

RETROSPECTIVE COHORT ANALYSIS OF RISK FACTORS FOR CLINICALLY RELEVANT POSTOPERATIVE PANCREATIC FISTULA FORMATION

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Introduction: Pancreatic fistula is a significant complication following pancreaticoduodenectomy and contributes to up to half of all postoperative mortality from this procedure. A clinically relevant post-operative pancreatic fistula (CR-POPF) is defined as a drain output with an amylase level three times the upper limit of serum amylase level that also requires a change in postoperative management of the patient. Because of their impact, great efforts have been made to identify causes and risk factors for pancreatic fistula formation.

Study Design: A retrospective chart review was performed at Methodist Richardson Medical Center, a high-volume tertiary care center, under the approval of the institutional review board. All patients who underwent an open Whipple surgery between 2020 and 2023 (by three high-volume HPB surgeons) were identified through the electronic medical record using Current Procedural Terminology (CPT) codes corresponding to the Whipple surgery and underwent a detailed chart review. Informed consent was waived due to the retrospective nature of this study. We conducted the study in accordance with the principles outlined in the Declaration of Helsinki.

Analysis: Retrospective cohort analysis from October 2018 to August 2023. Patient demographics, preoperative variables, intraoperative variables, and postoperative outcomes were analyzed using SPSS software (version 29.0). Univariate logistic regression was used to identify possible risk factors for CR-POPF using the respective Odds Ratio charted on the Forrest Plot. Cut-offs were ascertained using Youden’s index on the respective ROC curves. In addition to commonly reported risk factors, this study also investigated if preoperative albumin and bilirubin levels, preoperative biliary drainage, and intraoperative fluid administration lead to an increase in fistula formation.

Results: Analysis showed a decreased pancreatic duct diameter and soft pancreatic gland texture as strong risk factors for CR-POPF. Additionally, lower volume of intraoperative fluid administration was independently associated with formation of CR-POPF. A sequential multivariate regression analysis was performed to see the combined effect of pancreatic duct diameter, intraoperative fluid administration, and pancreatic gland texture. With each addition of a variable to the model, there was increased predictive performance for formation of POPF compared to any individual variable. PD diameter, pancreatic gland texture, and intraoperative fluid volume can be readily recorded during surgery, and our findings show potential benefit for development of a future intraoperative risk calculator to better predict the probability of POPF formation.

