

Indocyanine Green Versus Conventional Assessment for Leak Prevention in Bariatric Surgery: A Systematic Review and Meta-Analysis

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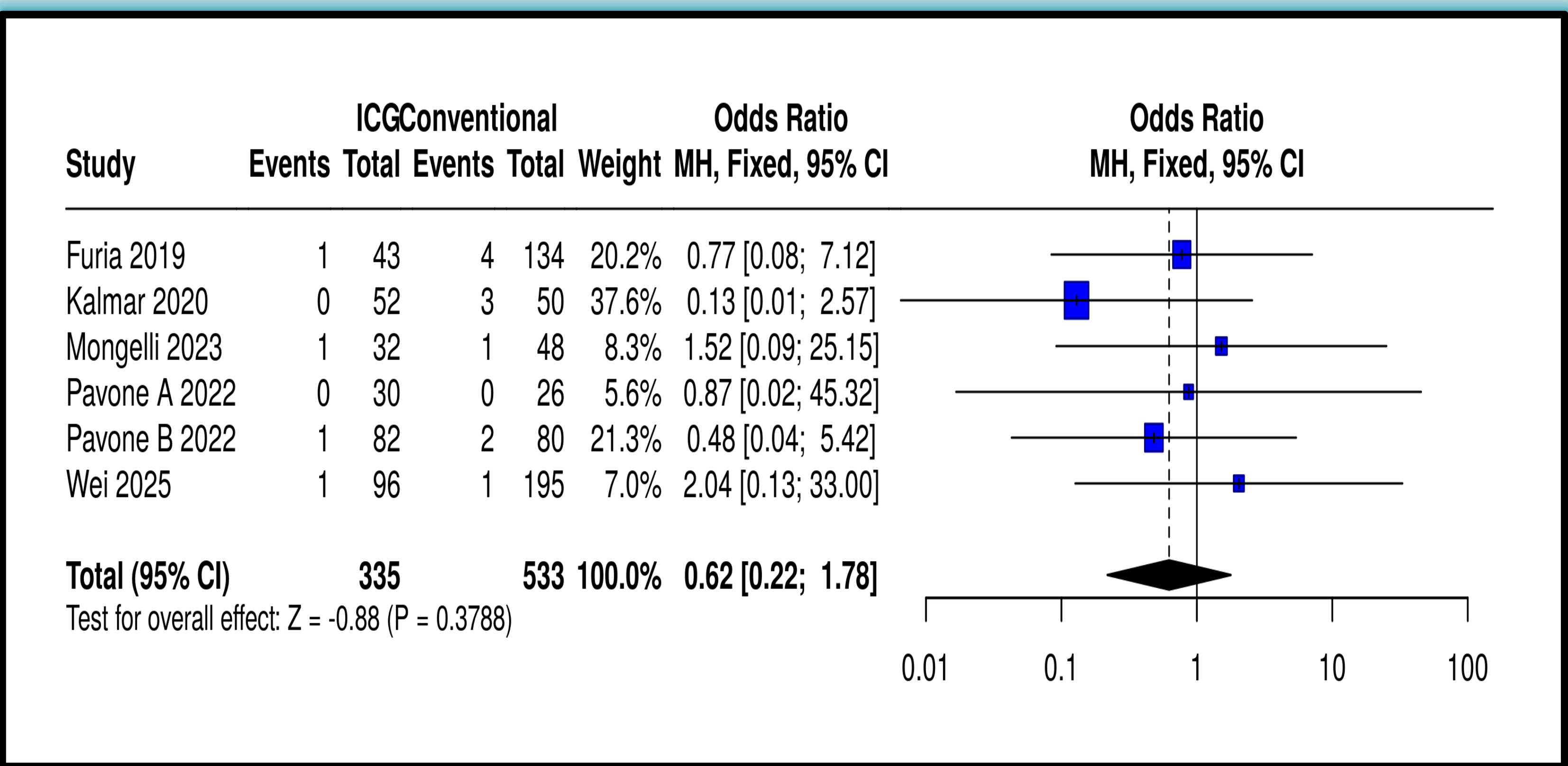
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INTRODUCTION

- Staple-line or anastomotic leaks after bariatric surgery are uncommon but severe postoperative complications leading to sepsis, prolonged hospitalization, reoperation, and mortality
- Indocyanine green (ICG) fluorescence imaging offers real-time assessment of tissue perfusion and has been proposed to detect leaks compared to conventional assessment
- High-quality comparative evidence on the effectiveness of ICG versus conventional methods is lacking
- This study aims to systematically review and meta-analyze comparative cohorts to evaluate ICG versus conventional assessment for leak prevention in bariatric surgery.

