Laparoscopic External Pancreatic Stenting in Pancreaticoduodenectomy with High-Risk Glands: Early Experiences and Outcomes

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Background: Post-operative pancreatic fistula (POPF) is an important complication following pancreaticoduodenectomy. External pancreatic stenting has been used to reduce this risk in the open operative setting. External pancreatic stenting has not yet been described laparoscopically.

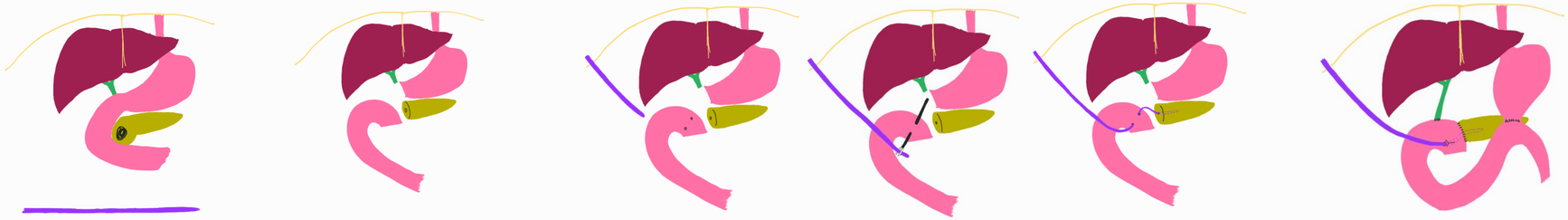
Methods: Between 2020-2023, patients who underwent laparoscopic pancreaticoduodenectomy with placement of an external pancreatic stent for any indication were retrospectively analyzed.

Results:

- 34 patients received laparoscopic external pancreatic stent
- Stent function defined as average >50cc output/day for first 3 post operative days
  - 25 stents functioning, 6 stents nonfunctioning, 3 stents unknown
  - 67% of the nonfunctioning stents occurred in the first half of the series
- There was a trend towards lower observed compared to expected leak rate (based on updated alternative fistula risk score) in functioning stents, and higher observed compared to expected leak rate in nonfunctioning stents
  - 20% leak rate in functioning stents, 50% leak rate in nonfunctioning stents
- Patients with functioning stents had fewer severe in-hospital complications (Clavien Dindo IV or V) related to POPF (1 vs 2), and shorter median length of stay (8 days vs 18.5 days).

Conclusion: Laparoscopic external pancreatic stent placement is feasible and, in this series, appears to be associated with better post-operative outcomes.

Surgical Technique



What you'll need

- Pancreatic head lesion
- 8Fr pediatric feeding tube. We cut extra side holes to facilitate further drainage

Standard Whipple resection

Introduction of pediatric feeding tube

- Pediatric feeding tube is introduced through a separate abdominal wall incision
- Two enterotomies are made in the biliopancreatic limb and the feeding tube is passed through

Standard reconstruction

- Standard Whipple reconstruction is performed and external stent is secured with Witzel stitch

Outcomes from the first 34 patients

Average age	67.5
% Female	0.47
Type of operation	
Pathology	
Pancreatic adenocarcinoma	12
Ampullary adenocarcinoma	5
Duodenal adenocarcinoma	3
Duodenal adenoma	2
IPMN	5
cholangiocarcinoma	5
Neuroendocrine tumour	3
BMI	28.1
Duct texture	
Soft	27
Medium	5
Unknown	2
Average duct diameter (mm)	3.4

Table 1. Patient demographics

	All Stents	Functioning Stent	Non-Functioning Stent	Unknown stent function
Number	**34**	25	6	3
Average output over first 3 post op days (cc/day)	**149**	177	31.7	-
Any POPF	**14 (41%)**	10 (40%)	4 (67%)	0
Grade B/C POPF	**8 (24%)**	5 (25%)	3 (50%)	0
In hospital complication	**22 (65%)**	17 (68%)	3 (50%)	2 (67%)
Severe complication	**5 (15%)**	1 (4%)	2 (33%)	2 (67%)
Median length of stay (days)	**8**	8	18.5	7
30-day readmission	**7**	7	0	0
30-day reoperation	**5**	2	2	1

Table 2. Perioperative outcomes stratified by stent function. Functional stent defined as average stent output >50cc/day over first 3 post operative days.

	Observed leak rate	Expected Leak rate
All	0.24	0.39
Functioning stent	0.2	0.37
Non-functioning stent	0.5	0.40
Unknown stent function	0	0.59

Table 3. Observed vs expected leak rate. Leak rate calculated using updated alternative fistula risk score