

Surgical Options in the Treatment of Rectal Cancer: A Systematic Review and Meta-Analysis

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Abstract

Background: Rectal surgery has evolved through the combined efforts of anatomists and surgeons. Minimally invasive surgery has gained recognition over open surgery due to fewer perioperative complications, and faster postoperative recovery.

Methods: A systematic search was conducted in PubMed, Scopus, and Web of Science to identify studies published between 2014 and December 2024 comparing laparoscopic surgery (LS) and open surgery (OS) for rectal cancer. Primary outcomes included postoperative complications, number of lymph nodes harvested, overall survival, and disease-free survival.

Results: Eight randomized controlled trials and one non-randomized study, including a total of 3,935 patients, were analyzed. LS showed a lower incidence of postoperative complications [OR: 0.64; 95% CI, 0.53, 0.77; p=0.008] and a slight advantage in lymph node harvest (WMD: 0.66; 95% CI: -0.63–1.95). No significant differences were found in overall or disease-free survival.

Conclusions: LS is a safe and effective option for rectal cancer treatment, offering better postoperative recovery and efficient lymph node retrieval, while maintaining long-term oncological outcomes comparable to OS.

Keywords: laparoscopic surgery, rectal cancer, minimally invasive surgery, open surgery