

A Clinical Study on Port Site Complications in Laparoscopic Surgery**Jyotirmaya Nayak¹, Nagendra Kumar Rajsamant², Sridhar Panda³,
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Conflict of interest: Nil

Abstract:

Background: Laparoscopic procedures have enhanced the surgical profession and are more favourable than laparotomies in terms of decreasing patient morbidity, minimising hospital stays, and allowing patients to return to regular activities. Complications are determined by the extent of the portal site incision, the number of ports, obesity, and umbilical ports. Complications include abdominal access by laparoscopic trocars, vascular injuries, visceral injuries, air embolisms, subcutaneous emphysema, port site infections, portal site incisional hernias, and portal site metastases.

Aims of the Study: To study and identify the port site related complications in laparoscopic procedures and to determine the risk factors, foresee difficulties, and recommend prompt preventative actions.

Materials & Methods: A Prospective Observational study done in 50 patients undergoing Laparoscopic Surgery in the Department of Surgery, SCB Medical college and Hospital, Cuttack for a period of 12 months from May 2022 to April 2023.

Results and Conclusion: A prospective research was conducted to examine the morbidity at the port sites of laparoscopic surgeries (both basic and advanced), including elective and emergency procedures, as well as the risk factors for complications and their management. This research population consisted of 100 people and was conducted over a three-year period. The most prevalent LPSCs were discharge and infection, followed by bleeding, PSH, and metastases. These problems are more common in people who have the following factors: Hasson's approach of access or open, larger port size, older age group, higher BMI, specimen retrieval bag not utilised.

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Introduction

Laparoscopic procedures have enhanced the surgical profession and are more favourable than laparotomies in terms of decreasing patient morbidity, minimising hospital stays, and allowing patients to return to regular activities. [1] During laparoscopic surgery, reusable metallic or disposable plastic trocars are introduced via tiny incisions.

Laparoscopic surgery has become the standard of therapy for many surgical and gynaecological disorders since it provides better advantages and results. [2] The major reasons for preferring laparoscopic surgery over open surgery include better anaesthesia, less discomfort and scarring, earlier ambulation, and shorter hospital stays. LPSC are obtained in relation to or after surgery. Complications are determined by the extent of the portal site incision, the number of ports, obesity, and umbilical ports.

Complications include abdominal access by laparoscopic trocars, vascular injuries, visceral injuries, air embolisms, subcutaneous emphysema, port site infections, portal site incisional hernias, and portal site metastases. These are uncommon complications. [3] Approximately 1.4 out of every 1,000 laparoscopic procedures result in significant complications. [4]

The frequency of LPSC is around 21 per 100,000 procedures [5], and it has been shown that the size of the port site incisions and trocar rises correspondingly. The bulk of laparoscopic problems (0.06%), genitourinary surgeries (0.03%), vascular surgeries (0.01%), and omentum-associated complications (0.04%) [6] are connected to gastrointestinal operations. Port site infections (PSIs) and pyoderma gangrenous [7,8] portal site metastases after laparoscopic oncosurgery are two of the less prevalent complications. [9]

Aims of the Study: To study and identify the port site related complications in laparoscopic procedures and to determine the risk factors, foresee difficulties, and recommend prompt preventative actions.

Materials & Methods:

A Prospective Observational study done in 50 patients undergoing Laparoscopic Surgery in the Department of Surgery, SCB Medical college and

Hospital, Cuttack for a period of 12 months from May 2022 to April 2023. Patients' preoperative diagnosis, intra operative findings and post operative complications were analysed for the study. Laparoscopic to open converted cases were not included in the study. Microsoft Excel and statistical applications such as SPSS Ver. 13.0 were used to analyse the data.

Results

Table 1: Diagnosis of the cases

Diagnosis	No. of Patients
Acute Appendicitis	21
Cholelithiasis	54
Inguinal Hernia	9
Epigastric Hernia	4
Supra Umbilical Hernia	11
Umbilical Hernia	1

Table 2: Age distribution

Age	No. of Patients
15-30	38
31- 40	19
Above 40	43

Table 3: Sex distribution

Sex	No. of Patients
Male	47
Female	53

Table 4: Surgery and port site complications

Type of Surgery	No. of Patients
Lap Appendicectomy	12
Lap Cholecystectomy	26
Lap Hernioplasty	10

Table 5: Port site complications

Complications	No. of Patients
Port Site Infection	15
Subcutaneous Emphysema	2
Port Site Hernia	6
Discharge	17
Bleeding	6
Omental Prolapse	2

Table 6: Port site discharge with access technique, port size & bmi

Access Technique	No. of Patients
Closed	7 (41.18%)
Open	10 (58.82%)
Port Size	
Large	10 (62.5%)
Small	6 (37.5%)
BMI	
<25	7 (41.18%)
>25	10 (58.82%)

Table 7: Port site hernia with port size, BMI

Port Size	No. of Patients
Large	4 (66.67%)
Small	2 (33.33%)
BMI	
<25	2 (33.33%)
>25	4 (66.67%)

Table 8: Port site infection and port types, method of access

Port Type	No. of Patients
Epigastric Port	3 (20%)
Umbilical Port	12 (80%)

Table 9: Port site bleeding with access technique, BMI

Access Technique	No. of Patients
Closed	2 (33.33%)
Open	4 (66.67%)
BMI	
<25	1 (16.67%)
>25	5 (83.33%)

Table 10: Omental entrapment & subcutaneous emphysema with bmi

BMI	Omental Entrapment	Subcutaneous Emphysema
<25	0	0
>25	2 (100%)	2 (100%)

Discussion

Obesity has risen. People with a normal BMI reported fewer port site difficulties than those with a BMI of 25 or above.

