The Impact of Comorbidities and Surgical Approach in Incisional Hernia Development After Minimally Invasive Cholecystectomy: A Systematic Review and Meta-Analysis

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Introduction

Minimally Invasive Benefits of Laparoscopic Cholecystectomy

Laparoscopic cholecystectomy is favored for its reduced postoperative pain and faster recovery compared to traditional surgery.

Risk of Incisional Hernia

Despite its advantages, incisional hernia remains a notable complication after laparoscopic cholecystectomy.

Impact of Comorbidities on Hernia Risk

This systematic review and meta-analysis assess how comorbidities influence the likelihood of incisional hernia post-surgery.

Methods

- We searched Cochrane, Scopus, Embase, and PubMed for studies on Risk Factors for IH after MIS cholecystectomy.
- Outcomes included age, diabetes mellitus, BMI >30, sex, and history of umbilical hernia repair.
- Subgroups explored were single-incision MIS cholecystectomy (SILC) and multi-port MIS cholecystectomy (MPLC)

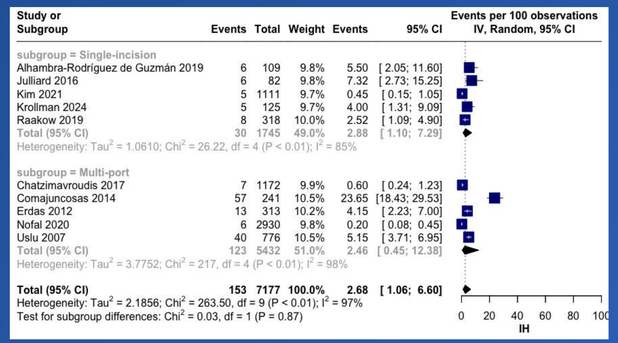
7,177 patients undergoing MIS cholecystectomy (Almost all laparoscopic)

- 10 studies included
- All cohort studies
- 90% multivariate regression-controlled

551 studies screened

MAIN FINDINGS

✓ **Pooled IH analysis (SILC versus MPLC):**



Risk factors for IH

✓ **Older age**

(MD 8.2 years [2.1-14.4]; p=0.008)

✓ **DM**

(RR 2.1 [1.1-4.2]; p=0.02)

✓ **BMI > 30kg/m²**

(RR 2.5 [1.9-3.2]; p<0.001)

No association between **sex** (RR 1.09; 95% CI [0.95; 1.26]; P = 0.68) and **previous umbilical hernia repair** (RR 2.12; 95% CI [0.86; 5.22]; p = 0.1) with increased IH **rates.**

Conclusion

- Older age, BMI > 30kg/m², and DM are risk factors linked to IH following MIS cholecystectomy.

References

1. Hendolin HI, et al. Laparoscopic vs Open Cholecystectomy: A Randomized Trial. Eur J Surg. 2000;166(5):394-399. [DOI](https://doi.org/10.3109/110241500750008961)

2. Gadacz TR, Talamini MA. Traditional vs Laparoscopic Cholecystectomy. Am J Surg. 1991;161(3):336-338. [DOI](https://doi.org/10.1016/0002-9610(91)90591-Z)

3. Coccolini F, et al. Open vs Laparoscopic Cholecystectomy in Acute Cholecystitis: A Meta-analysis. Int J Surg. 2015;18:196-204. [DOI](https://doi.org/10.1016/j.ijsu.2015.04.083)

4. Sanz-López R, et al. Incisional Hernias After Laparoscopic vs Open Cholecystectomy. Surg Endosc. 1999;13:922-924. [DOI](https://doi.org/10.1007/s004649901135)

5. van Ramshorst GH, et al. Impact of Incisional Hernia on Quality of Life. Am J Surg. 2012;204(2):144-150. [DOI](https://doi.org/10.1016/j.amjsurg.2012.01.012)

6. Delgado GEM, Santiago MLA. Review of Incisional Hernias. Int Surg J. 2023;10:810-813. [Link](https://www.ijsurgery.com/index.php/isj/article/view/9580/5696)

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