



INCIDENCE OF PRIMARY PORT SITE INFECTION IN LAPAROSCOPIC CHOLECYSTECTOMY AT UMBILICUS VS PERIUMBILICAL AREA

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ABSTRACT

BACKGROUND- Minimal access surgery (MAS) also commonly termed laparoscopic surgery (LS), has gained popularity due to better aesthesia, lesser pain, early ambulation and discharge from the hospital with early return to work. LS, however, has its package of unique complications. One such complication being SSI in the form of port site infection. This study aims at studying the incidence of port site infection between umbilical and periumbilical site as a primary port of insertion in patients undergoing lap cholecystectomy.

METHODS- This study reviewed the correlation of primary port site infection (umbilicus vs paraumbilicus) in 100 patients who had undergone lap cholecystectomy in our institution and the data was analyzed.

RESULTS- Our study observed that out of the total of 100 patients included in this study, 6 patients developed port site infection. The incidence of port site infection in periumbilical group was 8% compared to 4% in umbilical group.

CONCLUSION- This study concludes that the incidence of SSI was comparable between periumbilical and umbilical port site ($P=0.677$).

KEYWORDS : Port Site Infection, Laparoscopic Cholecystectomy, SSI.

INTRODUCTION

Minimal access surgery (MAS) has gained popularity in the recent past due to less pain, better aesthesia and early return to work. Ever since Philips Mouret reported the first laparoscopic cholecystectomy (LS) in 1987, the approach has been adopted for many other surgical procedures including appendectomy, hernia surgery, colonic surgery, gastric surgery, urological and gynaecological surgery^(1,2) This is because of the combination of advancement in technology with the increasing acceptance of MAS by patients, which has led to the expansion of the horizon of LS.

LS, however, has its package of unique complications one being Surgical site infection (SSI) in the form of port site infection (PSI). SSI are infections consequent to the surgery that presents within a month of the operative procedure and are categorized into- (1) Superficial SSIs which involve skin and subcutaneous tissue; (2) Deep SSIs which involve fascia and muscle layers; and (3) Organ/Space SSIs.⁽³⁾ The risk of SSIs increases in patients with steroid usage, diabetes, malnutrition, long preoperative hospital stay, or perioperative blood transfusion.⁽⁴⁾

Umbilical as a primary site of port entry has so many advantages as it has little fat, is thin, is least vascular, fixed to peritoneum; these features allow easy access to the peritoneal cavity with little force required to put the trocar, least chances of portsite bleeding and decreased chances of intraabdominal injury. Apart from these features umbilicus conceals the surgical scar and is cosmetically far better than periumbilical incision. Overall, umbilical incision can produce better results than the periumbilical incision without producing any long-term harm to the patient. But there are few studies in which port site infections are found to be more common in the umbilical port with a higher incidence of superficial SSIs as compared to that of deep SSIs in LS.⁽⁵⁾ In contrary, technique of primary port entry to the peritoneum does not show any difference in umbilical port site infections in patients undergoing laparoscopic cholecystectomy.⁽⁶⁾ So, this study was aimed to study the incidence of primary port site infection in patients undergoing lap cholecystectomy in umbilical vs periumbilical group.

AIM & OBJECTIVES

To study the incidence of surgical site infection at primary port insertion (Umbilical vs. Periumbilical) for patients undergoing lap cholecystectomy.

MATERIAL AND METHODS

The study was conducted in the Department of General Surgery, Dr. RGMC, Hamirpur consisting of patients of cholelithiasis who underwent elective laparoscopic cholecystectomy by two different methods of primary port entry 1) umbilical 2) periumbilical. All patients undergoing laparoscopic cholecystectomy (except diabetic and immunocompromised states) were included in this study. Patients were given betadine scrub bath (with specific instruction to clean umbilicus) in the morning on the day of surgery and Inj Ceftriaxone (1gm) 30 min before surgery. Betadine 7.5% three coats were given prior to incision at the time of surgery. Umbilical incision port was put through open technique under direct vision. Periumbilical incision port was put through closed technique (after creating pneumoperitoneum with Veress needle). In patients in which there was bile spillage or empyema were excluded from the study. Gall bladder was extracted through epigastric port. Primary dressing was replaced by band-aid (medicated sticking) on 2nd post operative day and patients were followed up for primary port site SSI at the time of discharge from hospital, eight day (on which stitches/clips were removed) and thirty days after surgery. PSI if noticed was classified according to Southampton scoring system.

Statistical Analysis

Categorical variables between the groups were analyzed using Chi square test of Fisher exact test & 'p' value of <0.05 was considered significant. Statistical analysis was performed using SPSS v21.

Conflict of Interest

None

OBSERVATIONS & RESULTS-

1. Patients were divided in two groups with 50 patients each, umbilical and paraumbilical, depending upon the primary site of port of insertion.

TABLE 1: GROUP-BASED DISTRIBUTION OF PATIENTS

	Periumbilical	Umbilical	Total
N	50	50	100
%	50%	50%	100%

2. Incidence of SSI

Our study observed that overall incidence of port site infection was 6%. Out of 50 patients in periumbilical group, 4

patients(8%) had PSI, whereas in patients in umbilical group, 2 patients(4%) had PSI. The incidence of SSI was comparable between periumbilical and umbilical port site (P=0.677).

