

12 - Title: Robotic Vs Open Whipple Has Less Perioperative Complications: A Comprehensive Updated Meta-Analysis

Author(s): Claire H Parker, Shabnam Parsa, David Resstle MD, Georgios V Georgakis MD

Faculty Mentor(s): Georgios V Georgakis MD

Background:

Pancreatic cancer of the head of the pancreas requires a toxic chemotherapy and a technically complex surgery. Robotic Pancreatoduodenectomy (RPD) has been established in the past decade as a safe and effective procedure for patients with pancreatic head cancer, however, we do not yet have any direct comparison to the open Pancreatoduodenectomy (OPD). A randomized clinical trial would be the best tool, albeit difficult and costly. To attempt to mitigate this, we have performed a meta-analysis on the latest literature.

Methods/Research Design.

A systematic literature search was conducted on PubMed, Embase, and Cochrane Central databases from January 2015 to May 2024. Articles comparing outcomes between RPD and OPD, exclusively in pancreatic cancer patients, were examined for inclusion. Non-comparative studies and studies without propensity-score matching were excluded. Primary endpoints were operative time, blood loss, overall complication rate, mortality rate, and length of stay, whereas secondary endpoints included R0 resection rate, lymph nodes harvested, pancreatic fistula rate, delayed gastric emptying rate, and infection rate. A random effects model meta-analysis was conducted. The I2 statistic was used to assess heterogeneity.

Results (or Preliminary Results, as applicable for a project in progress):

13 propensity-score matched studies were identified, including 2478 patients (938 in the RPD group and 1540 in the OPD group). The RPD group was associated with longer operative times (Weighted Mean Difference: 42.05 min; 95% CI, 9.03 to 75.08; $p = 0.013$), less blood loss (WMD: -165.09 mL; 95% CI: -254.04 to -76.13; $p < 0.001$), fewer overall complications (Odds Ratio: 0.57; 95% CI: 0.38 to 0.86; $p = 0.007$), decreased length of stay (WMD: -1.72; 95% CI: -2.65 to -0.79; $p = < 0.001$) and decreased perioperative mortality (OR: 0.62; 95% CI: 0.39 to 1.00; $p = 0.048$). Lymph node yield was increased in RPD (WMD: 1.42 nodes; 95% CI: 0.11 to 2.73; $p = 0.034$). There were no statistically significant differences in terms of postoperative hemorrhage and major complications. There was a trend on bile leak, delayed gastric emptying, R0 resection and pancreatic fistulas favoring RPD.

Conclusion (or Preliminary Conclusion, as applicable for a project in progress):

Although there is lack of level 1 data, our review and meta-analysis of the latest literature suggest that RPD for pancreatic cancer is taking longer, but has less intraoperative blood loss and less postoperative complications, translating into a decreased length of stay, as compared to OPD. A well designed multicenter clinical trial would clarify further the strengths of each type of surgery, to better serve patients with pancreatic cancer.