

EVALUATION OF PORT SITE INFECTION FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY IN A GOVERNMENT TEACHING HOSPITAL

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ABSTRACT

BACKGROUND

The objectives of this study were to evaluate the frequency of port site infection following laparoscopic cholecystectomy, its prevention and its management. With the passage of time, laparoscopic cholecystectomy has revolutionized the ease of management of cholecystitis and associated gallbladder disease, but has been associated with catastrophic complication of port site infection.

MATERIALS AND METHODS

400 cases of laparoscopic cholecystectomy were done at Dept. of surgery, Nalanda Medical College, Patna between March 2012 and 2018 (Feb) and were analysed for port site infection. Culture sensitivity was done for all patients who developed port site infection. Variables like port sites, port size, duration of operation time were evaluated. A search was also made for nontuberculous mycobacterium.

RESULTS

Out of 400 cases, 30 cases (7.5%) developed Port Site Infection. Out of these 15 cases (3.7%) had superficial infection while 12 cases (3%) had deep surgical infection. Five cases developed sinus formation due to (i). Retained necrotic foreign material and (ii). Infected suture material. Three cases developed nonhealing sinus which finally healed after treatment for Atypical Nontuberculous mycobacterium. 70% of cases of Port Site Infection developed at epigastric port, the port from which Gallbladder was taken out. In 95% of cases port site infection occurred in port size 10 mm or more.

CONCLUSION

Port site infection is more at the port from which Gallbladder is retrieved. Almost always occurred in port size of more than 10 mm size. Improved surgical training has resulted in decreased number of catastrophic complications of laparoscopic cholecystectomy. But has not impacted significantly on incidence of P.S. Infection.

KEYWORDS

Laparoscopic Cholecystectomy (L.C.) P.S.I. (Port Site Infection), Minimally Access Surgery (MAS).

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BACKGROUND

1st documented Laparoscopic cholecystectomy was performed by ERICH MUHE in Germany in 1985. 1st L.C. using video technique is credited to Phillipe Mouret of France (LYONS).¹

Laparoscopic cholecystectomy has revolutionized the surgical management of gall stone disease and soon became a tremendous success as mortality and morbidity rates were less or comparable to open procedure. The improved postoperative comfort and shorter convalescence made Minimally Access Surgery (M.A.S) a procedure of choice.

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In, M.A.S., surgical therapeutic goal was achieved with minimal somatic and psychological trauma. Its use spread rapidly between 1990 and 1994.²

With the passage of time there were advances both in advanced quality of instruments and number of highly trained surgeons. All these lead to worldwide acceptability of M.A.A. In the hands of highly trained surgeons, urgent and catastrophic complications like injury to retroperitoneal great vessels, intestine injury and injury to bile duct are almost negligible these days but chronic complications like.³

1. Infection with Atypical Mycobacterium and sinus.
2. Port Site Hernia
3. Biliary stenosis – late appearance of bile duct injury also from burn injury from cautery.
4. Intraabdominal complications,
 - a. Abscess in the usual recesses of the peritoneal cavity.
 - b. Bilioma.
 - c. Late acute bowel obstruction.

Aims and Objectives

Evaluation of frequency of port site infection following laparoscopic cholecystectomy.

MATERIALS AND METHODS

In this study, we have included 409 of L. cholecystectomy done at Dept. of Surgery, Nalanda Medical College and Hospital, Patna, between March 2012 and Feb 2018 and were analysed for Port Site Infection.

All the cases were monitored for P.S.I. using standard. National Nosocomial Infection Surveillance (NNIS) System definition for surgical site infection given by the Centre for Disease Control and Prevention (CDC).⁴

Classification of Surgical Site Infection (SSI) includes incisional which may be (i) Superficial involving only skin and subcutaneous tissue or (ii) Deep involving fascia and muscle or (iii) Organ/space infection, organ and space S.S.I. involves any part of body excluding the skin incision, fascia or muscle layer that is opened or manipulated during operative procedure.^{5,6}

Out of 409 cases of Laparoscopic cholecystectomy which were analysed for P.S.I., nine cases were converted to open cholecystectomy of these six cases were converted due to encounter with Mirizzi type III, IV & V cases due to Bile duct injury and these nine cases were excluded from our study. All cases were given preoperative Ceftriaxone (1 gm) at the time of induction of anaesthesia and followed by one vial more after 12 hrs. Most of the patients were discharged on 2nd or 3rd postoperative day after wound inspection. Wounds were again examined on 7th postoperative day and if infected every third day till healing of wound. Proper wound toileting and oral antibiotics were used empirically or based on culture and sensitivity. Study of P.S. Infections were studied in relation to frequency, Depth and extent of infections, operative time and operative findings and port size and site.

