

Impact of laparoscopic and open surgery on stoma formation and postoperative outcomes in elderly patients with obstructive colorectal cancer following self-expandable metallic stent placement: a systematic review and meta-analysis

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ABSTRACT

Short Abstract

Background: Optimal surgical approach after SEMS for obstructive CRC in the elderly is uncertain.
Methods: PRISMA/Cochrane systematic review and random-effects meta-analysis of **observational** studies comparing **laparoscopic (LS)** vs **open surgery (OpS)** in patients ≥ 65 y after SEMS; outcomes included leak, ileus, mortality, complications, anastomosis, **stoma**, and wound infection; NOS for quality; fixed-effects sensitivity.
Results: **7 studies; n = 326**. No significant differences for leak (OR 0.65), ileus (0.69), mortality (0.97), overall complications (0.58), anastomosis (0.65), or wound infection (0.60); **heterogeneity low-moderate. Stoma formation was significantly lower with LS** (OR 0.08; $I^2 = 0\%$). Sensitivity analyses did not change conclusions.
Conclusions: In elderly obstructive CRC patients bridged with SEMS, **LS is as safe as OpS and markedly reduces stoma construction**. Choice should consider frailty, tumor factors, and local expertise; future studies should assess long-term, functional, and patient-reported outcomes.

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INTRODUCTION

Elderly patients (≥ 65 y) with obstructive colorectal cancer (CRC) often receive self-expandable metallic stents (SEMS) as a bridge to surgery. Whether **laparoscopy (LS)** or **open surgery (OpS)** offers better outcomes after SEMS in this age group is unclear, as prior work mixes ages and designs. We synthesized evidence **focused on older adults**.

METHODS AND MATERIALS

PRISMA/Cochrane systematic review of comparative **observational** studies of **LS vs OpS** after SEMS in patients ≥ 65 y with obstructive CRC. Outcomes: anastomotic leak, ileus, mortality, overall postoperative complications, anastomosis rates, **stoma construction**, wound infection. Random-effects Mantel-Haenszel models; ORs with 95% CIs; I^2 for heterogeneity. Sensitivity analysis: **fixed-effects**. Study quality: **Newcastle-Ottawa Scale**

RESULTS

7 studies; n = 326 (LS = 166; OpS = 160). Quality generally high (NOS 7–9/9).
 • **Anastomotic leak:** OR 0.65 (95% CI 0.18–2.28), $I^2 = 0\%$, $P = 0.50 \rightarrow$ NS
 • **Ileus:** OR 0.69 (0.13–3.55), $I^2 = 29\%$, $P = 0.65 \rightarrow$ NS
 • **Mortality (30-day):** OR 0.97 (0.33–2.82), $I^2 = 0\%$, $P = 0.95 \rightarrow$ NS
 • **Overall complications:** OR 0.58 (0.29–1.13), $I^2 = 23\%$, $P = 0.11 \rightarrow$ NS (trend to fewer with LS)
 • **Anastomosis achieved:** OR 0.65 (0.18–2.28), $I^2 = 0\%$, $P = 0.50 \rightarrow$ NS
 • **Stoma construction:** **OR 0.08 (0.01–0.64)**, $I^2 = 0\%$, $P = 0.02 \rightarrow$ significantly fewer stomas with LS (2 studies; n = 137)
 • **Wound infection:** OR 0.60 (0.21–1.72), $I^2 = 0\%$, $P = 0.35 \rightarrow$ NS
 • **Sensitivity (fixed-effects):** conclusions **unchanged** across outcomes.

Clinical implications

• **Stoma avoidance matters in geriatrics:** LS after SEMS **substantially reduces stoma formation** versus OpS. Given the impact of stomas on hydration, skin integrity, caregiver burden, and quality of life in older adults, this is clinically meaningful even when other endpoints are similar.
 • **Comparable safety:** Short-term safety signals (leak, ileus, mortality, wound infection) are **similar** between LS and OpS, supporting LS as an appropriate default when expertise is available.
 • **Pathway design:** For centers using SEMS-as-bridge pathways, adopting **LS-first** protocols can reduce stoma rates without compromising early outcomes—useful for ERAS programs and bed-flow planning.
 • **Patient selection:** Individualize by **frailty/comorbidities**, tumor stage/site, and anticipated adhesions. Where LS expertise or resources are limited, OpS remains reasonable; however, **referral to laparoscopic teams** may benefit patients at high risk of stoma-related morbidity.
 • **Counseling:** Discuss with patients that overall risks are similar, but **LS offers a higher chance of avoiding a stoma**; align with patient preferences and social support.

DISCUSSION

Across seven observational studies in older adults after SEMS, **LS and OpS deliver broadly comparable short-term outcomes**, with a **clear reduction in stoma construction** for LS. Evidence is limited by study design (mostly retrospective), modest sample sizes, and lack of standardized long-term and patient-reported outcomes.

CONCLUSIONS

Until randomized or large propensity-balanced studies confirm long-term advantages, **LS should be considered the preferred approach** where feasible, with decisions individualized to patient and institutional factors.