

TYPE OF ARTICLE – Original Research Article

Port-site complications following laparoscopic surgery – A hospital based Cross-sectional study

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Received : 19-02-2024/ Revised: 12-03-2024/Accepted Date: 02-04-2024

Abstract

The study aims to assess the morbidity associated with ports at the site of their insertion in laparoscopic surgery, to define, control risk factors for complications and their management. All patients who underwent laparoscopic surgeries, between 2022 and 2023 in the Department of General Surgery , VIMSAR, Sambalpur after receipt of written consent were included, and port sites were monitored for complications. Data collected and analysed by various statistical methods. Of the 100 patients undergoing laparoscopic surgery, 36 had developed complications directly linked to the port-site during a minimum follow-up; port site discharge (PSD) was the most frequent, followed by port site infection, bleeding.

Introduction

Laparoscopic techniques have transformed the surgery and offer several advantages over laparotomy, including reduced hospital duration of stay, earlier return to normal activities and, reduced patient morbidity rates. Although rare, port site complications have been reported in the studies. Laparoscopic port site complications can be immediate access related or post-operative. Complications are related to port-site incision size, the number of port sites, obesity, and umbilical ports.

Minimally invasive surgeries such as laparoscopic surgeries have become the order of the day for many surgical diseases. The main reason for laparoscopic surgeries to abdominal surgeries is less pain and scarring, faster convalescence and, lesser hospital stays. Also, more and more surgeries are being performed laparoscopically as a result of advancements in medical science. However, a rapid expansion in volume and complexities of laparoscopic surgeries has been accompanied by complications, most of them can be directly ascribed to abdominal access [1,2] with laparoscopic trocars, including visceral

injuries, vascular injury, air embolism, subcutaneous emphysema, port sites infections, port site incisional hernia and metastasis at the port sites. These complications are, by far, infrequent. The overall incidence of major complications following a laparoscopic procedure is approximately 1.4 per 1,000 procedures [3]. However, the prevalence of port-site complications following laparoscopic surgery is considered to be around 21 per 100,000 cases [4]. The rise was proportional to the scale of the port site incision and the trocar [5,6]. The overall incidence of complications/injuries that occur following laparoscopic surgeries involve vascular (0.01%), genitourinary (0.03%), omentum (0.04%), and gastrointestinal (0.06%) [7,8]. However, other rare complications include pyoderma gangrenosum [9], metastasis at the port site following laparoscopic oncosurgery [10,11], and port site infections (PSIs) [12].

Aims and Objectives of the Study

1. The study aims to identify the complications associated with the port site in laparoscopic surgeries.
2. To identify the risk factors
3. Anticipating complications and suggest timely preventive measures.

Materials and Methods

Study Design: Prospective study

Period of Study: 2 Years

Sample Size: 100 Patients

Inclusion Criteria

1. Patients who have undergone basic and advanced laparoscopic surgeries in the Department of General Surgery, VIMSAR, Sambalpur, Odisha.
2. Patients more than 14 years of the age.
3. Patients who are willing for inclusion in the study

Exclusion Criteria

1. Patients converted to open surgeries.
2. Patients did not consent to inclusion in the study.

Results

TABLE 1 -

Diagnosis	No. of Cases
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Abdominal pain for evaluation	18
Acute Appendicitis	14
Acute Cholecystitis	15
Cholelithiasis	31
Chronic Appendicitis	8
Inguinal Hernia	2
Subacute Appendicitis	5
Umbelical Hernia	4
Epigastric Hernia	3
TOTAL	100

Of the 100 cases, 46 had laparoscopic cholecystectomy, 27 had laparoscopic appendectomy, 18 had diagnostic laparoscopy and 9 had laparoscopic hernia repair respectively. Out of 100 patients 52 were female and 48 were male patients.

TABLE -2

Age in Years	No. of Cases
13-30	19
31-40	43
> 40	38
TOTAL	100

Majority of the patients belong to the age group 31- 40 yrs.

