

## **A Study of Port Site Infections in Laparoscopic Surgeries**

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### **Abstract:**

**Background /Aims:** To assess the port site infections in patients who underwent laparoscopic surgeries in department of general surgery in a medical college hospital and how to prevent and treat port site infections .

**Design:** prospective study

**Material & Methods:** In this descriptive study , a total number of 104 patients who underwent laparoscopic surgeries for various diseases between October 2013 to March 2015 at our hospital were observed for port site infections . Culture sensitivity were taken for all patients who developed port site infections .Variables like number of ports used in surgery , port site , port size, time duration from abdominal incision to primary trocar entry , causative organism , surgery – infection interval and indication of surgery were analysed using appropriate statistical analytical tests.

**Results:** The incidence of port site infection in our study is 5.7%. the port site infection is more common at umbilical site , in 10mm port size and in surgeries using 3 ports . Most common causative organism is staphylococcus aureus.

**Conclusion:** Port site infections in laparoscopic surgeries are minor complications , but still these complications are preventable one by proper sterilization of laparoscopic instruments.

**Keywords:** port site infection (PSI), laparoscopic surgery, Glutaraldehyde

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### **I. Introduction**

Minimally invasive surgery particularly laparoscopic surgery has become the surgical treatment for many surgical diseases. Laparoscopic surgeries are associated with shorter hospital stay and convalescence, less pain and scarring. Major complications are usually due to access related complications .Major vascular injury or inadvertent bowel injury are the serious life threatening complications usually occurring during initial access in to the abdomen .[1][2]

The total complication rate of laparoscopic surgeries was 3.6 /1000 procedures and the rate of major complication was 1.4/1000 procedures[3]. Current practice of immersing laparoscopic instruments for 20 min in 2% alkaline glutaraldehyde should be re-examined, according to a recent study[4]. They also recommend that disinfectant solution used for sterilisation was responsible for port site infections.

Aim of our study is to assess the port site infections in laparoscopic surgeries and its management. To prevent the infection, proper sterilisation and storage of instruments is recommended. The centers for Disease control & prevention classification (CDC)categorised Surgical Site Infection (SSI) in to incision site infection and organ space infection. The incision site infection is divided in to superficial and deep infection . Superficial means only skin and subcutaneous tissue infection whereas deep means fascia and muscle involvement [5].

### **II. Materials And Methods**

The study included 104 patients who underwent laparoscopic surgeries for various indications in surgical units of our institute over a period of 18 months from 1<sup>st</sup> October to 31<sup>st</sup> March 2015 in the Department of general surgery , Karpaga Vinayaga Institute of Medical Sciences , Maduranthagam. All those patients who

underwent laparoscopic surgeries during the above period were included in the the study and those patients who were converted to open procedures were excluded from the study.

In all the patients preoperative preparation was done by complete bath prior to surgery using antiseptic soap and the parts were prepared by shaving method. All patients received prophylactic antibiotics during induction of general anaesthesia. All surgeries were done under general anaesthesia. Pneumoperitoneum created using veress needle in supra or infra umbilical incision . Through the same incision, a 10 mm safety trocar (primary trocar ) introduced in to the abdominal cavity. The time duration from abdominal incision to primary trocar entry was calculated .All the specimens like gallbladder and appendix were extracted without endobag. All 10 mm port closure was done by hand sewn intermittent suture.

All laparoscopic instruments were sterilised by 2 % glutaraldehyde solution with a contact time of 20 minutes .Before surgery ,all the instruments were washed warm saline. In our study , 6 patients (5.7%) out of 104 patients were developed port site infection(PSI) and all of them were superficial port site infection(SPI). Culture sensitivity taken from all the PSI patients and sent to microbiology department for analysis.

### III. Results

In our study , 104 patients were operated including 26 male and 78 females. The incidence of PSI is 5.7 %(6/104). PSI were common in 30 – 40 year age group and more common in females. Laparoscopic appendectomy was the most commonly performed procedure(Table 2) which developed PSI (55% ). PSI more commonly seen in 10mm (port size) & umbilical (port site) (Table 1). The time interval between surgical period and PSI was very commonly seen within 2 weeks. All PSI were superficial port site infections . Most common causative organism was staphylococcus aureus (83%). PSI mostly present (83%), if the time duration from the abdominal incision to primary trocar entry is more than 5 minutes. All PSI were treated with empirical antibiotics and daily dressing . Once , getting wound culture sensitivity results , patient was changed to concerned antibiotics.

### IV. Discussion

Laparoscopic surgery is the gold standard for many surgical diseases. Even many patients demanding laparoscopic surgery because of their advantages like smaller incision and minimal pain .All laparoscopic surgeries should be done by experienced surgeons to avoid major complications .

In Atul K et al [6] studies , 5 patients presented with PSI and the same patients were treated. They concluded that proper sterilization of instruments is the most crucial step in prevention of PSI. Mir et al studied PSI after elective laparoscopic cholecystectomy , incidence of PSI was 6.7 % and the cause of PSI could be due to reusable trocars[7]. Port site infections in our study is 5.7 % . similar type of results obtained in other studies like Shindholimath et al 6.3 % [8] ,colizza et al < 2 % [9] and Den Hoed et al 5.3% [10].

Port site infections can be prevented in the following ways . All the laparoscopic instruments should be dismantled in to parts and each part should be cleaned completely [11]. Apart from this mechanical cleaning best cleaning can be done by ultrasonic technology. Use of ethylene oxide sterilisation gives better results when compared with glutaraldehyde sterilisation. Svetlikova Z et al [12]studies showed that atypical mycobacteria were showing increased resistance to these chemicals due to defects in porin expression in the bacterial cell walls.

High level of disinfection can be achieved by using the chemical sterilants in higher concentration (3-4%) and exposure time should be increased to 8 -12 hrs. Use of disposable laparoscopic instruments is the gold standard for prevention of PSI. Combined surgeries like laparoscopic cholecystectomy and laparoscopic hernioplasty can be avoided. PSI is a preventable problem by proper sterilisation of instruments .

### V. Conclusion

PSI is one of the complication of laparoscopic surgery.PSI can be preventable in the following ways by proper sterilisation of laparoscopic instruments. After the surgery , all the instruments should be dismantled completely .Cleaning and washing the instruments should be done under running water. Glutaraldehyde solution should be regularly changed and the minimum immersion time should be above 20 minutes. Lastly , it is recommended to follow proper technique of sterilisation of laparoscopic instruments to prevent PSI.

**Table 1 – Site of PSI**

Port site	PSI
Umbilical	6
LIF	0
Suprapubic	0
Epigastric	0
Palmer's point	0
Total	6

**Table – 2 – Indications of surgery**

Indication	No of cases	PSI
Laparoscopic appendicectomy	57	5
Laparoscopic cholecystectomy	32	1
Laparoscopic hernioplasty	1	0
Laparoscopic hernia repair	1	0
Laparoscopic ovarian cystectomy	3	0
Laparoscopic appendicectomy with ovarian cystectomy	3	0
Diagnostic laparoscopy	6	0
Laparoscopic assisted vaginal hysterectomy	1	0
Total	104	6

**Figure .1 Umbilical PSI**



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