

# Robotic Versus Laparoscopic Surgery For Spleen-Preserving Distal Pancreatectomies: Systematic Review And Meta-Analysis

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**Background :** The decision on preserving the spleen when performing a distal pancreatectomy (DP) is usually based on the balance between achieving an adequate oncological clearance and avoiding complications related to asplenia. This systematic review and meta-analysis aims to summarize all of the available evidence regarding spleen-preserving DP and compare results and outcomes of minimally invasive robotic DP (SP-RADP) and laparoscopic DP (SP-LADP) techniques.

**Methods :** A systematic search of MEDLINE, Embase, and Web Of Science identified 11 studies reporting outcomes of 323 patients undergoing intended SP-RADP and 362 SP-LADP in order to compare the spleen preservation rates of the two techniques. The risk of bias was evaluated according to the Newcastle-Ottawa Scale. The primary outcome was the spleen preservation failure rate. Secondary outcomes included intraoperative blood loss, operative time, prevalence of clinically relevant POPF (grade B/C), prevalence of postoperative complications (Clavien-Dindo grades  $\geq 3$ ), hospital LOS, and mortality.

**Results :** The risk difference (RD) of spleen preservation failures was 0.24 (95% CI 0.15, 0.33), favoring the robotic approach and with moderate heterogeneity ( $I^2 = 63\%$ ). The Kimura technique was adopted in 159 out of the 196 patients (81.1%) undergoing SP-RADP (the remaining 18.9% of patients had the pancreatic resection performed according to the technique described by Warshaw) and in 84 out of the 154 SP-LADP (54.5%). The "open" conversion rate RD was -0.05 (95% CI -0.09, -0.01), favoring the robotic approach. The intraoperative blood loss was significantly lower for the robotic group, with a mean difference of -138 mL (95% CI -205, -71) and high heterogeneity ( $I^2 = 97\%$ ). There was no statistical difference in the operative time between the two groups, with a mean difference of 6.1 min (95% CI -40, 52) and high heterogeneity ( $I^2 = 97\%$ ). The RD of clinically relevant POPF (ISGPS grade B/C) was 0.00 (95% CI -0.06, 0.07) with no heterogeneity ( $I^2 = 0\%$ ). The RD of Clavien-Dindo grade  $\geq 3$  postoperative complications was -0.04 (95% CI -0.11, 0.03) with no heterogeneity ( $I^2 = 0\%$ ). The mean hospital LOS difference was -1.5 days (95% CI -2.8, -0.2) in favor of SP-RADP. No cases of 30-day deaths were reported.

**Conclusions :** Both SP-RADP and SP-LADP proved to be safe and effective procedures, with minimal perioperative mortality and low postoperative morbidity. The robotic approach proved to be superior to the laparoscopic approach in terms of spleen preservation rate, intraoperative blood loss, and hospital length of stay.

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