TABLE -3

Type of Complications	Number of Cases
Port Site Infections	11
Port Site Discharge	14
Bleeding	05
Port Site Hernia	06
Port Site Metastasis	00
Subcutaneous Emphysema	00
Omental Entrapment	00

Total number of port site complications were 36. 14 cases had PSD, 11 cases had PSI, 6 cases had PIH, 5 cases presented with intra-operative bleeding.

TABLE – 4

Type of Procedure	Number of Cases with Port site infections
Lap cholecystectomy	05
Lap appendectomy	04
Diagnostic laparoscopy	02
Lap Hernioplasty	00

TOTAL	11
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Out of 100 cases, 11 cases had Port site infection. 5 cases of lap cholecystectomy, 4 cases of Lap appendectomy, 2 cases of diagnostic laparoscopy presented with port site infection. Out of 11 cases of Port site infection, 9 presented at umbilical port site, 2 presented at epigastric port site. Out of 11 cases of Port site infection, 9 presented in cases where open access technique was used and 2 presented in cases where close access technique was used. Of the 14 cases of port site discharge, 11 cases presented in patients with BMI > 25 and 3 cases presented in patients with BMI < 25

Discussion

A total of 100 patients were admitted in the surgical wards of VIMSAR, SambalpurOdisha, undergone laparoscopic surgeries and satisfied the inclusion criteria were included in the study. All patients received antibiotics preoperatively. Reusable ports were used in 100 cases. After sterilization with ethylene oxide, they were reused. All the instruments have been carefully removed under vision after the completion of surgery. The fascia of ports of size ≥ 10 mm was closed. PSI was established in accordance with the National Nosocomial Infections Surveillance (NNIS) system, Centers for Disease Control and Prevention (CDC). Wounds were assessed clinically after surgery and were treated with regular cleaning and dressing, with empirical oral antibiotics in case of infection. PSI has been studied in relation to frequency, type of surgery. Similarly, port site bleeding was studied in concerning with frequency, site, type of ports, and size of ports. Omentum related complications were studied concerning with type of surgery, the number of ports, and the port site involved and frequency. Further port site complications were assessed in relation to age, sex, body mass index (BMI), the total number of ports used, use of specimen bag, port closure technique, and procedure performed. Port site complications can be classified into access-related complications, and post-operative complications have been reported in all age groups and in both genders. The literature shows that obesity as a dominant risk factor associated with increased morbidity related to the port site due to various components like the need for longer trocars, thick abdominal wall, the need for wider skin incisions to reveal the fascia sufficiently, restriction in instrument’s mobility due to the increased subcutaneous tissue. Care must be taken during the trocar placement to align their axis as needed for the procedure. Laparoscopic cholecystectomy is the commonest procedure associated with port-site complications. The rate of port site complication increases with the number of ports used. In the current study, there was an increase in the frequency of morbidity related to the port site and obesity. Patients with more BMI had more port site complications than those with normal BMI. Closure of fascia is recommended for ports ≥ 10 mm; the fascia is closed with sutures to reduce the future risk of developing a port site hernia. Re approximation of the fascia can be achieved in a number of ways. With the help of retractors, the fascia is directly visualized. The fascial edges are grasped and then sutured closed with an interrupted or continuous suture. Many instruments have been devised specially for the closure of fascia at the port site (e.g., Reverdin suture needle, Grice suture needle, CarterThomson needle-point suture passer, Endo Close

instrument). The benefit of these specialized devices is yet to be proven. The rectus sheath closure technique did not influence the present study.

Summary

- This prospective study aims to analyze the morbidity associated with the port site in laparoscopic surgeries(Basic and advanced), both elective and emergencies, to determine the risk factors of the complications and their management.
- The study population consisted of 100 patients and was carried out over two years of period. The port site complications were discharge, infection, bleeding, port site hernia and, metastasis, with port site discharge and infection being most common.
- These complications were more in a patient where the following factors were present: (1) Open or Hasson's method of access (2) Larger port size (3) Old age group (4) Increased BMI

Source of Support – Nil

Conflict of Interest – None declared

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