TABLE 2: INCIDENCE OF SSI

	Periumbilical (n=50)	Umbilical (n=50)	Total (n=100)	'p' value
At Hospital	0	0	0	-
Till 8th Day	4 (8%)	2 (4%)	6 (6%)	0.677
On 30th Day	0	0	0	-



IMAGE SHOWING UMBILICAL PORT INSERTION BY OPEN TECHNIQUE



IMAGE SHOWING PERIUMBILICAL INCISION



IMAGE SHOWING PERIUMBILICAL INCISION SSI



IMAGE SHOWING UMBILICAL INCISION



IMAGE SHOWING UMBILICAL INCISION SSI

DISCUSSION

In our study, incidence of SSI in periumbilical incision was 8%, incidence of SSI in umbilical incision was 4% and overall incidence of SSI was 6% in laparoscopic cholecystectomy. The difference between both groups was not significant. All of the cases with SSI were superficial, i.e., grade I according to Southampton scoring system for SSI. Study done by Sharples et al⁽⁷⁾ in 2010 concluded that the incidence SSI at umbilical site is significantly higher as compare to periumbilical incision in laparoscopic colorectal surgery which is in contrast to our results. A study done by Imamura et al⁽⁸⁾ in 2013 showed that none of the patients undergoing laparoscopic colorectal surgery by transumbilical incision (50 patients) or paraumbilical incision (50 patients), developed SSI postoperatively. This study results are in partial agreement with our study as the incidence of SSI was low in our study and also no significant difference between both groups with respect to SSI was observed. Similarly study conducted by Lee et al⁽⁹⁾ in 2016 and Bouffard-Cloutier et al⁽¹⁰⁾ in 2017 concluded

that the incidence of SSI was comparable between transumbilical incision and periumbilical incision which supports the results of our study.

Kleeff et al⁽¹¹⁾ in 2015 concluded that at least in abdominal surgery, the vast majority of SSIs are caused by intraabdominal contamination rather than skin flora. A study done by Tschudin-Sutter et al⁽¹²⁾ in 2012 concluded that residual bacteria before incision were completely unrelated to the incidence of SSI. The technique of primary port entry to the peritoneum does not show any difference in umbilical PSIs in patients undergoing laparoscopic cholecystectomy as shown by Molloy et al.⁽⁶⁾ Jan et al⁽¹³⁾ in his study concluded that laparoscopic cholecystectomy is associated with a low risk of PSI, which in most cases is only superficial and responds to local measures. It is most commonly the trocar site of gall bladder extraction that is infected. Study done by Sharples et al⁽⁷⁾ in 2010 preoperative skin cleansing of umbilicus reduced umbilical infection rates significantly from 23.5% to 11.6% (p=0.01).

A study conducted by Lee and Hong⁽⁹⁾ concluded that 3% patients had SSI in periumbilical group and nil had SSI in umbilical group in patients undergoing laparoscopic cholecystectomy, but the difference was not significant (p=0.496). In contrast, study done by Siribumrungwong et al⁽¹⁴⁾ concluded that SSI rate was much higher in umbilical than infraumbilical group, i.e. 16% vs. 4%.

Al-Naser N⁽¹⁵⁾ concluded that there was a significant association of port site infection with spillage of bile, stones, or pus, with the port of gallbladder extraction and with acute cholecystitis. Usman et al⁽¹⁶⁾ studied the frequency of port-site infection in patients undergoing lap cholecystectomy and infection is most commonly seen at port site through which gall bladder was extracted.

CONCLUSION

In our study, the incidence of surgical site infection in umbilical incision(4%) after primary port insertion in patients undergoing laparoscopic cholecystectomy was comparable to incidence of surgical site infection in periumbilical incision(8%) with a 'p' value of 0.677. Hence, umbilical incision can be used safely without the increased risk of surgical site infection and potential benefits of umbilical incision in laparoscopic surgery can be increasingly exploited.

ANNEXURE 1

SOUTHAMPTON WOUND SCORING SYSTEM

GRADE	APPEARANCE
0	NORMAL HEALING
I	NORMAL HEALING WITH BRUISING OR ERYTHEMA
A	SOME BRUISING
B	CONSIDERABLE BRUISING
C	MILD ERYTHEMA
II	ERYTHEMA PLUS OTHER SIGNS OF INFLAMMATION
A	AT ONE POINT
B	AROUND THE SUTURE
C	ALONG WOUND
D	AROUND WOUND
III	CLEAR OR HEMOSEROUS DISCHARGE
A	AT ONE POINT (<2CM)
B	ALONG WOUND (>2CM)
C	LARGE VOLUME
D	PROLONGED (>3 DAYS)
IV	PUS

- A AT ONE POINT ONLY(<2CM)
 B ALONG WOUND(>2CM)
- V DEEP OR SEVERE WOUND INFECTION WITH OR WITHOUT TISSUE BREAKDOWN; HEMATOMA REQUIRING ASPIRATION.

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