

**Chronic Port Site discharging sinus following Laparoscopic Cholecystectomy: An  
experience of 5 years at a tertiary health care centre**

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**Abstract**

**Background:** Laparoscopy has replaced the open technique in the majority of cholecystectomy surgeries. However laparoscopic surgeries are associated with some of its own set of complications amongst which one of the most bothersome is chronic port site infection. It adds to the morbidity of the patient and also undermines the benefit of laparoscopic surgery. Infection with rapidly growing atypical mycobacteria having multidrug resistance is frequently encountered in many of these patients. This study focuses on the clinical diagnosis, management, and prevention of this problem at a tertiary centre.

**Material and methods:** This study has been done in 40 patients who suffered from chronic port site infection over a period of 5 years in a tertiary care centre.

**Result:** Majority of the patients presented 4 weeks after laparoscopic surgery with a discharging sinus. Altogether 19 patients (48%) completely responded with prolonged fluoroquinolone for 6-8 weeks without any surgical intervention. Anti-tubercular therapy was given in 15 patients (37%) and surgical debridement followed by fluoroquinolone and antitubercular therapy for 6-9 months was given in 6 patients (15%).

**Conclusion:** Chronic port site infection is a rare preventable complication if appropriate measures are taken preoperatively, intraoperatively and postoperatively. It can often be treated non-surgically, with early identification and appropriate management. It can be best avoided by proper sterilization techniques of the laparoscopic instruments with appropriate sterilizing agent for appropriate time.

Keywords: Laparoscopic cholecystectomy; Atypical mycobacterial infection, discharging sinus, anti-tubercular therapy.

### **Introduction**

Laparoscopic cholecystectomy has replaced the open cholecystectomy as the “gold standard” procedure for symptomatic gallstone disease due to its several advantages which include less pain, early return to work, better cosmesis and less chances of incisional hernia.<sup>1</sup>

This technique is not free of complications and surgeons are now facing quite different set of complications which were not there in the conventional open technique. Traumatic injuries due to veress needle, trocar and laparoscopic instruments, heat injury by diathermy due to coupling or inadvertent contact with viscera and port related complications like infection need a substantial training especially from young surgeons.<sup>2</sup>

Port Site infection is of two types. The first type occurs immediately within 1 week of laparoscopic surgery due to gram negative or positive bacteria. It usually subsides in few days with dressing and antibiotics. The second type of infection i.e Chronic port site infection (PSI) usually occurs 3-4 weeks after the surgery when wound healing has occurred. It is usually caused by atypical mycobacteria which includes the group of mycobacterial species that is not part of the M. tuberculosis complex having an incubation period of 3 to 4 weeks which do not respond to common antibiotics.<sup>3</sup>

Chronic port site infection (PSI) is one the most worrisome complication for patients after laparoscopic surgeries. The incidence of chronic PSI as reported in literature is around 1.4-6.7%.<sup>4</sup> In the recent years, Atypical Mycobacteria (ATM) has emerged as an important opportunistic pathogen. ATM has been known to colonize tap water, natural waters, and soil and hence can easily contaminate solutions used in hospital settings.<sup>5</sup> These microorganisms do not respond to first-line anti-tuberculosis drugs. Thus, the standard treatment consists of combinations of second-line anti-tubercular drugs including macrolides such as clarithromycin, fluoroquinolones such as Levofloxacin or moxifloxacin, tetracyclines such as doxycycline, and aminoglycosides.<sup>6</sup> Improper sterilization of laparoscopic instruments is responsible for such infections and makes it a problem mainly affecting developing countries, such as India. Thus, proper sterilization of such instruments

is essential to prevent the occurrence of post-laparoscopic wound infections with atypical mycobacteria.

There are five clinical stages of Chronic port site infections (PSI)<sup>7</sup>

**First stage:** A tender nodule appears in the vicinity of the port site, and its usual timing of appearance is around four weeks following the surgery.

**Second stage:** Increase in the size of the nodule, and increased tenderness of the site along with other signs of inflammation with eventual formation of an abscess.

**Third stage:** Reduced pain sensation following discharge of the purulent material and necrosis of the skin surrounding the port site.

**Fourth stage:** Chronic sinus discharging white or serous fluid.

**Fifth stage:** Hyper-pigmentation of the skin surrounding the sinus and the appearance of multiple nodules at different places.

### **Materials and Methods**

40 patients (Female =32 and Male =08) who had all undergone standard four port laparoscopic cholecystectomy and presented with symptoms of port site infection in the form of abscess at port site or chronic discharging sinus 3-4 weeks after the surgery were included in the study. Laparoscopic cholecystectomy was done at some other hospital in 34 patients and 6 patients who developed Chronic PSI were operated at our centre. At the time of discharge and suture removal, none of the 6 patients who were operated at our centre showed any signs of local wound infection or any systemic signs of sepsis.

Ultrasound scans showed no evidence of intra-abdominal collection or bile leak. The blood test of these patients showed normal white blood cell and differential count thus confirming the absence of systemic infection. The culture of the pus collected from the wound site was found to be negative for gram-positive and gram-negative bacteria.

### **Results**

Among the 40 patients, 32 were female (80%) and 8 were male (20%). Mean age of presentation was 28 years with youngest patient of 22 years and oldest was 56 years of age. Out of 40 patients, 3 patients were known case of type 2 diabetes mellitus (7.5%). Total 6 patients out of 40 were operated at our centre and 34 were operated in private hospitals.

