Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

"A CLINICAL STUDY ON PORT SITE COMPLICATIONS IN LAPAROSCOPIC SURGERY"

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Abstract:

Background: Laparoscopic techniques have advanced the surgical profession and are more advantageous than laparotomies, including lowering patient morbidity, reducing hospital stays and returning to normal activities. Complications depend on portal site incision size, the number of ports, obesity, and umbilical ports. Complications include abdominal access through laparoscopic trocars vascular injuries, visceral injuries, air embolisms, subcutaneous emphysema, infections at the port site, portal site incisional hernias and metastasis at portal sites. **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, ACSR Medical College, Nellore for a period of 17 months from May 2022 to October 2023. **RESULTS & Conclusion:** A prospective study was analysed about the morbidity in the port sites in laparoscopic surgeries (both basic and advanced) including elective and emergencies, the risk factors of the complications and their management. This study population consists of 100 and was made in three years of the period. LPSCs were discharge, infection, bleeding, PSH and metastasis with discharge and infection being the most common. These complications are more in patients where the following factors were present: Open or Hasson's method of access, Larger port size, Old age group, Increased BMI, Not used of specimen retrieval bag.

Key Words: Laparoscopic Surgery, Port Access, Port Site, Complications

Introduction

Laparoscopic techniques have advanced the surgical profession and are more advantageous than laparotomies, including lowering patient morbidity, reducing hospital stays and returning to normal activities.[1] Laparoscopic surgery involves the usage of reusable metallic or disposable plastic trocars inserted through small incisions.

Laparoscopic surgery has been the standard of care for many surgical and gynaecological conditions had more benefits and good outcomes.[2] Laparoscopic surgery to open surgery is better aesthesis, pain is less and scarring, early ambulation and fewer stay in the hospital are the main reasons for preference. LPSC are accessed relating to or post-operative. Complications depend on portal site incision size, the number of ports, obesity, and umbilical ports.

Complications include abdominal access through laparoscopic trocars vascular injuries, visceral injuries, air embolisms, subcutaneous emphysema, infections at the port site, portal site

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

incisional hernias and metastasis at portal sites. These are rare complications.[3] About 1.4 out of every 1,000 laparoscopic operations result in serious problems.[4]

The incidence of LPSC is close to 21 per 100,000 procedures[5] and it has been demonstrated that the size of the port site incisions and trocar increases proportionally. The difficulties of gastrointestinal operations (0.06%), genitourinary surgeries (0.03%), vascular surgeries (0.01%), and omentum-related complications (0.04%)[6] make up the majority of the complications that follow laparoscopic procedures. Some of the less common issues include port site infections (PSIs) and pyoderma gangrenous[7,8] portal site metastases following laparoscopic oncosurgery.[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, ACSR Medical College, Nellore for a period of 17 months from May 2022 to October 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

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

TABLE NO:1 DIAGNOSIS OF THE CASES

Sex	No of Patients
Male	47
Female	53

TABLE NO:2 SEX DISTRIBUTION

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

TABLE:3 AGE DISTRIBUTION

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

TABLE NO: 4 SURGERY AND PORT SITE COMPLICATIONS

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

TABLE NO: 5 PORT SITE COMPLICATIONS

Port Type	No of Patients
Epigastric Port	3 (20%)
Umbilical Port	12 (80%)
Access Technique	
Closed	6 (40%)
Open	9 (60%)

TABLE NO: 6 PORT SITE INFECTION AND PORT TYPES, METHOD OF ACCESS

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 NO: 7 PORT SITE DISCHARGE WITH ACCESS TECHNIQUE, PORT SIZE & BMI

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

TABLE NO: 8 PORT SITE BLEEDING WITH ACCESS TECHNIQUE, BMI

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

TABLE NO: 9 PORT SITE HERNIA WITH PORT SIZE, BMI

BMI	OMENTAL ENTRAPMENT	SUBCUTANEOUS EMPHYSEMA
<25	0	0
>25	2 (100%)	2 (100%)

TABLE NO: 10 OMENTAL ENTRAPMENT & SUBCUTANEOUS EMPHYSEMA WITH BMI

DISCUSSION

Irrespective of age groups and both sexes have reported port site issues, which can be divided into access-related difficulties and postoperative complications. Depending on the literature, obesity is linked to higher morbidity at the port site Because of several factors, including the requirement of long trocars, a thick fatty abdominal wall, the requirement for a bigger skin incision to adequately expose the fascia, and restricted instrument mobility due to an increase in subcutaneous tissue[10].

Trocars must be carefully positioned so that their axes are aligned with those required for the process. In my investigation, the prevalence of illness associated to the port location and

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

obesity increased. People with those with a normal BMI had fewer port site issues than those with 25 greater BMI.

The most prevalent operation in this analysis was a lap cholecystectomy, which was linked to problems at the port site. This is similar to what Fuller et al. observed. Neudecker et al. demonstrated that the no of ports increased the complexity of the port site. For ports less than 10 mm, fascial closure is advised; the fascia is stitched shut to lessen the possibility of a herniated port. Ideally, retractors are used to directly see the fascia. The fascial margins are grabbed and either interrupted or continuous sutures are used to seal the wound.

