



LAPAROSCOPIC VS OPEN APPENDICECTOMY IN OBESE INDIAN PATIENTS: A 75-PATIENT PROSPECTIVE STUDY

General Surgery

Dr. Mahendra Kumar Meena

Assistant Professor, Mahatma Gandhi Medical College, Jaipur

Dr. Paresh Sharma*

Junior Resident, Mahatma Gandhi Medical College, Jaipur *Corresponding Author

Dr. Sanchita Kharoliwal

Junior Resident, Mahatma Gandhi Medical College, Jaipur

ABSTRACT

Background: Appendicitis is a common surgical emergency in India. In obese patients, defined by Indian consensus as having a BMI ≥ 25 kg/m², the choice between laparoscopic appendectomy (LA) and open appendectomy (OA) significantly affects postoperative outcomes. This study evaluates and compares the efficacy and safety of LA versus OA in obese Indian patients. **Methods:** A prospective observational study was conducted on 75 obese patients diagnosed with acute appendicitis at a tertiary care hospital. Patients were divided into two groups: LA (n=38) and OA (n=37). Clinical parameters including operative time, postoperative pain, time to oral intake, hospital stay, wound complications, and cosmetic satisfaction were assessed. Statistical analysis was performed using SPSS v25. **Results:** While operative time was marginally longer in LA (60 $\pm$ 12 min vs 52 $\pm$ 11 min; p=0.02), patients in the LA group had significantly earlier oral intake (9 $\pm$ 3 hrs vs 17 $\pm$ 4 hrs), shorter hospital stays (2.2 $\pm$ 0.7 vs 3.5 $\pm$ 1.0 days), and lower 24-hour pain scores (3.4 $\pm$ 1.2 vs 5.8 $\pm$ 1.5; p<0.001). Wound infections were significantly lower in LA (2.6% vs 18.9%; p=0.03), and cosmetic satisfaction was notably higher. **Conclusion:** Laparoscopic appendectomy offers superior postoperative outcomes in obese Indian patients and should be preferred over the open approach, despite a slightly increased operative time.

KEYWORDS

Laparoscopic appendectomy, Open appendectomy, Obesity, BMI ≥ 25 kg/m², Indian population, Postoperative outcomes, Wound infection, Minimally invasive surgery, Hospital stay, Abdominal

INTRODUCTION

Appendicitis remains one of the most common surgical emergencies worldwide, with appendectomy being the definitive treatment. Traditionally performed via an open approach, the procedure has evolved significantly with the advent of minimally invasive surgery. Laparoscopic appendectomy (LA) has gained prominence due to its advantages such as reduced postoperative pain, shorter hospital stay, faster recovery, and better cosmetic outcomes.

Obesity, defined by the World Health Organization (WHO) as a body mass index (BMI) ≥ 30 kg/m², presents unique challenges in general surgery. Obese patients undergoing abdominal procedures are at higher risk for postoperative complications, including wound infection, delayed healing, increased operative time, and higher conversion rates. With the global rise in obesity, evaluating the best surgical approach for this population has become critical.

Laparoscopy, by virtue of smaller incisions and reduced tissue handling, is hypothesized to be more beneficial in obese patients. However, increased abdominal wall thickness, technical difficulty, and prolonged operative time may offset its advantages. Conversely, open appendectomy (OA) may be faster but is associated with a higher risk of wound-related complications in obese individuals.

While multiple international studies have explored the efficacy of LA versus OA, data specifically focused on obese populations remain limited, particularly in resource-constrained settings like India. Moreover, Indian patient characteristics and surgical setup may influence outcomes.

This study aims to compare the clinical outcomes of laparoscopic and open appendectomy in obese patients, including operative time, complication rates, postoperative recovery, and hospital stay, and to contextualize our findings with existing literature.

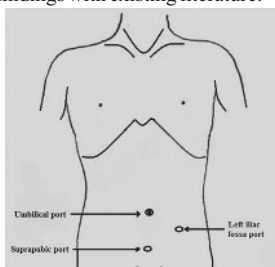


Figure 1: Ports placement in Laparoscopic Appendectomy

Aims And Objectives

Aim:

To compare outcomes of laparoscopic versus open appendectomy in obese Indian patients (BMI ≥ 25 kg/m²).

Objectives:

1. Compare operative time
2. Evaluate postoperative complications (wound infection, abscess)
3. Measure postoperative pain (24 h VAS), time to oral intake, and hospital stay
4. Assess cosmetic satisfaction
5. Review findings against available Indian and global data

Materials And Methodology

Study Design: Prospective observational study over 18 months in a tertiary-care centre in India.

Sample Size: 75 obese patients (BMI ≥ 25 kg/m² per Indian criteria), 18–60 years, with acute appendicitis.

Groups:

- **Group A (LA):** 38 patients
- **Group B (OA):** 37 patients

Inclusion Criteria: Indian adults (18–60 yrs) with BMI ≥ 25 kg/m², confirmed on clinical & USG/CT.

Exclusion Criteria: Generalized peritonitis, appendicular abscess, previous laparotomy, ASA $\geq$ III.

BMI Classification – Indian Norms: Overweight: 23–24.9 kg/m²; Obese: ≥ 25 kg/m²

Surgical Technique: LA used a standard 3-port method (10/5/5 mm) by experienced laparoscopic surgeons; OA used gridiron/Lanz incision.

