ORIGINAL RESEARCH PAPER

Volume-7 | Issue-1 | January-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ANALYSIS OF PORT SITE COMPLICATIONS IN LAPAROSCOPIC SURGERIES IN A TERTIARY CARE CENTRE.

General Surgery

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ABSTRACT

Laparoscopic surgery is preferred over open surgery for almost all abdominal pathologies because of the obvious advantages it renders and relatively less wound related complications. However, port site complications in laparoscopic surgeries can enhance the morbidity and thus reduces its overall benefits. These occur due to improper asepsis or instrument sterilization, or nonadherence to safety measures during trocar placement or removal at port sites. A prospective study of 630 patients, who underwent laparoscopic surgeries for various diseases, reveals an overall incidence of port site complications in 26 cases (4.12%). Of the various known complications, portsite infection was the commonest in 15 cases and port site herniation is the least common in one case. Adoption of strict asepsis, adequate sterilization methods and adherence to safety measures during placement and removal of trocars at port sites, can significantly reduce the incidence of port site complications.

KEYWORDS

Laparoscopic surgery, port site complications, laparoscopic instrument sterilization, safety measures for port placement.

INTRODUCTION:

The introduction of minimal access surgery, in the form of Laparoscopic surgery has revolutionised the field of abdominal and pelvic surgery, since its first application on human being by Mauret in 1987 in France. The complications arising due to the laparoscopic surgery is less frequent and less severe compared to the traditional open surgery. Most of the complications are related to the technique of placement of ports in the abdominal wall. Thorough knowledge of the surgical anatomy of the anterior abdomen, necessary precaution adopted during placing and removing trocar and canulas at the port sites is essential. An equal importance, in preventing port site complications, lies in the adoption of the standardised sterilization protocol both for the port site tissue and the surgical instruments used. Removal of grossly infected or potentially contaminated or suspicious malignant tissue routinely in a BERT (bag for endoscopic retrieval of tissue) reduces port site complications like infection and malignant invasion. So also, thorough cleansing of the port, especially involved in the removal of the excised tissue or organ through it, bears significant role in the reduction of contamination and port site infection. Special care taken during the removal of the last port, i.e, removal of the umbilical or camera port is of paramount importance in preventing port site entrapment of omentum and subsequent hernia formation. All the necessary skills and information needed to reduce the complications due to laparoscopic surgery, can be achieved or optimised, if the surgeon beforehand is adequately trained in the art and the junior staffs including paramedical staffs, involved in the laparoscopic surgery unit are under strict and constant observation.

Despite a minimal port site related complications, laparoscopic surgery has received huge acceptance worldwide, because of the well proven benefits it renders like decreased postoperative pain, early mobility, shorter hospital stay, better cosmesis and an early return to activity [1].

MATERIALS AND METHODS:

This prospective study includes 630 patients, with different intra abdominal pathologies planned for laparoscopic surgery under general anesthesia, in the department of General surgery at Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha during the period from July 2014 to December 2016. Laparoscopic surgery was conducted and supervised by senior faculties in respective units in the department of general surgery.

All the patients received general anesthesia and an I.V. dose of Cefotaxime (1gram) prior to induction of anesthesia and two more doses postoperatively. In the preoperative preparation, all the patients were for advised shaving of the body part the night before and a complete body bath with antiseptic soap on the morning of surgery. ETO sterilized laparoscopic instruments and reusable ports were used for all cases. Instruments were dismantled, thoroughly washed under running tap water prior to sterilization. As a routine practice, organ or tissue retrieval port site is thoroughly cleaned with normal saline. Fascial closure of all the ports of size 10mm or more was ensured with 1-0 port closure vicryl. Port site wound routinely inspected after 24 hours or prior to discharge in all cases.

INCLUSION CRITERIAS:

Cases fit for laparoscopic surgery under general anesthesia.

EXCLUSION CRITERIAS:

Cases with previous open abdominal surgery, suspected or diagnosed cases of malignancy, known pyoperitoneum, patients in sepsis and those undergone conversion to open procedure due to obvious reasons intraoperatively.

OBSERVATION & RESULTS:

All the cases were reviewed for port site complications that were encountered during trocar placement and removal intraoperatively, as well as those occurring up to 3 months of follow up in the postoperative period. The observations were documented and monitored prospectively. The sex, age, ,various laparoscopic procedures conducted, incidence of different port site complications, respective port sites involved were tabulated, analysed and the results correlated with that of the previous observers and discussed.

