



## Invited Commentary

# What type of pancreatic anastomosis is safest following pancreaticoduodenectomy? An invited commentary on “Critical appraisal of the techniques of pancreatic anastomosis following pancreaticoduodenectomy: A network meta-analysis” (Int J Surg 2019;73:72–7)



## ARTICLE INFO

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A pancreatic fistula following pancreaticoduodenectomy (PD) is the most common complication causing major comorbidity, with an incidence of 2–28% [1]. Several techniques have been described to reconstruct the remainder part of the pancreas following PD (Table 1). A recent meta-analysis which analyzed randomized controlled trials demonstrated that pancreaticogastrostomy (PG) reconstruction was superior to pancreaticojejunostomy (PJ) reconstruction for prevention of pancreatic fistula after PD [2].

In the current issue of International Journal of Surgery, Ratnayake et al. [3], aimed to determine the best pancreatic reconstruction technique after PD which results with minimal pancreatic fistula and therefore less morbidity and mortality. They ran a powerful network meta-analysis (NMA) comparing randomized controlled trials in pancreas reconstruction following PD in the era of International Study Group of Pancreatic Fistula (ISGPF) definition of pancreatic fistula grading system [4]. Despite some limitations, the NMA allowed authors to perform simultaneous direct and indirect comparisons through Bayesian modeling while maintaining randomization. The study compared 5 techniques of pancreas reconstruction following PD using 15 randomized controlled trials and included a cohort of 2,428 patients. Of those, 791 patients (32%) underwent PJ with end-to-side invagination, 971 patients (40%) underwent PJ with end-to-side duct-to-mucosa, 505 patients (21%) underwent PG end-to-side invagination, and 98 patients (4%) underwent PG duct-to-mucosa pancreas anastomoses [3].

In the primary outcome measure (clinically relevant pancreatic fistula), Ratnayake et al. found that PG duct-to-mucosa technique was the best pancreas anastomosis technique with the lowest fistula rate while PJ end-to-side duct-to-mucosa technique resulted as the worst reconstruction technique with the highest fistula rate [3]. Moreover, the authors studied secondary outcomes, such as (i) intraoperative blood loss, (ii) operative time, (iii) delayed gastric emptying, (iv) intra-abdominal abscess, (v) all post-operative morbidity, (vi) significant post-operative morbidity, (vii) reoperations, (viii) post-operative hospital stay, and (ix) post-operative mortality. Out of 9 secondary outcomes carefully compared amongst the included randomized controlled trials, authors found that PG duct-to-mucosa technique was superior in

all outcomes, except significant post-operative morbidity, and reoperations [3]. While significant post-operative morbidity outcome was superior in PG invagination technique, reoperation outcome was found to be better in PJ end-to-side invagination.

The evidence-based medicine is improving with powerful meta-analyses which compare randomized controlled trials, despite some limitations. The landscape of surgery and surgical techniques are changing with a better understanding of immediate and long-term outcomes in patients' morbidity and mortality. Although the desired outcome would be an absolute zero in patients' morbidity and mortality, our goal in future studies as well as in hepatopancreaticobiliary surgery training should be the inclusion of the best practice in pancreatic reconstruction following PD.

## Disclosure

Authors declare no conflict of interest.

## Provenance and peer review

Invited Commentary, internally reviewed.

Table 1

Types of pancreas reconstruction following pancreaticoduodenectomy.

Type of anastomosis	Technique of anastomosis
Pancreatojejunostomy	End-to-end direct suturing
	End-to-end invaginating/dunking
	End-to-side single layer $\pm$ invaginating
Pancreatogastrostomy	End-to-side duct-to-mucosa
	End-to-side duct-to-mucosa
	End-to-side invaginating/telescopically
	End-to-side direct suturing

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## Declaration of competing interest

None.

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Burcin Ekser\*

*Department of Surgery, Indiana University School of Medicine, Indianapolis, IN, USA*

*E-mail address:* [bekser@iupui.edu](mailto:bekser@iupui.edu).

Michele Valmasoni

*Department of Surgical, Oncological and Gastroenterological Sciences, University of Padova, Padova, Italy*

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\* Corresponding author. Department of Surgery, Indiana University School of Medicine, 550 University Blvd, Room 4601, Indianapolis, IN, USA.