojejunostomy is safer, or better in any respect, than the conventional supramesocolic retroperitoneal anastomosis. Comparing this experience with our historical series, as well as with other series from the literature, would add little information to this discussion since comparison with non-contemporary series is likely to be biased by the use of different diagnostic criteria of PF. The final proof of the superiority of any technique for CP is indeed difficult to obtain since operative mortality is so low that a prospective randomized study, powered enough to show a difference, is hard to cumulate in the face of the limited spectrum of indications to CP. Our modified technique, however, provides a model to define the origin of PF in the setting of CP.

Our results confirm the high risk of PF after CP. The 62.5% rate of PF we have reported, if on one hand reflects the stringent classification criteria we have used [9], on the other might be biased by the small number of patients, possibly magnifying the relevance of single events. Three of the four PF were grade A PF and would not have been identified if we had not systematically assayed amylase concentration in drained fluids. Likewise, the fact that the mean length of hospital stay in our experience exceeded 12.5 days does not necessarily reflect the actual need of in-hospital care and was certainly affected by our overprotective policy in discharging patients diagnosed with benign tumors and treated with a modified surgical technique. Our policy is not too different from the one used at the University of Verona (Italy), as recently published in a combined paper with the Massachusetts General Hospital (USA) [2]. In this combined series, the mean length of hospital stay was 13±9.5 days, and it was longer at the University of Verona (16.5±10 days) than at the Massachusetts General Hospital (7.5±3 days; p=0.0001). Actually, the mean length of hospital stay at the University of Verona was 19±11 days in the first 29 patients, and 14±9 days in the last 33 patients [2]. This difference is probably explained, as in our series, by the extremely safe policy adopted in the initial experience with a highly morbid operation such as CP. Further, as discussed by Crippa et al., the shorter period of hospital stay of American patients not only reflects general differences in the health policy between the two hospitals and the two countries but also different policies of drain management. As described in the Verona experience, drain removal in our patients was delayed until hospital discharge resulting in longer hospital stay, but sparing readmissions and percutaneous drainage of intra-abdominal collections.

Three of our patients were operated laparoscopically under robotic assistance. Safety and feasibility of CP using the robot is confirmed by few studies [24–26], even if the rate of PF does not seem to be reduced [27]. Since patients who do not suffer from postoperative complications do impressively well, we believe that robotic pancreatic resection and reconstruction can be pursued in selected patients at high volume centers.

In conclusion, when CP is indicated, construction of inframesocolic intraperitoneal pancreatojejunostomy is a possible alternative to standard techniques. Segregation of the two pancreatic stumps allows selective identification of the site of origin of PF and provides information that could be useful in managing the single patient as well as in refining the surgical technique. Interposing the mesocolon between pancreatojejunostomy and peripancreatic vessels creates an anatomic barrier and could reduce the incidence of local vascular complications. On the other hand, having the pancreatojejunal anastomosis in the intraperitoneal space could result in generalized peritonitis in case of PF not completely caught by peripancreatic drains.

Conflicts of interest None.

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