International Surgery Journal
Mudgal MM et al. Int Surg J. 2018 Feb;5(2):598-601
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20180360

Original Research Article

Port site complications following laparoscopic surgeries: a prospective study

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Received: 02 December 2017
Accepted: 28 December 2017

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ABSTRACT

Background: Port site complications are bothersome complications which undermine the benefits of minimal invasive surgery, not only does it add to the morbidity of the patient but also spoil the reputation of the surgeon. Aims and objective of the study was to determine the morbidity associated with the port site complications in laparoscopic surgery and to identify risk factors for complications.
Methods: Three hundred patients having age between 15-50 years admitted for elective laparoscopic procedure were studied. All the patients had preoperative workup and general anaesthesia was given with endotracheal intubation. The patients were observed for any port-site complication during operation and in the immediate and postoperative till three months.
Results: Female preponderance (77.34%) was observed with maximum patients belonging to age group of 41-50 years (31.7%). Majority of the patients were in the BMI range of 18.5-25kg/m^2 (53.33%). In 54.66% and45.33% patients Verres needle and Hasson's (Open) method was used to create pneumoperitoneum. Cholecystectomy was the indication in 80% patients. Port site morbidity was observed in 8.67% patients. As an early port site complication, bleeding, surgical site infection, emphysema and visceral injury was observed in 6, 8, 4 and 1 patient respectively. As a late port site complication, 4 and 3 patients developed hernia and hypertrophic scar respectively.
Conclusions: Port site complications are least in elective laparoscopic surgery.

Keywords: Body mass index, Endotracheal intubation, Laparoscopic procedure, Port-site complication

INTRODUCTION

Laparoscopic surgery has replaced the open surgery and has revolutionized the field of surgery. Decreased postoperative pain, early return to normal activity and least post-operative complications are few of the its advantages.[1] The incidence rate of major complications following laparoscopic surgery is around 1.4 per 1,000 procedures.[2,3]

Nevertheless, incidence of port site complications after laparoscopic surgery is documented to be around 21 per 100,000 cases. The rate of port site complications is increased with increasing size of the port site incision and trocar.[4,5]

Complication following laparoscopic surgeries includes gastrointestinal (0.6 per 1,000), genitourinary (0.3 per 1000), vascular (0.1 per 1,000), and in omentum (0.4 per 1,000). However, metastasis after laparoscopic Oncosurgery, pyodermagangrenosum and port site infections are rare.[6,7]

Hence, present study was done to determine the complications associated with port site in laparoscopic surgery and its associated risk factors.

METHODS

Present prospective study included 300 patients of either sex admitted for elective laparoscopic procedure. Each patient in the study group was examined separately.

All adult patients undergoing elective laparoscopic surgeries were included and patients having age less than 15 years and more than 50 years and with skin disorders, patients with co-morbid conditions such as intestinal tuberculosis, diabetes mellitus, HIV, hepatitis and immunocompromised conditions, patient with previous abdominal surgeries and previously infected case were excluded from the study.

All the patients had preoperative workup including a complete blood count, blood urea, serum creatinine, blood sugar assessment, ultrasonography of abdomen, x-ray of chest, and electrocardiography. All patients were properly assessed by the anaesthetist preoperatively. Usual antibiotic regime comprised of two shots of intravenous 3rd generation cephalosporin (ceftriaxone) on the day of surgery followed by either oral or intravenous antibiotics as indicated was given.

All patients were given general anaesthesia with endotracheal intubation. The 10 mm ports were closed in two layers. The rectus sheath was closed with polyglactin (No. 1) suture while the skin was closed with monofilament polyamide (2-0) suture. The 5mm ports were closed in single layer. Only the skin was closed with monofilament polyamide (2-0). Most of the patients were discharged on third or fourth postoperative day.

The patients were observed for any port-site complication during operation and in the immediate and remote postoperative period. For this, the patients were asked to come for weekly follow-up at OPD for the first month postoperatively and subsequently once every month for at least three months. Any complication found was noted down and the data gathered was analysed.

All the data were analysed using IBM SPSS ver. 20 software. Data were expressed as number and percentage. Frequency distribution was used to tabulate the data. Level of significance was assessed at 5%.

RESULTS

Out of 300 patients, 68 (22.67%) patients were males and 232 (77.33%) were female. Maximum patients had age between 41-50 years [95 (31.7%)] followed by 31-40 years [94 (31.3%)].