Culture of Atypical/Nontuberculous Mycobacterium was carried out for non-healing sinuses of longer duration.

RESULTS

Out of 400 cases thirty cases developed some form of port site infections (7.5%). Out of these thirty cases fifteen (3.7%) cases had superficial infection while 12 (3%) cases had Deep Surgical Site Infection. Five cases (1.2%) developed Sinus formation due to (i). Retained stone (ii). Retained Necrotic materials and (iii). Infected suture material.

Two cases developed Non-healing sinus which were explored twice and finally healed after treatment for Nontuberculous Mycobacterium. In 70% of cases Port Site Infections developed at epigastric port, the port from which Gallbladder was retrieved. 25% P.S.I. occurred at the umbilical port. 95% case of P.S.I. occurred in Port size > 10 mm.

DISCUSSION

Any surgical procedure either open or Laparoscopic will have some complications. Laparoscopic cholecystectomy has become Gold standard treatment for Gall stones. As the learning curve of surgeons and paramedical staffs involved in laparoscopic surgery improved dreaded complications like injury to Great retroperitoneal vessels, Injury to intestine and trauma to Biliary duct has come down significantly. Despite improvement in Quality of Laparoscopic surgical Instruments and proper sterilization of instruments, also improved level of surgical training and technique certain complications occur frequently these are Port Site Infections, Port Site Hernia and Biliary stenosis.^{7,8}

Elimination of surgical site Infection is unavoidable. Goal of prophylactic antibiotic usage is to reduce the incidence of surgical site infection. Role of prophylactic antibiotic is still controversial in literature.

*Factors and Conditions Favouring Port Site Infection**a) Preoperative*

- Proper antibiotic selection with aim to reduce incidence of surgical site infection.^{9,10}
- Proper selection of patients: - Laparoscopic cholecystectomy should be avoided in suspected cases of Mirizzi syndrome type III, IV & V.¹¹
- Patients with co-morbidity like obesity, Advance age, Malnutrition, established infection in the abdomen or abdominal wall, Immunocompromised patients of whatever cause (Diabetes, Chemotherapy, Steroid, Human immunodeficiency Virus (HIV infection) etc.
- Improper sterilization of instruments and preparation of port (Abd).¹²

b) Complications of Laparoscopic Access

- Port Site infection is common in Trocar size >10 mm.¹³
- Haematoma formation due to injury of parietal vessels levels (P.S).¹³

c) Intraoperative

- Longer duration of operation favours P.S.I.
- Tissue factors: Excessive manipulation.
- Contamination of peritoneal cavity from infected bile due to trauma/ perforation of Gallbladder (Acute cholecystitis, Empyema G.B.) during operations.
- Spilled G.B. stone promotes infection, abscess formation or sinus formations.¹⁴

d) Extraction of Gallbladder

- Contamination of Trocar site due to infected bile leaked from traumatised gallbladder during extraction.
- Spilled G.B. stone – gets retained in fascial/muscle/layer of trocar favouring P.S.F. or sinus formation.
- Extension of Trocar Site with improper repair favour P.S.I.

- Post-operative sinus formation was mostly due to spilled stones or necrotic material retained in Trocar site.

CONCLUSION

- I. Recommended sterilization protocol and proper clearing of laparoscopic instruments should be strictly followed to limit P.S.I. Contamination of instruments with atypical mycobacterium/Non-tuberculous mycobacterium has been reported. In our study, we also found two cases of non-healing sinus which was finally cured after treatment with second line anti tuberculous drug. So, culture and search for non-tuberculous mycobacterium should be made in suspected cases.¹⁵
- II. Higher level of trained surgeon favour decreases in P.S.I. learning curve improves with number of cases done by surgeons.
- III. Larger Port or extension of port favour P.S.I. – so it should be properly repaired. Smaller Port Site.
- IV. Distended & Inflamed Gallbladder,
 - i. Should be decompressed to avoid perforation of G.B. during dissection or during manipulation through port.
 - ii. If contamination of port occurs or there is spilled G.B. by stones, then thorough wound toileting should be done.
 - iii. Retrieval endobags for G.B. or spilled stones decreases incidence of P.S.I. – as reported in many series.

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