

PORT SITE INFECTION PREVENTION IN LAPROSCOPIC CHOLEYSTECTOMY USING TROCARS DIPPED IN 10% POVIDINE-IODINE SOLUTIONRajneesh Kumar¹, Ankur Hastir², M. K. Bandlish³**HOW TO CITE THIS ARTICLE:**

Rajneesh Kumar, Ankur Hastir, M. K. Bandlish. "Port Site Infection Prevention in Laparoscopic Cholecystectomy Using Trocars Dipped in 10% Povidine-Iodine Solution". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 15, February 19; Page: 2493-2498, DOI: 10.14260/jemds/2015/359

ABSTRACT: Port site infection is a frequent problem encountered in patients undergoing laparoscopic surgery. The milestone which minimal invasive surgery achieved since its inception is that laparoscopic Cholecystectomy has become gold standard. Umbilical port site infection during cholecystectomy is reported to be 9%,^(1,2) even for difficult cholecystectomy.⁽³⁾ The role of topical antibiotic prophylaxis is particularly useful in prevention of local infection in all patients especially those taking immunosuppressive drugs, uncontrolled diabetic patients, and others. In the literature, no data shows differences in umbilical port site infections in Lap. Cholecystectomies who undergo different techniques of peritoneal access: Hasson, Veress, and others.^(4,5) However, the incidence of port site complications has shown a proportional risk with the increase in size of port size incision & trocar^(6,7) Surgical site infection is because of microbial contamination of the surgical wound. The microorganisms may originate from either endogenous or exogenous sources. Sources of endogenous flora include the patient's skin, mucous membranes or hollow viscera. Exogenous flora originate from any contaminated items on the sterile surgical field including, surgical team members, instruments, air, or material⁽⁸⁾ In this study, we concentrated on the management and prevention of laparoscopic port site infection. The aim of this study was to evaluate the use of Trocars & Stillets soaked in 10% topical povidone-iodine solution for prevention/lowering of laparoscopic port site infections.

KEYWORDS: Port site infection, trocars, cholecystectomy.

INTRODUCTION: Laparoscopic techniques have revolutionized the field of surgery. Benefits include decreased post-operative pain, quicker return to normal activity & less post-operative complications. But, laparoscopic procedures often lead to both intrinsic and extrinsic infections. These infections have thus been a source of significant morbidity for patients recovering from laparoscopic surgeries.⁽⁹⁾ Proper sterilization of laparoscopic instruments is essential to prevent the occurrence of post laparoscopic wound infections with atypical mycobacterium.⁽¹⁰⁾ Laparoscopic cholecystectomies are associated with shorter hospital stay & convalescence, less pain and scarring and lower rates of post-operative surgical site infections than Open choleystectomies.⁽¹¹⁻¹⁴⁾ One of the complications is port site infection at that port from which gall bladder is delivered.

The aim of this study was to decrease morbidity associated with the port site infection in laparoscopic surgery.

MATERIAL & METHODS: The study included 160 patients with gall stones undergone laparoscopic cholecystectomy at civil hospital, Jalandhar from May, 2011 to Sept, 2012 and from Sept, 2012 to Jan, 2014 at Punjab Institute of medical sciences (PIMS) Jalandhar. Of this, 160 patients were enrolled the study includes 118 patients females and 42 males with the mean age of 45 yrs (range 8yrs-65yrs).

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Povidone-Iodine (Betadine) a complex of Iodine, the bactericidal component, with polyvinylpyrrolidone (Povidone), a synthetic polymer. The most common commercial form is a 10% solution in water yielding 1% available Iodine. Povidone-iodine is available as a surgical scrub or skin cleanser with a detergent base (0.75% available iodine) is most commonly used antimicrobial agent.

We used trocars & stillete dipped in 10% Povidone-Iodine solu. before introduction into the abdomen after topically cleaning the operative area with povidone-iodine.

We evaluated the results of topical povidone-iodine on the series of patients which excluded patients with added risk of infection. Therefore, we excluded in this study patients with pre operative clinical conditions that might predispose to the development of port site infection. These high risk cases were Acute cholecystitis with localized peritonitis, Umbilical hernia, Immunosuppressed patients (Patients with chronic debilitating illness & with known malignancies), Diabetics, Perforation of gall bladder during removal through epigastric port, Perforation of gall bladder in peritoneum during lap. Cholecystectomy, Conversion to open cholecystectomy.

Procedure of Laparoscopic cholecystectomy was carried out in all the patients after taking a detailed history, general physical examination followed by routine investigations.

The enrolled patients were randomized into 2 groups The first group (povidone-Iodine group) where trocars were immersed/dipped in Povidone- iodine 10% sol. before introduction into abdomen (80 Patients) and 2nd group (control group) was without Povidone-Iodine (80 patients) dipped/soaked trocars.

This protocol aimed at the controls & for the evaluation only of local infections, So, for all patients we applied similar prophylactic systemic antibiotic protocol used in our institution by means of intravenous administration of 1gm ceftriaxone intraoperative dose & 2nd 3rd dose of 1gm ceftriaxone after 12 hours gap. All the patients received 1gm of ceftriaxone I/V dose just before induction of anesthesia. Lap. Cholecystectomy was performed with standard four port technique. The gall bladder was extracted through epigastric port.

The protocol for all povidone- iodine group patients pre operative preparation of abdominal wall: Disinfect of the umbilical & periumbilical skin with povidone- iodine: Three coats.

