

INPLASY PROTOCOL

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Is Blumgart anastomosis superior to conventional pancreaticojejunostomy after pancreaticoduodenectomy? A protocol for a systematic review and meta-analysis

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Review question / Objective: Is Blumgart anastomosis superior to conventional pancreaticojejunostomy after pancreaticoduodenectomy? Is Blumgart anastomosis effective and safe for pancreaticojejunostomy after pancreaticoduodenectomy?

Condition being studied: Blumgart anastomosis (BA) has been found with some advantages in decreasing the POPF comparing with the conventional PJ, either duct to mucosa or invagination approach. However, there was no exact evidence about this topic. This systematic review and meta-analysis is the first study to obtain the evidence about the safety and effectiveness of BA versus conventional PJ after PD.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 04 May 2020 and was last updated on 04 May 2020 (registration number INPLASY202050012).

INTRODUCTION

Review question / Objective: Is Blumgart anastomosis superior to conventional pancreaticojejunostomy after pancreaticoduodenectomy? Is Blumgart anastomosis effective and safe for pancreaticojejunostomy after pancreaticoduodenectomy?

Rationale: This systematic review and meta-analysis is the first study to obtain the evidence about the safety and effectiveness of Blumgart anastomosis versus conventional pancreaticojejunostomy after PD.

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METHODS

Search strategy: The randomized clinical trials (RCTs) and comparative studies which compared with the outcomes between the BA and conventional PJ were analyzed according to PRISMA guidelines. The PubMed, EMBASE, and the Cochrane Library were systematically searched for studies that published from January 2000 to March 2020. The following search terms were chosen to screen databases from January 2000 (the first Blumgart anastomosis was described in 2000) to March 2020, such as pancreaticoduodenectomy, pancreatoduodenectomy, Whipple, pancreatoduodenal resection, pancreaticojejunostomy, duct-to-mucosa, invagination Blumgart anastomosis along with their synonyms or abbreviations.

Participant or population: The patients had performed PD with either benign or malignant disease of the pancreatic head and/or periampullary region.

Intervention: Blumgart anastomosis.

Comparator: Conventional pancreaticojejunostomy construction (including Cattell–Warren anastomosis, Kakita anastomosis and invagination pancreaticojejunostomy).

Study designs to be included: The randomized clinical trials (RCTs) and comparative studies which compared with the outcomes between the BA and conventional PJ were analyzed accord.

Eligibility criteria: English language articles published in peer-reviewed journals; human studies; studies with at least the primary outcome mentioned; only comparative clinical trials with full-text descriptions; clear documentation of the pancreaticojejunostomy technique and where multiple studies came from the same institute and/or authors, either the higher quality study or the more recent publication was included in the analysis.

Information sources: The PubMed, EMBASE, and the Cochrane Library were systematically searched for studies that published from January 2000 to March 2020. Data were extracted independently by two reviewers using standard forms and cross-checked. Inconsistencies were resolved through discussion until consensus was reached, or a third reviewer would take part in the discussion.

Main outcome(s): Postoperative pancreatic fistula (POPF).

Additional outcome(s): Population characteristics (age, gender, BMI), intraoperative conditions (type of anastomosis, pancreatic texture, mean main pancreatic diameter, operative time and intraoperative blood loss) and postoperative parameters (CR-POPF, DGE, intra-abdominal abscess, bile leakage, wound infection, morbidity, mortality, reoperation, duration of drainage and postoperative hospital stay) in each study.

Data management: Data were extracted independently by two reviewers using standard forms and cross-checked. Inconsistencies were resolved through discussion until consensus was reached, or a third reviewer would take part in the discussion.

Quality assessment / Risk of bias analysis: The RCT was assessed according to the Jadad scoring system, which takes the randomization and double-blinding process into consideration, as well as a description of withdrawals or drop-outs. Note was also made of the sample size calculation, sequence generation, allocation

concealment and definitions of outcome parameters. Observational studies were assessed as described by McKay and colleagues, including assessment of data collection (prospective versus retrospective), assignment to BA or conventional PJ group by means other than the surgeon's preference, and an explicit definition of POPF (studies were given a score of 1 for each of these areas, giving a total score of 1–4). Continuous variables were presented as the mean with corresponding standard deviations to be pooled in the meta-analysis. When the trials had reported medians and ranges instead of means and standard deviations, the estimation methods were used basing on the literature.

Strategy of data synthesis: Continuous variables were presented as the mean with corresponding standard deviations to be pooled in the meta-analysis. When the trials had reported medians and ranges instead of means and standard deviations, the estimation methods were used basing on the literature.

Subgroup analysis: Subgroup analysis was performed by comparing BA versus CWA, BA versus KA, and BA versus invagination PJ.

Sensibility analysis: Data analyses were performed using Review Manager 5 software (The Cochrane Collaboration, Oxford, UK). Heterogeneity was evaluated by means of the χ^2 test, with $P \leq 0.10$ considered to represent a significant difference. I^2 values were used for the evaluation of statistical heterogeneity; an I^2 value of 50 percent or more indicated the presence of heterogeneity. Initially a fixed-effects model was used to synthesize all data. With regard to outcomes when significant heterogeneity existed across studies, sensitivity analysis was performed by sequentially omitting each study to test the influence of individual study on pooled data. However, if there was evidence of heterogeneity among the included studies, random-effects analysis according to DerSimonian and Laird was used. Clinical heterogeneity could be explained by

different definitions of outcome parameters, and variability of interventions and perioperative management. The result of meta-analysis was presented as WMD or OR with 95 percent confidence intervals (CI).

Language: English.

Country(ies) involved: China.

Other relevant information: No.

Keywords: Blumgart anastomosis, pancreaticojejunostomy, pancreaticoduodenectomy, duct-to-mucosa, invagination.

Dissemination plans: No.

Contributions of each author:

Author 1 - Zhenglu Li - Designed, perform, assess the studies and wrote the paper.

Author 2 - Ailin Wei - Designed and assess the studies.

Author 3 - Ning Xia - Assessed the studies included in this review and collected the data.

Author 4 - Liangxia Zheng - Assessed the studies included in this review and collected the data.

Author 5 - Dujiang Yang - Analysed the data.

Author 6 - Jun Ye - Analysed the data.

Author 7 - Junjie Xiong - Performed the study and wrote the paper.

Author 8 - Weiming Hu - Reviewed the manuscript.