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Pancreaticogastrostomy versus pancreaticojejunostomy

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ABSTRACT

Background: It has long been debated whether pancreaticogastrostomy (PG) or pancreaticojejunostomy (PJ) is the better choice for reconstruction after pancreaticoduodenectomy. The purpose of this study is to evaluate the two techniques.

Methods: Randomized controlled trials (RCTs) comparing PG with PJ published from January 1995 to January 2014 were searched electronically using PubMed, Medline, and Cochrane Library. Published data of these RCTs were analyzed using either fixed-effects model or random-effects model.

Results: Seven RCTs were included in this meta-analysis, with a total of 1121 patients (562 in PG, 559 in PJ). The incidence of postoperative pancreatic fistula and intra-abdominal fluid collection were significantly lower in PG than in PJ (respectively: odds ratio = 0.53 [0.37, 0.74], $P < 0.001$; odds ratio = 0.48 [0.30, 0.76], $P < 0.01$), no significant difference could be found for delayed gastric emptying, hemorrhage, morbidity, reoperation rate, and mortality.

Conclusions: The evidence from RCTs suggests that PG technique is associated with a lower rate of postoperative pancreatic fistula and intra-abdominal fluid collection than PJ.

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1. Introduction

Pancreaticoduodenectomy (PD) is the standard of care for patients with pancreatic cancer and other periampullary diseases [1,2], however, postoperative complications of PD are still common. Postoperative pancreatic fistula (POPF) and delayed gastric emptying (DGE) are the principal complications of PD and sometimes may be fatal [3,4]. Other complications such as postoperative wound infections, intra-abdominal fluid collection (IFC), and hemorrhage are also common after PD [5]. In clinical practice, various techniques or modifications were carried out to minimize the complications of PD, pancreaticogastrostomy (PG) and pancreaticojejunostomy (PJ) were initially designed to reduce these complications [6,7].

Though the site of anastomosis was different, both of them were designed to create a permanent internal drainage system of pancreatic juice, thus far they have been used for >50 y, it is still unknown which one is better. Up to date, many studies comparing PG with PJ have been reported, some of them suggested that PG may decrease the morbidity of POPF and other complications, others considered that the type of pancreatoenteric anastomosis did not significantly influence the outcomes, recommendations from the previous trials seems inconsistent [8–12]. In 2006, a meta-analysis suggested that PG has a lower rate of POPF and overall morbidity, in contrast, a recent meta-analysis indicated that PG is not superior to PJ in terms of postoperative complications, however, much evidence of both studies came from observational cohort studies [13,14].

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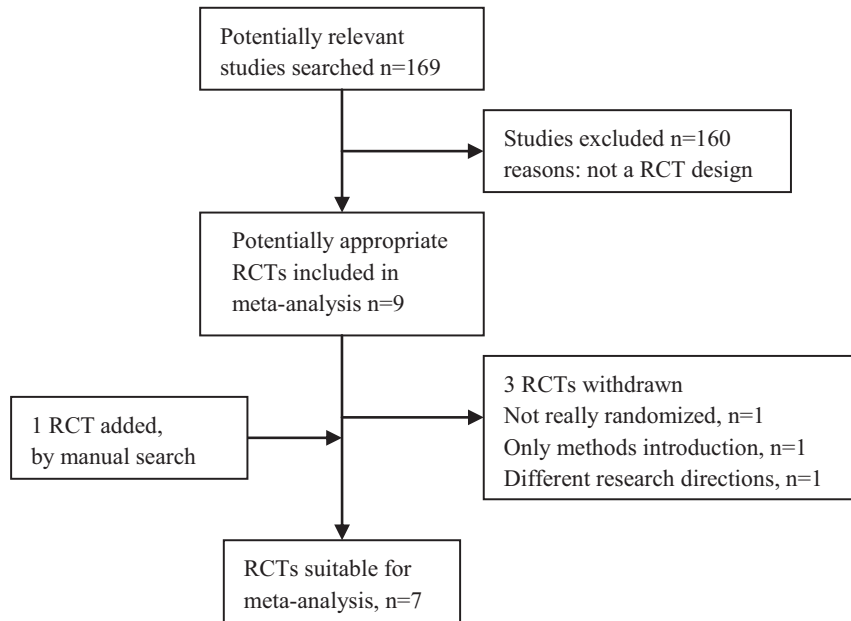


Fig. 1 – Flow diagram of the RCTs identified in this meta-analysis.

To evaluate the effect of two techniques after PD, we carried out a meta-analysis of all possible randomized controlled trials (RCTs) comparing PG with PJ. The primary end point is the rate of POPF. Secondary end points include DGE, hemorrhage, morbidity, reoperation rate, and mortality.

2. Methods

2.1. Inclusion and exclusion criteria

Eligible studies were included in this meta-analysis if they met the following criteria: (1) an RCT study design; (2) PD was performed in all patients; (3), and raw data can be extracted and written in English. Studies that did not meet the aforementioned criteria, without data for retrieval or duplicate publications were excluded.

2.2. Search strategy and data collection

A comprehensive literature search of the PubMed, Medline, and Cochrane Library databases was carried out from January

1995 to January 2014, identifying randomized clinical trials that compared PD with PJ. The following medical key words were used: “PG”, “pancreatogastrostomy”, “PJ”, “pancreatojejunostomy”, “pancreatoduodenectomy”, “comparative studies”, “RCTs”, and “clinical trials”. Manual search was also performed to identify possible trials for analysis.

All the RCTs were analyzed for quality to evaluate validity using the risk of bias table, data were extracted and checked doubly, including number of patients in each group, gender, mean age, anastomotic technique, definition of pancreatic leak, and the morbidity of all kinds of complications. Data were extracted blindly and independently from each study by two of the authors, disagreements were resolved by discussion with a third investigator.

2.3. Statistical analysis

Statistical analysis was performed using the Cochrane Collaboration software (RevMan version 5.2; <http://ims.cochrane.org/revman>). Meta-analysis was carried out with a fixed-effects or a random-effects model. All the data were analyzed by both fixed-effects model and random-effects

Table 1 – Characteristics of RCTs comparing PG with PJ included in the study.

Authors	Region	Years of study	Interventions	Setting	Cases PG/PJ	Mean age (y) PG/PJ	Sex (male %) PG/PJ	Hospital stay (d) PG/PJ	Operating time (h) PG/PJ
Yeo (1995)	USA	1993–1995	PG versus PJ	Single center	73/72	62/62	45/53	17.1/17.7	7.4/7.2
Bassi (2005)	Italy	2002–2004	PG versus PJ	Single center	69/82	59/56	64/62	14.2/15.4	5.6/5.9
Duffas (2005)	France	1995–1999	PG versus PJ	Multicenter	81/68	58/59	63/52	20/21	6.5/6.4
Fernandez-cruz (2008)	Spain	2005–2007	PG versus PJ	Single center	53/55	63/63	55/69	12/16	5.5/5.2
Wellner (2012)	Germany	2006–2011	PG versus PJ	Single center	59/57	67/64	62/54	15/17	6.7/7.4
Topal (2013)	Belgium	2009–2012	PG versus PJ	Single center	162/167	67/66	46/51	19/18	4.2/4.2
Figueras (2013)	Spain	2008–2012	PG versus PJ	Multicenter	65/58	67/66	68/64	12/15.5	5.5/5.1

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