TABLE 1: Sex distribution of patients for laparoscopic surgery

Sl. No.	Sex	No. of cases (% age)
1	Male	258 (40.9%)
2	Female	372 (59.1%)
Total – 630 (100%)		

In our prospective study of 630 patients, 258 males and 372 females undergone laparoscopy surgery (M: F ratio of 1:1.44).

TABLE 2: Age wise distribution of different patients for laparoscopic surgery

Sl. No.	Age group	No. of cases (%age)
1	10 - 20 years	85 (13.49 %)
2	21 - 30 years	178 (28.25 %)

3	31 - 40 years	138 (21.90 %)
4	41 – 50 years	105 (16.66 %)
5	51 – 60 years	70 (11.11 %)
6	> 61 years	54 (8.57 %)
Total – 630 (100 %)		

178 patients (28.25%) in the age group 21-30 years is mostly involved in various diseases requiring management by laparoscopic surgery, followed by age group 31-40 years (21.90%) and the incidence is least beyond 61years of age (8.57%).

TABLE 3: Distribution of various types of laparoscopic surgery in our study

Sl. No.	Type of laparoscopic Surgery	No. of cases (% age)
1	Laparoscopic cholecystectomy	364 (57.70 %)
2	Laparoscopic appendectomy	220 (34.92 %)
3	Laparoscopic hernia repair	28 (4.40 %)
4	Other laparoscopic surgeries: Ovarian cystectomy/fenestration Adhesinolysis Urachal cyst excision Hydatid cyst excision	18 (2.85 %) [08] [06] [02] [02]
Total – 630 (100%)		

In our study, the distribution of the pathology based various laparoscopic surgeries shows, laparoscopic cholecystectomy as the most common indication in 364 cases (57.70%), followed by laparoscopic appendectomy in 220 cases (34.92%). Other rare surgeries combined, constitute only 2.85% of the total.

TABLE 4: % age distribution of different port site complications and in comparison to the total number of cases.

Sl. No.	Specific port site complication	No. of cases (% age)	%age of total no. of cases (n=630)
1	Infection	14 (53.84 %)	2.22 %
2	Bleeding	5 (19.23 %)	0.79 %
3	Emphysema	3 (11.53%)	0.47 %
4	Omental injury	2 (7.69%)	0.32 %
5	Hernia	1 (3.84%)	0.16 %
6	Tuberculosis	1 (3.84%)	0.16 %
Total – 26 (100%)			4.12 %

Out of the various possible port site complications, port site infection including a case of atypical mycobacterial infection was the most frequent in 15 cases (57.69%) and port site hernia of omentum is the least frequent i.e., 1 case (3.84%) in our study.

TABLE 5: Distribution of cases based on port site complication

Sl. No.	Site of the port	Port site Infection	Port site bleeding	Port site emphysema	Port site omental injury	Port site hernia	Port site Tuberc-Ulosis	No. of cases affected (% age)
1	Umbilical	7	2	2	2	1	1	15 (57.69%)
2	Epigastric	5	2	0	0	0	0	7 (26.92%)
3	Suprapubic	2	0	1	0	0	0	3 (11.53)
4	Lt. Iliac fossa	0	1	0	0	0	0	1 (3.84 %)
5	Rt. subcostal	0	0	0	0	0	0	0
6	Rt. axillary	0	0	0	0	0	0	0
Total – 26 (100 %)								

The frequent port site related complications, during laparoscopic surgery or in the postoperative period is encountered at umbilical port in 15 cases (57.69%), followed by epigastric port in 7 cases (26.92%). Lateral 5mm port sites at subcostal and anterior axillary region were not involved in complication in this study.

DISCUSSION:

Laparoscopic surgery is considered as the gold standard procedure for many surgical conditions as it provides the patient with various advantages over the conventional open surgery like small incision with better cosmesis, less pain, shorter hospital stay and early return to activity. Laparoscopic surgery too, runs the risk of complications as in open surgery, though to a lesser extent. Laparoscopic port site complication can be access related, i.e., during placement of the 1st trocar, in the form of bleeding, omental, bowel or vessel injury or postoperative in the form of port site infection, emphysema, herniation, tuberculous infection or malignancy. The port site complications may be the cause of concern or dissatisfaction by the patient, especially when it needs further treatment or surgical correction.