Apply povidone-Iodine over all four trocars and their stillets.



FIGURE 1

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Intra-operative Phase: After gall bladder removal through epigastric port all patients under went: Suture of umbilical & epigastric access-of muscular fascia & of the skin wound with Vicryl 0. Suture of other 5 mm port with vicryl / Ethilone. All port sites were cleaned with 0.9% saline solution before suturing.

Post operative evaluation of patient in relation to the signs of local infection was executed on the 3rd 5th & 7th post op. days. These patients were discharged after 48 hours & asked to come for follow up on 5th at 7th days. The patients were examined to rule out any infective complication at port site.

The evaluated parameters were as follow: -

1. Umbilical/Epigastric pain (Pain scale 0 to5)
2. Analgesic drug administration for localized pain
3. Signs of inflammation
4. Purulent leakage from wound
5. Dehiscence of skin sutures

Protocol for control group patients (called control protocol) had the same phase as the above mentioned protocol. But povidone- iodine was not applied to trocars. The data was analyzed.

RESULTS: 80 Patients were randomized into two groups A & B Both groups were homogenous for age, sex, duration of surgery, post operative stay.

One patient of group A developed wound infection that too superficial wound infection at epigastric port site which responded to dressings & oral antibiotics.

6 Patients of group B developed wound infection:

2 Cases superficial wound infection (Redness)

1 Case Purulent discharge from epigastric port

1 case purulent discharge from umbilical port

2 case wound dehescence one in umbilical port one in epigastric port.

Characteristics	Group A	Group B (Control)	P values
Age	46.02+_ 10.79	45.06_+ 12.18	>0.10
Sex	20/60	22/58	>0.10
Duration of surgery (Min)	51.60+_ 10.48	52.20+_ 12.40	>0.10
Preoperative and intraoperative data & General outcome			

The main result of this study is that topical application of povidone-iodine to trocars & stilette has reduced the incidence of port site infection in laparoscopic surgery, a finding that is statistically significant. In addition, the patient comfort was enhanced in the providone-iodine group compared with the control group. Systemic prophylactic antibiotic therapy in laparoscopic cholecystectomy maintains its usual role.⁽¹⁵⁻¹⁶⁾ Topical antiseptic prophylaxis was efficacious in reducing port site infections, but its use is not meant to replace systemic antibiotic prophylaxis. Rather, its use is to serve as an adjunct to systemic antibiotic prophylaxis so that the usual antibiotic protocol is not changed (i.e. short and ultra short-term antibiotic therapy).

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Patients in the povidone- iodine group had minor post operative morbidity rather no morbidity caused by port site infection.

The cost of the use of povidone-iodine in intra operative lap cholecystectomy for the ambulatory treatment of a post operative wound infection.

Moreover, less force is required to introduce trocars into abdomen & continuous antisepsis is there over the musculofascial & skin surface adjacent to trocars, where pressure necrosis is there if surgery is prolonged.

The reduction of port site infection with prophylactic povidone-Iodine sol. is cost effective. Patients can resume work sooner and ambulatory management requires less commitment in terms of human resources (Physicians, nurses & Medical material).

In literature, reports the use of several methods to reduce the incidence of post cholecystectomy port site infection, such as role of topical antibiotic therapy (Rifamycin)⁽¹⁷⁾ & Such as specimen removal by means of endobags⁽¹⁵⁾

DISCUSSION: Port site complications can be grouped into access related complications and postoperative complications have been reported in all ages, groups & both genders. Literature shows that obesity is associated with increased morbidity related to port site due to various factors like longer trocars, thick abdominal wall so fascia closure is recommended for ports >_10 mm, the fascia are closed with sutures to reduce the risk of developing port site hernia.⁽¹⁸⁾ Umbilical port site was the most common site of infection followed by epigastric port site.⁽¹⁹⁾ In the literature, there is great emphasis on the increased frequency of umbilical port site hernia and the role of umbilical flora in the development of port site infection. Emphasis is also there on the increased frequency of port site infection th. epigastric port as all gall bladder specimens in cholecystectomy were removed through the epigastric port. Wound infection can be prevented by use of specimen bags during specimen extraction. The presence of significant Peri-incisional erythema, wound discharge and fever may indicate the presence of a `necrotizing fascial infection.⁽²⁰⁾ The incidence of port site infection was 1.8%.⁽²¹⁾ Den hoed et al. found the incidence to be 5.3%.⁽²²⁾ Shindholimath et.al 6.3%.⁽²³⁾ and Colizza et.al. < 2 %.⁽¹⁵⁾ All port site infections were superficial involving only the skin & subcutaneous tissue. Superficial skin infection is more common. Our results are comparable with many other studies.

Since the discovery of the natural element Iodine in 1811 by Chemist Bernard Courtas, iodine and its compounds have been broadly used for prevention of infection and treatment of wounds. However, molecular iodine can be very toxic to tissues, so formulations composed by combination of iodine with a carrier that decreases iodine availability were developed. Povidone-Iodine results from combination of molecular iodine and Polyvinylpyrrolidone.

CONCLUSION: Port site infection is a problem faced by laparoscopic surgeons in developing countries which is preventable through proper sterilization. In this study, we used a simple economic way to treat and significantly reduce the incidence of post Lap. Cholecystectomy port site infection. The data gathered showed positive & statistically significant results in favour of povidone- iodine application over trocars before introduction into abdomen.

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