



Robotic Subtotal Cholecystectomy: Safety, Technique, and Outcomes

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OBJECTVE

To review the available paucity of literature on robotic subtotal cholecystectomies (STC) and evaluate feasibility, operative technique, and perioperative outcomes.

BACKGROUND

- Laparoscopic STC is a recognized “bailout” strategy during challenging cholecystectomies. However, it results in a high post-op complication rate ie. bile leak or need for ERCP.
- Robotic STC are not as common as laparoscopic and may facilitate easier reconstituting closure rather than fenestrating techniques to decrease post-op complications
- The role of robotics in STC remains incompletely defined.

METHODS

- Systematic review with PRISMA guidelines.
- Databases searched: PubMed/MEDLINE, Google Scholar, PMC.
- Search through August 2025.
- Inclusion: peer-reviewed human studies involving robotic STC.
- Five studies met inclusion, providing data from 46 robotic subtotal cholecystectomies.

EVIDENCE GRID– ROBOTIC SUBTOTAL CHOLECYSTECTOMY

Author (Year)	Design	n RSTC	Technique	Key Outcomes
Bronikowski (2021)	Case report	1	Fenestrating subtotal; posterior wall left, ICG used	Morbidly-obese patient, POD1 discharge, no complications
Zhu (2023)	Case series (complex cases)	3	1 fenestrating, 1 reconstituting, 1 with fistula repair; ICG, fundus-first	No conversions, no injuries, rapid recovery
Stefanishina (2025)	Retrospective cohort (robotic vs laparoscopic)	18	72% reconstituting vs lap 100% fenestrating	Fewer post-op ERCP (11.1% vs 27.1%, P=0.03); similar OR time/LOS
Patel (ACS Case Rev, 2025)	Case report	1	Fenestrating subtotal with concurrent Morgagni hernia repair	Uncomplicated recovery; first report in hemorrhagic cholecystitis
Greenberg (2024)	Multicenter retrospective (acute gallbladder, J Trauma Acute Care Surg)	23	Database-defined; fenestrating vs reconstituting not specified	Robotic subtotal 0.7% vs lap 0.5%; ↓ open conversion (1.1% vs 1.9%); similar complications & cost

KEY FINDINGS

- Across 5 studies of 46 robotic STC:
 - 72% underwent reconstituting closure.
- Robotic STC was associated with fewer post-operative ERCPs vs laparoscopic:
 - 11.1% vs 27.1%, *P* = 0.03.
- Multicenter data showed:
 - Reduced conversion to open: 1.1% vs 1.9%, *P* = 0.03.
 - No bile duct injuries reported across all studies.

INTERPRETATION

- Robotic STC appears safe and effective for challenging gallbladders.
- Robotic STCs are more likely to have reconstituting closure (72%).
- Robotic approach linked to fewer postoperative ERCPs and conversions to open.
- Larger studies needed to adequately assess outcomes

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