Out of 300 patients, 39 (13%) had BMI <18.5kg/m^2, 160 (53.33%) had BMI between 18.5-25kg/m^2 and 70 (23.33%) had BMI in the range of 25-30kg/m^2.

Out of 300 patients, Verres needle was used for creating pneumoperitoneum in 164 (54.66%) patients and Hasson's (Open) method was used in 136 (45.33%) patients. Out of 300 patients, 240 (80%) patients underwent lap cholecystectomy, 32 (10.67%) underwent lap appendicectomy, 16 (5.33%) underwent diagnostic lap, 10 (3.33%) underwent lap hernia and remaining 2 (0.6%) patients underwent lap nephrectomy. Port site morbidity was observed in 26 (8.67%) patients (Table 1).

Table 1: Port site complication.

Complication		Frequency	%
Early	Bleeding	6	2
	Surgical site infection	8	2.6
	Emphysema	4	1.33
	Visceral injury	1	0.33
Late	Hernia	4	1.33
	Hypertrophic scar	3	1
	Port site metastasis	0	0

Out of 300 patients, 4 patients developed port site hernia, all had BMI >30kg/m^2 out of which 3 were females. Out of 300 patients only 1 patient had visceral injury and that too associated with Verres needle method of creating pneumoperitoneum.

DISCUSSION

Port site complications can be classified into access-related and postoperative complications and have been reported in both the genders and all age groups.[8]

In present study lap cholecystectomy (80%) was the commonest procedure performed and was more frequently associated with port site complications. Fuller et al reported similar observations.[9] Similarly Neudecker et al, had reported that port site complications were increased with more number of ports.[10]

A study from Mangalore, Karnataka by Karthik et al on 570 patients who underwent laparoscopic surgeries, reported that 3% had complications at port site during a minimum follow-up of three months; port site infection being most common (1.8%) followed by port site bleeding (0.7%), omentum-related complications (0.35%) and port site metastasis (n = 1, 0.175%).[8] Similarly in present study port site morbidity was seen in 8.67% patients; among them bleeding, surgical site infection, emphysema and visceral injury were observed in 6, 8, 4 and 1 patients respectively.

Laparoscopic procedures are reported to be have a reduced incidence of port site infections, in present study only 2.6% patients had surgical site infection, in agreement to present study Den Hoed et al found the incidence to be 5.3%, Shindholimath et al 6.3% and Colizza et al <2%.[11-13] Surgical site infection can be prevented by using appropriate antibiotic prophylaxis and sterile techniques. Dugg et al studied 90 patients undergoing laparoscopic cholecystectomy and reported

that only three developed port site infections. No case of port site bleeding, discharge and hernia were reported in follow-up period.[14] Ahmed et al and Memon et al are also in agreement with the present study and reported lower infection rate of 0.31% and 1.8% respectively with laparoscopic surgeries.[15,16] However, Voitk et al and Hamzaoglu et al showed slightly higher rate of infections (9% and 8% respectively).[17,18] Kumar et al studied 104 patients and reported incidence of port site infection as 5.7%.[19]

In present study port site bleeding was observed in 2% patients which is comparable to the reports of Quilici et al.[20] Bleeding points can usually be identified and managed with electrocautery.

Different authors have reported that obesity is associated with increased morbidity related to port site.[21,22] The possible reasons for increased morbidity in obese patients may be due to need for longer trocars, thick abdominal wall need for larger skin incision to expose fascia adequately, and limitation in mobility of the instrument.[23] In present study 23.33% had BMI between 25-30kg/m^2; out of that only 4 patients developed port site hernia which means in present study, there was no increase in the frequency of morbidity related to port site and obesity. Similar results were reported by Karthik et al.[8]

Cross sectional nature of the study limits the findings to be considered for the population, a large randomized clinical trial is required to strengthen the present study results.

CONCLUSION

Present study has shown that post-operative discomforts are least with laparoscopic surgery. Laparoscopic surgery has replaced the open surgery with extremely low morbidity and mortality. Cholecystectomy being the most commonly involved procedure resulted in common complication at port site which include infection and bleeding.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Mudgal MM, Kothiya PK, Kushwah N, Singh R. Port site complications following laparoscopic surgeries: a prospective study. Int Surg J 2018;5:598-601.