The overall port site complication rate by different observers varies between < 2% to 6.3% [2, 3]. In our study of 630 patients, 26 patients (4.12%) suffered port site complications. This is in accordance with the result of previous observers, A sex ratio of M: F = 1:1.53 can be explained on the basis of higher incidence of gallstones and its management by laparoscopic cholecystectomy in female [4]. A gallstone prevalence rate of 6.12% with M: F ratio of 1:3.1 has been reported by Kharoo from Kashmir, with higher incidence observed in multiparous and women in 6th decade of life [5]. In our study of 630 patients, 178 patients (28.25%) in the age group of 21-30 years were involved maximally, in various diseases necessitating laparoscopic surgery and the least involved were > 61years in 54 (8.57%) cases.

Hassan first described the open entry technique for 1st trocar placement in 1971. We adopt an open technique using blunt tipped trocar as an alternative to create pneumoperitoneum by Varees needle and blind insertion of the 1st trocar. 2 cases (0.31%) of omental injury were encountered during 1st port placement which is comparable with the findings of previous observers (0.02 to 1.6%) [6]. Fascial closure of all the ports of > 10 cm size was routinely practised to prevent port site hernia formation, as is followed by other observers [8]. Inturrupted absorbable (port closure vicryl) was used to approximate the cut edges of fascia. Port site hernia though rare, has been reported even at site of 5mm trocar and can be prevented by the adoption of certain principles like proper closure of all ports > 10mm size, use of non absorbable suture for larger or stretched out port site wounds, removal of ports under vision and that of last trocar along with the camera as well as repair of pre-existing silent umbilical or paraumbilical hernias at the same time [7]. We encountered one case (0.15%) of umbilical port site hernia, presented after 2 months of surgery and corrected surgically under anesthesia. Port site bleeding usually occur during the placement of secondary trocars which should be placed under direct vision and illumination of the site in the anterior abdominal wall (diaphanoscopy). In this study, we encountered port site bleeding in 5 cases (0.79%) which is in correlation with previous studies [9]. Bleeding at port sites are usually controlled by direct pressure of the trocar, inflating the balloon of a Foley's catheter and applying traction and the resultant tamponade effect on the bleeding vessel, application of 'U' stitches or with the help of a suture passer needle. The wound related complications are less in laparoscopic surgery than open surgery [10]. However their occurrence causes morbidity and diminishes the benefits of laparoscopic surgery. Most of these are superficial involving skin and subcutaneous tissue [11]. Port site wound infection as defined by NNIS system (National Nosocomial Infection Surveillance) and CDC (Center for Disease Control and prevention), usually present with local erythema, tenderness, fever and local discharge [12]. We routinely remove the gallbladder through the epigastric port, but umbilical port is most involved in infection, as in 8 cases (53.3%) out of total 15 cases followed by epigastric port in 5 cases. Factors responsible include superficial skin infection, umbilical flora and the port through which the organ or tissue is retrieved [13]. Our study shows a port site infection in 15 cases (2.38%) of 630 cases which well correlated with previous studies [2, 3]. All port site infections were controlled by local antibiotic and saline dressing and an oral antibiotic course for 5 days. Port site atypical mycobacterial infection, in one case of non healing wound after 3 weeks of discharge, inspite of routine measures was detected by Z-N stain of secretion positive for AFB and confirmed by excised sinus tissue biopsy report. This was settled by local wound excision and ATT for 9 months [14]. The overall port site complications in our study occurred in 26 cases (4.12%). Similar results are shown by various authors with incidence of <2% to 6.3% [2, 3, 15]. The incidence of port site complications increases proportionately with increasing size of incisions for trocars [16].

Adoption of proper sterilization technique and prophylactic antibiotic cover is very important to reduce port site infection. We maintain standard protocol for sterilization of all the laparoscopic instruments by ETO for the first case of the theatre, and subsequent cases by thorough cleansing of dismantled instrument parts under tap water and dipping them for a minimum of 20 minutes in 2% liquid

glutaraldehyde. The instruments are then treated with warm normal saline prior to use. Almost all the infective complications were managed by local dressing and 3 to 5 days oral antibiotics. Only one case of port site omental hernia at the umbilical port site needed reoperation and surgical correction with fascial closure.

CONCLUSION:

Laparoscopic surgery though, proven and well established as the gold standard for performing cholecystectomy and is the approach of choice in today's surgical practice for almost all pathologies, still runs the risk of procedure related complications, which is of lesser severity and lower morbidity, as it involves minimal tissue dissection . Port site complications are usually non-life threatening except for accidental major vessel injury. Common causes of port site complications include a lack of maintainance of strict asepsis and sterilization methods or non adherence to safety methods during trocar placement, especially at the first camera port site or the removal of last trocar. Adoption of these safety measures during laparoscopic surgeries can significantly reduce the incidence of port site complications.

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