The most common procedure in this study was a lap cholecystectomy, which was connected to complications at the port site. This is consistent with the findings of Fuller et al. Neudecker et al. proved that the number of ports enhanced the port site's complexity. Fascial closure is recommended for ports less than 10 mm; the fascia is sewn shut to reduce the likelihood of a herniated port. Retractors are ideal for seeing the fascia directly. The fascial edges are grasped, and the incision is closed with either interrupted or continuous sutures.

Several specialist instruments for fascial closure are created at the port (e.g., Grice suture needle, Carter-Thomson needle point suture passer, Endoclose device, Reverdin suture needle). The effectiveness of these devices has yet to be determined. The technique of sealing the rectus sheath had no effect on my study.

Port Site Discharge and Infection: PSI and other wound-related complications are less likely after laparoscopic surgery. They do, however, have the potential to cause serious morbidity. A fever and significant erythema surrounding the incision wound drainage may be indicators of necrotizing fascial infection. Only 15% of PSI instances were reported. These findings are similar to those of prior studies.

According to De Hoed and Shindholimath et al., the incidence is 5.3% to 6.3%. PSIs were always superficial, affecting just the skin and subcutaneous tissue. The most prevalent kind of skin infection is superficial skin infection. PSI was most often found at the umbilical port, followed by the epigastric port. There is an increasing incidence of umbilical site PSIs in the literature, as well as the function of umbilical flora in the formation of PSIs. The increased frequency of PSI and the trocar location of extraction are also highlighted. Because all specimens were extracted via the ports without the use of specimen bags, there is a higher incidence of infection compared to previous studies that used specimen bags.

Wound infections are avoided by using adequate antibiotic prophylaxis, sterile methods, and specimen bags during specimen extraction. When infections are discovered, they are cleansed, dressed, and treated with antibiotics depending on the sensitivity of the culture. [10]

Bleeding at the Port Site: A 6% incidence of bleeding was found at the port site. Our findings are comparable to previous study. All of them required the insertion of additional trocars. It was not related with bleeding when the port site was dilated for specimen removal. Carelessness during the operational process, often during installing secondary trocars (10mm size port), which should be implanted in the abdomen wall under direct vision and with preceding lighting, might result in epigastric vascular injury. [11]

Because the port may tamponade muscular or subcutaneous bleeding, bleeding from the abdominal wall cannot be evoked until the port is withdrawn. The access site should be visually examined not only when it is created, but also throughout and after the port removal.

Electrocautery is often used to identify and treat bleeding sites. A skin incision may be enlarged to halt the bleeding. If the bleeding persists, a Foleys catheter may be placed and inflated, and mild traction can be used to tamponade the spot. U-stitches may also be put into the abdominal wall utilising a suture passer and absorbable braided sutures under direct laparoscopic visualisation. Several specific instruments for the fascial closure of the port site are being developed to reduce abdominal wall haemorrhage.

Complications Caused by the Omentum: (Penetrating Injury/Entrapment) There was a 2% incidence of omental-related problems in this trial. A smaller number of complications are considered to arise as a consequence of a combination of factors, including the peritoneal cavity not being totally deflated after the ports were withdrawn and the incisions at the port site not being correctly or appropriately healed.

Here are some methods for controlling or preventing them: a) Following the operation, all ports were carefully removed. b) Remove all accessory ports while being monitored, and then open the valves on the 10 mm cannulas to relieve the pneumoperitoneum. c) After all of the gas has been released, the main port and camera should be engaged. Removing everything at once and ensuring that the port is always clear of clogged bowel, d) To keep port incisions modest, and e) Port sites 10 mm and bigger must have an adequate closure.

Incisional Hernia at the Port Site: The incidence of port site incisional hernia was 6%. This problem was more common in the elderly, those with big ports, and those who employed Hasson's approach. In addition, individuals who had infections in the postoperative phase had a greater prevalence of PIH. The risk of incisional hernia is reduced when trocars 12 mm, radially dilating trocars, or bladeless trocars are used.

If a port greater than 12 mm is used, the majority of authors close fascial defects regardless of location or trocar type¹¹. If the size is larger than 10mm, some people prefer closure. The fascia is sutured shut to reduce the chance of a PSH. Despite their rarity, hernias have been seen at trocar sites as tiny as 5 mm. If a PSH is discovered during a laparoscopy, the port location must be adjusted to prevent intestinal issues (obstruction and strangling).

Metastasis of the Port Site: Because there were no malignant patients treated with laparoscopy, there was no occurrence of PSM in the study. The prevalence of PSM after laparoscopic oncological procedures has been shown in recent studies, while the actual mechanism behind the abdominal wall metastasis remains unknown. However, several arguments are provided in the literature. According to research, using plastic bags or wound shields to avoid contamination with the tumour and wound may likely prevent the recurrence of PSM. Furthermore, the specimen must be taken from an abdominal incision big enough to allow the specimen to flow freely through.

Conclusion

Prospective research was conducted to investigate the morbidity at port sites in laparoscopic surgeries (both basic and advanced), encompassing elective and emergency procedures, as well as the risk factors for complications and their management. This research population consisted of 100 people and was conducted over a three-year period. The most prevalent LPSCs were discharge and infection, followed by bleeding, PSH, and metastases. These problems are more common in people who have the following factors: Hasson's approach of access or open, greater port size, The elderly, BMI increased; specimen retrieval bag was not utilised. The most prevalent problems occur more often at the umbilical port. The research documented the prevalence of LPSCs and compared it to figures from throughout the globe. All of these problems are resolved with little morbidity. The excellent surgical technique was during entry and departure at all port sites, which may avoid future complications.

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