COMPARISON OF REDUCED-PORT TOTALLY ROBOTIC PANCREATICODUODENECTOMY WITH CONVENTIONAL TOTALLY ROBOTIC AND LAPAROSCOPIC PANCREATICODUODENECTOMY

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Background : Reduced-port totally robotic pancreaticoduodenectomy (rpRPD) is a novel minimally invasive surgical method introduced to overcome limitations of conventional robotic pancreaticoduodenectomy (cRPD). This study, the first to report on rpRPD, evaluates its clinical outcomes, perioperative parameters, and learning curve compared with cRPD and laparoscopic pancreaticoduodenectomy (LPD).

Methods : A retrospective cohort study was conducted, including patients who underwent pancreaticoduodenectomy between January 2015 and December 2024. Patients were categorized into rpRPD (n=40), cRPD (n=60), and LPD (n=262) groups. Learning curves were assessed using cumulative sum analysis and regression models, focusing on key metrics such as operative time, blood loss, and stabilization points.

Results : Baseline characteristics were similar across groups. rpRPD demonstrated a shorter operative time ($p < 0.001$) and reduced blood loss ($p < 0.05$) compared to cRPD. Postoperative complications and hospital stay showed no significant differences among groups. Learning curve analysis revealed that rpRPD provided smoother and more consistent improvements over time compared to cRPD, highlighting its greater predictability (variance: rpRPD 5839.3 vs cRPD 8919.1) and procedural stability during the learning phase.

Conclusions : rpRPD provides comparable clinical outcomes to cRPD and LPD while enhancing procedural consistency and reducing operative time and blood loss. Its favorable learning curve and reduced variability highlight rpRPD as a safe and efficient alternative for minimally invasive pancreatic surgery. Further studies are warranted to confirm long-term oncological benefits.

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