



## INCIDENCE AND RISK FACTORS OF PORT SITE INFECTIONS FOLLOWING LAPAROSCOPIC SURGERIES: A PROSPECTIVE OBSERVATIONAL STUDY

### Surgery

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### ABSTRACT

**Background:** Port site infections (PSIs) are uncommon but significant postoperative complications of laparoscopic surgeries, potentially undermining the benefits of minimally invasive procedures. This prospective study aimed to determine the incidence, microbial profile, and associated risk factors of PSIs in patients undergoing laparoscopic surgeries at a tertiary care hospital in Western Rajasthan. **Methods:** A prospective observational study was conducted between January 2024 and May 2025 on 354 patients who underwent elective and emergency laparoscopic procedures. Demographic details, comorbidities, type of surgery, port size, port site, and microbiological findings were analyzed. Statistical tests were applied to assess associations between risk factors and PSIs. **Results:** The overall incidence of PSIs was 3.38%. Infections were more common in males (4.28%) than females (2.40%) and significantly higher in emergency surgeries (11.11%) than in elective cases (1.42%). Supra-umbilical ports (50%) were the most affected sites. *Staphylococcus aureus* was the predominant organism (41.67%), followed by *Streptococcus* (25%). **Conclusion:** Larger port sizes ( $\geq 10$  mm), emergency surgeries, and umbilical sites were major risk factors for PSIs. Implementation of stringent aseptic measures, appropriate antibiotic prophylaxis, and improved sterilization techniques is essential to minimize infection rates.

### KEYWORDS

Port site infection, Laparoscopic surgery, *Staphylococcus aureus*, Risk factors, Sterilization protocols

### INTRODUCTION

Laparoscopic surgery has revolutionized modern surgical practice by reducing postoperative pain, hospital stay, and improving cosmetic outcomes. However, the occurrence of port site infections (PSIs) remains a concerning postoperative complication. Although the reported incidence of PSIs ranges from 1.4% to 6.7%, they can significantly impact recovery and patient satisfaction.

The etiology of PSIs is multifactorial, involving patient-related factors such as age, comorbidities, and hygiene; and surgical factors such as port size, number of ports, type of surgery, and sterilization method. The most commonly implicated organisms include *Staphylococcus aureus*, *Streptococcus* species, and *Pseudomonas aeruginosa*. This study aims to evaluate the proportion, risk factors, and microbial distribution of PSIs in a tertiary care setting.

### MATERIALS AND METHODS

A prospective observational study was conducted in the Department of Surgery, S.N. Medical College, Jodhpur, from January 2024 to May 2025. All patients aged  $>10$  years undergoing elective or emergency laparoscopic surgeries were included. Patients converted to open surgery, pregnant women, and known cases of malignancy were excluded.

Data were collected on patient demographics, type of procedure, port characteristics, comorbidities, and postoperative outcomes. Port site infections were diagnosed clinically and confirmed microbiologically via culture and sensitivity testing. Statistical analysis was performed to determine correlations between various parameters and PSIs, with a  $p$ -value  $<0.05$  considered significant.

### RESULTS

### DISCUSSION

The present study found a PSI incidence of 3.38%, consistent with previous literature reporting infection rates between 1.4% and 6.7%. A higher infection rate was observed among males and in emergency surgeries, indicating that patient condition and surgical urgency contribute significantly to infection risk.

*Staphylococcus aureus* was the most common organism isolated, followed by *Streptococcus* and *Pseudomonas* species. This is in agreement with studies by Karthik et al.<sup>1</sup> and Mir et al.<sup>2</sup>, who also reported *Staphylococcus aureus* as the predominant pathogen. The predominance of umbilical site involvement (50%) corresponds to its frequent use for specimen retrieval and proximity to native skin flora. The infection rate was highest in laparoscopic appendectomy (6.6%), likely due to contamination from inflamed or perforated appendices.

Emergency cases demonstrated an 11.11% PSI rate, much higher than elective procedures (1.42%), aligning with findings by Triantafyllidis et al.<sup>3</sup>.

Preventive measures must focus on proper instrument sterilization, especially for non-autoclavable laparoscopic tools. Routine use of specimen retrieval bags, adequate port site irrigation, and adherence to aseptic principles are recommended.

### CONCLUSION

Port site infections, though relatively uncommon, can significantly affect postoperative recovery and patient satisfaction. The study identified emergency surgery, large port size, and umbilical location as major risk factors. Adherence to sterilization protocols, judicious antibiotic prophylaxis, and meticulous surgical technique are essential for minimizing infection risks.

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