Figure 1 and Graphical Abstract

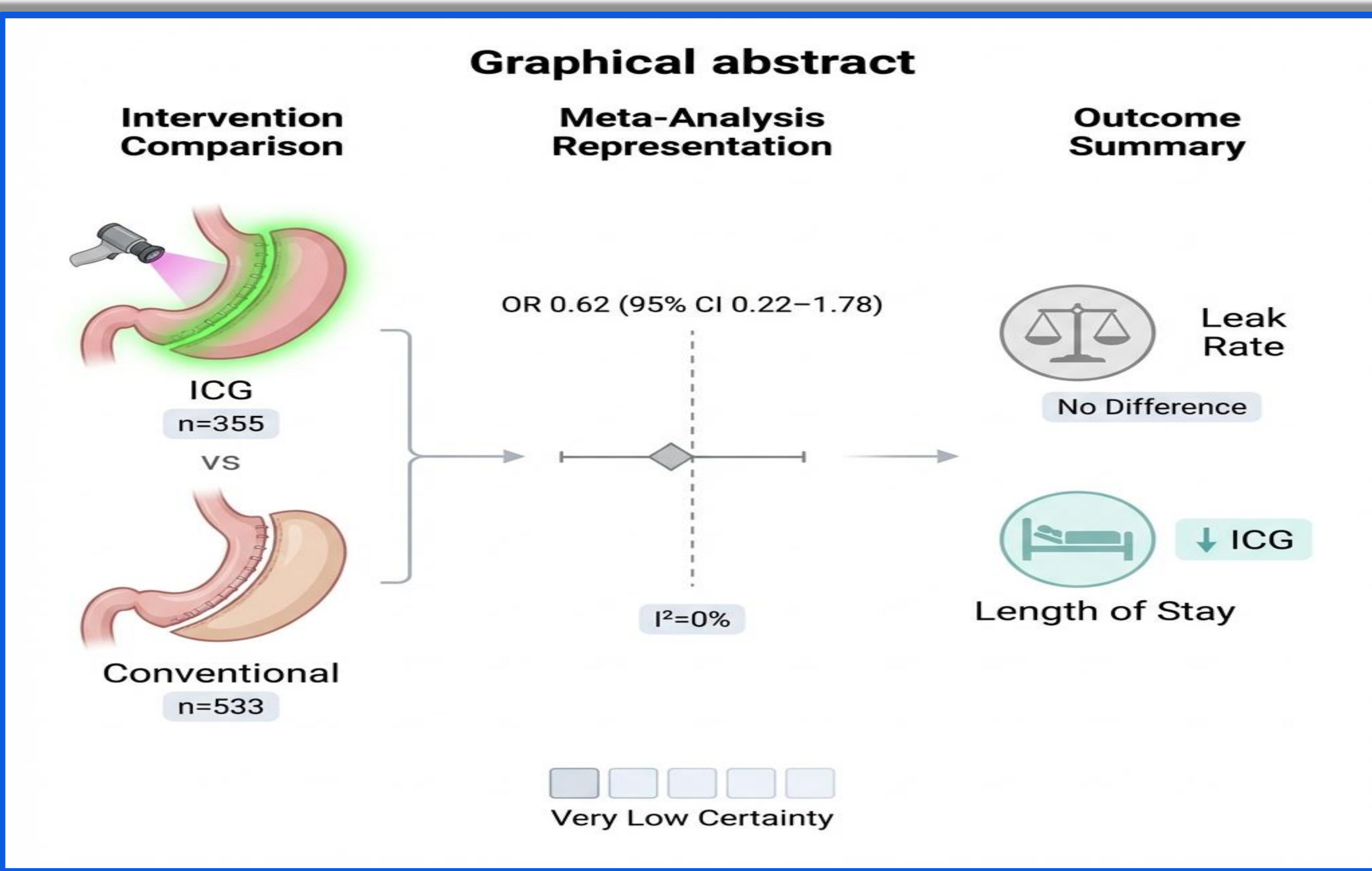


RESULTS

- Six cohorts comprising 888 patients were included, with 355 patients assessed using ICG and 533 using conventional methods
- ICG assessment did not significantly reduce leak rates compared to conventional methods (OR= 0.62, 95% CI= 0.22 to 1.78, $I^2 = 0\%$, P=0.37) (Figure 1).
- Secondary outcomes including reoperation, bleeding, operative time, and mortality showed no meaningful differences between groups
- Length of hospital stay was significantly shorter in the ICG group compared to conventional methods
- Risk of bias was moderate in five studies and serious in one study
- Certainty of evidence was very low due to observational design, serious risk of bias, small sample size, and extreme imprecision.

METHDOS

- Conducted a PRISMA-compliant systematic review and meta-analysis of comparative cohorts published after 2019
- Included adult patients undergoing bariatric surgery comparing ICG versus conventional assessment for leak prevention
- Primary endpoint was 30-day leak rate; secondary endpoints included reoperation, bleeding, operative time, length of stay, and mortality
- Risk of bias assessed using ROBINS-I tool
- Certainty of evidence evaluated with GRADE methodology



CONCLUSION

- Evidence does not currently support a definitive benefit of ICG over conventional methods for leak detection in bariatric surgery
- Observational study designs, rare events, and small sample sizes limit confidence in findings
- Larger, well-designed trials are necessary to clarify the role of ICG
- Heterogeneity in ICG application techniques should be standardized in future research

Acknowledgements: None.

Conflict of Interest: The authors ENR, ASD, AFR, and RY declare that they have no conflict of interest to disclose.

Ethics Statement: Ethical approval was not required for this systematic review.

Funding: No funding was received for this study.