At the port, several specialised tools are developed for fascial closure (e.g., Grice suture needle, Carter-Thomson needle point suture passer, Endoclose instrument, Reverdin suture needle). These gadgets' efficacy is not established yet. My research was unaffected by the rectus sheath's closing method.

Port Site Discharge & Infection: PSI and other wound-related problems are less common following laparoscopic surgeries. However, they have the potential to cause severe morbidity. Significant erythema around the incision wound drainage, together with a fever, may be signs of necrotizing fascial infection. 15% of cases of PSI were reported. These outcomes are comparable to several previous researches.

De Hoed and Shindholimath et al. found the incidence is 5.3% and 6.3%. All PSIs were superficial, involving only the skin and subcutaneous tissue. Superficial skin infection is more common. The most common site of PSI was at the umbilical port followed by the epigastric port site. In the literature, there is an increased frequency of umbilical site PSIs and the role of umbilical flora in the development of PSIs. Emphasis is also there on the increased frequency of PSI and the trocar site of extraction. There is a greater frequency of infection compared with the usage of specimen bags in other trials because all specimens were withdrawn through the ports without the use of specimen bags.

Wound infections are prevented by the appropriate administration of antibiotic prophylaxis, sterile techniques, and the usage of specimen bags during specimen extraction. Once infections are detected, they are properly cleaned, dressed, and treated with antibiotics based on the culture's sensitivity.

Port Site Bleeding: A 6% rate of bleeding at the port location was discovered. Our reports are Similar to other research. All of them included the insertion of supplementary trocars. It was generally not associated with bleeding with port site dilatation for specimen removal. Injury to epigastric vessels can be related to carelessness during the operative procedure usually while placing the secondary trocars (<10mm size port) which should be placed under direct vision and with prior illumination in the abdominal wall.

Bleeding from the abdominal wall cannot be elicited until after the port is removed because the port may tamponade muscular or subcutaneous bleeding. In addition to visually inspecting the access site upon its creation, the site should also be inspected during and following the port removal.

Bleeding points can usually be identified and managed with electrocautery. Sometimes to stop the bleeding, a skin incision may be expanded. If persistent bleeding continues, a Foleys catheter can also be inserted and inflated, and gentle traction is applied to tamponade the site.

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Also, U-stitches can be placed into the abdominal wall under direct laparoscopic visualization using a suture passer with absorbable braided sutures. For controlling abdominal wall bleeding, several specialised tools are developed for the fascial closure of the port site.

Omentum Related Complications: (Entrapment/Penetrating Injury) In this study, 2 % incidence of omental-related complications. A lower number of difficulties are thought to develop as a result of several circumstances, including, the peritoneal cavity not being completely deflated when the ports were removed, and the incisions at the port site were not properly or adequately closed.

These are some ways to control or prevent them: a) All ports were carefully removed following the process. b) All accessory ports must be removed while being watched, and then the valves on the 10 mm cannulas must be opened to release the pneumoperitoneum. c) The primary port and camera are to be activated following the release of all the gas. Removing everything simultaneously and ensuring that the port is constantly free from blocked bowel, d) To keep the port incisions small, and e) The port sites with a size of 10 mm and larger shall have an appropriate closing.

Port Site Incisional Hernia: The port site incisional hernia incidence was 6 %. This complication was more in the old age group, large port and in whom Hasson's technique was used. There is also a higher incidence of PIH among patients who had infections in the postoperative period. The risk factor of incisional hernia is low with the use of trocars ≤12 mm, radially dilating trocars, or bladeless trocars.

Regardless of the location or trocar type, the majority of authors close fascial abnormalities if a port larger than 12 mm is employed[11]. Some like closure if the size is greater than 10mm. To lessen the possibility of a PSH, the fascia is sutured shut. Despite being uncommon, hernias have been documented at trocar sites as small as 5 mm. If a PSH is found during a laparoscopy, the port site must be corrected to stop intestinal problems from occurring (obstruction and strangulation).

Port Site Metastasis: The lack of malignant patients treated with laparoscopy meant that no instance of PSM in the study. The frequency of PSM following laparoscopic oncological operations has been shown in certain recent research, although the precise mechanism behind the abdominal wall metastasis remains unclear. But numerous justifications are offered in the literature. Studies suggest that employing plastic bags or wound shields to prevent contamination with the tumour and the wound can probably prevent the recurrence of PSM. Additionally, the specimen must be removed from an abdominal incision that is large enough for the specimen to pass through easily.

Conclusion:

A prospective study was analysed about the morbidity in the port sites in laparoscopic surgeries (both basic and advanced) including elective and emergencies, the risk factors of the complications and their management. This study population consists of 100 and was made in three years of the period. LPSCs were discharge, infection, bleeding, PSH and metastasis with discharge and infection being the most common. These complications are more in patients where the following factors were present: Open or Hasson's method of access, Larger port size, Old age group, Increased BMI, Not used of specimen retrieval bag.

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The most common complications are seen more at the umbilical port. The incidence of LPSCs was noted in the study and is compared with statistics worldwide percentage-wise. All these complications are resolved with the least amount of morbidity. At all port locations, the good surgical technique was during entrance and exit, which can reduce difficulties in the future.

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