Evaluated Parameters: Age, gender, BMI, operative time, intraoperative complications, 24 h VAS, time to oral intake, hospital stay, wound infection, abscess, cosmetic satisfaction, 30-day follow-up.

Statistics: Analysis via SPSS v25; t-tests for continuous data.

Chi-square for categorical variables; p < 0.05 significant.

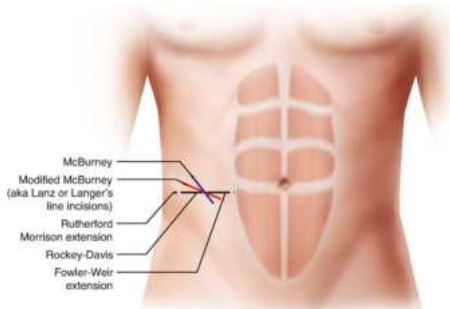


Figure 2 : Incisions used in Open Appendectomy

RESULTS

Demographics: No significant difference in mean age or BMI (mean BMI: LA 27.6 ± 2.1, OA 27.9 ± 2.4).

Key Findings: Though operative times were modestly longer in LA, the benefits—earlier feeding, less pain, shorter stay, lower infection rates, and better cosmesis—were statistically and clinically significant.

Parameter	LA (n=38)	OA (n=37)	p-value
Operative time (min)	60 ± 12	52 ± 11	0.02
Time to oral intake (hrs)	9 ± 3	17 ± 4	<0.001
Hospital stay (days)	2.2 ± 0.7	3.5 ± 1.0	<0.001
VAS pain score (24h)	3.4 ± 1.2	5.8 ± 1.5	<0.001
Wound infection	1 (2.6%)	7 (18.9%)	0.03
Intra-abdominal abscess	0	1 (2.7%)	NS
Cosmetic satisfaction (good)	33 (86.8%)	16 (43.2%)	<0.001

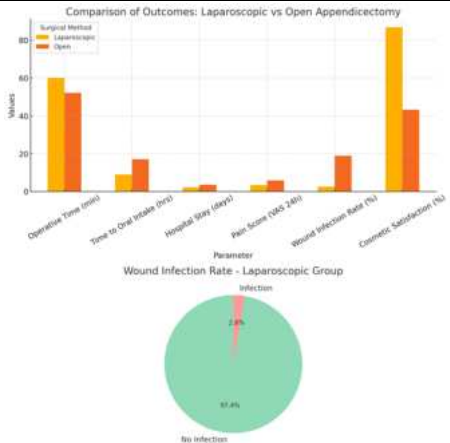


Figure 3 : Comparison Of Results

Discussion & Literature Review

- Obesity Criteria:** Our use of BMI ≥25 aligns with Indian consensus guidelines .
- Operative Time:** Indian cohort studies reported longer operative times for LA (~45–77 min) versus OA (~52–68 min) ; our results fall within this range.
- Postoperative Recovery:** Early feeding (≈9 h) and shorter hospital stays in LA mirror Indian and Egyptian studies with similar parameters .
- Pain & Infections:** Significant reductions in 24 h pain scores and wound infection (2.6% vs ~19%) align with Turkish and Alexandria studies .
- Global Data:** International meta-analyses (e.g., Masoomi et al. in NSQIP, early studies like Clarke et al.) emphasize LA's lower morbidity in obese patients .
- Limitations:** Single-center design, modest sample size, and no long-term outcomes (e.g., incisional hernia).

CONCLUSION

In obese Indian patients (BMI ≥25kg/m²), laparoscopic

appendectomy significantly improves peri- and postoperative outcomes over the open approach: decreased postoperative pain, earlier recovery, shorter hospital stay, fewer wound infections, and superior cosmetic outcomes. While operative time is marginally longer, the advantages substantiate LA as the preferred modality in obese Indians.

Recommendation: Adopt LA as standard for obese patients in Indian practice. Future multicenter RCTs with broader sample sizes and long-term follow-up are essential to validate these findings and assess cost-effectiveness and quality of life.

REFERENCES:

- 1) Laparoscopic versus Open Appendectomy: A Prospective Comparative Study and 4-Year Experience in a Tertiary Care Hospital Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Port-position-in-laparoscopic-appendectomy_fig1_362851367 [accessed 24 Jun 2025]
- 2) Misra A, Chowbey P, Makkar BM, Vikram NK, Wasir JS, Chadha D, et al. Consensus Statement for Diagnosis of Obesity, Abdominal Obesity and the Metabolic Syndrome for Asian Indians and Recommendations for Physical Activity, Medical and Surgical Management. J Assoc Physicians India. 2009;57:163–70.
- 3) Guller U, Hervey S, Purves H, Muhlbaier LH, Peterson ED, Eubanks S, et al. Laparoscopic Versus Open Appendectomy: Outcomes Comparison Based on a Large Administrative Database. Ann Surg. 2004 Jan;239(1):43–52.
- 4) Masoomi H, Mills S, Dolich MO, Ketana N, Carmichael JC, Nguyen NT, et al. Comparison of outcomes of laparoscopic vs open appendectomy in obese patients: Data from the Nationwide Inpatient Sample (NIS), 2006–2008. Am Surg. 2011;77 (10): 1336–40.
- 5) Khalil J, Muqeem R, Farooq M, Ahmed B, Khan AM, Jamal A. Laparoscopic versus open appendectomy in obese patients: a randomized controlled trial. Egypt J Surg. 2022;41(1):32–6.