Chronic PSI infection occurred at epigastric port in all of the 40 patients. 3 patients had involvement of umbilical port besides epigastric port. In 2 patients all the four port sites developed chronic PSI.

**Table 1: Ports affected by Chronic PSI**

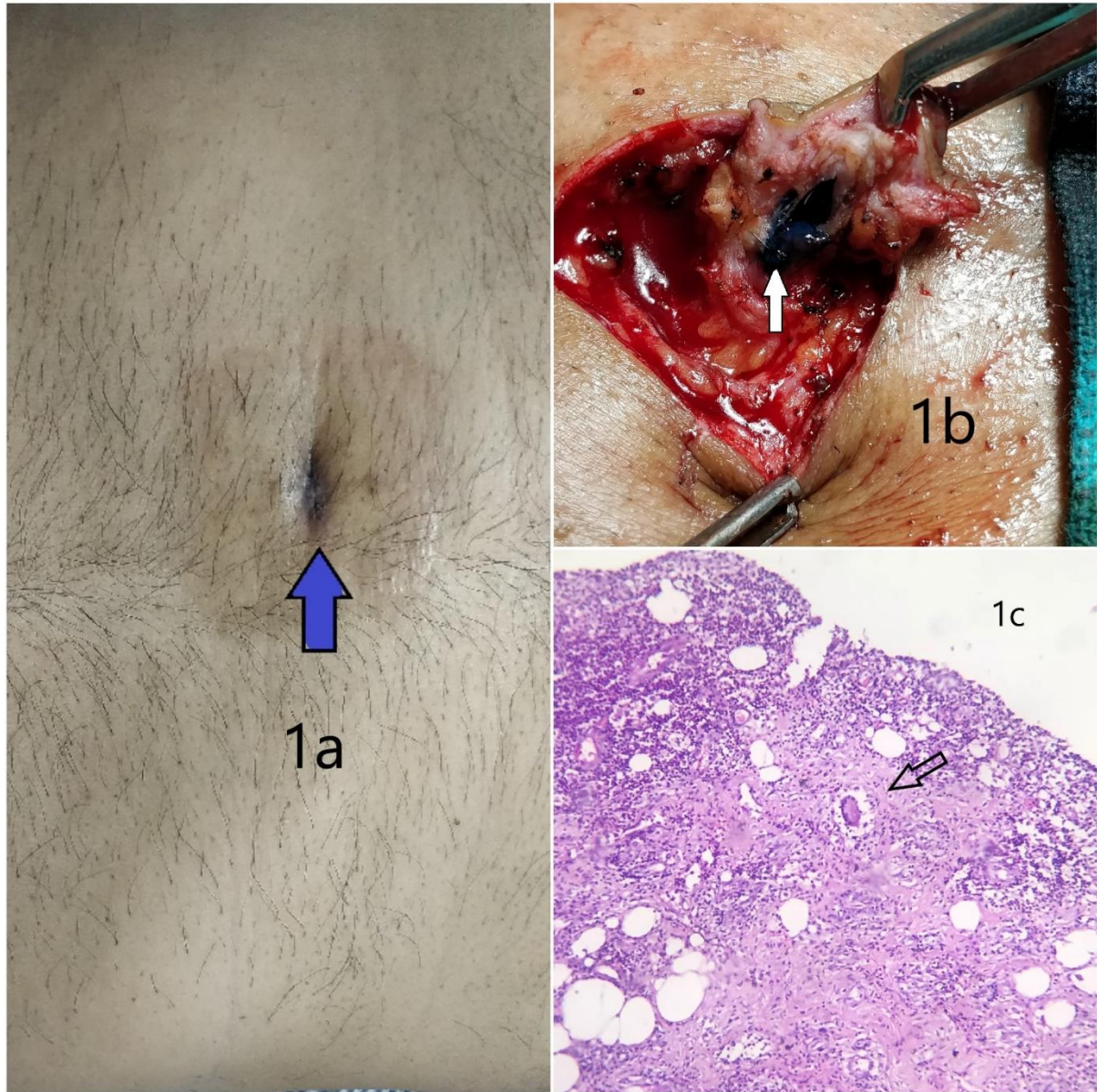
<b>Port affected</b>	<b>Number of patients</b>
Epigastric Port alone	35
Epigstric port with umbilical port	3
All four ports	2

We analyzed the results and found that all the patients had more or less similar clinical presentation: delayed onset of wound infection (3-4 weeks after surgery), erythematous and thickened skin, discharging sinus and absence of systemic illness (**Fig 1**). The cultures were negative for gram positive and gram negative bacteria as well as fungi. All the patients were treated initially with oral moxifloxacin 400mg once daily. Out of 40, 19 (48%) patients responded well and they were kept on same treatment for 8 weeks. In 15 patients (37%) who didn't improve with oral moxifloxacin alone ATT was given for 6 months. In 6 patients (15%) in whom debridement with excision of sinus tract was done, we started combination of ATT and moxifloxacin for 6-9 months. The histopathology of the sinus tract showed presence of granulomas (**Fig 1,2,3**). Patients were followed up for 3 months after completion of treatment and none of the patient showed any sign of recurrence.

**Table 2: Treatment given to the patients of Chronic PSI**

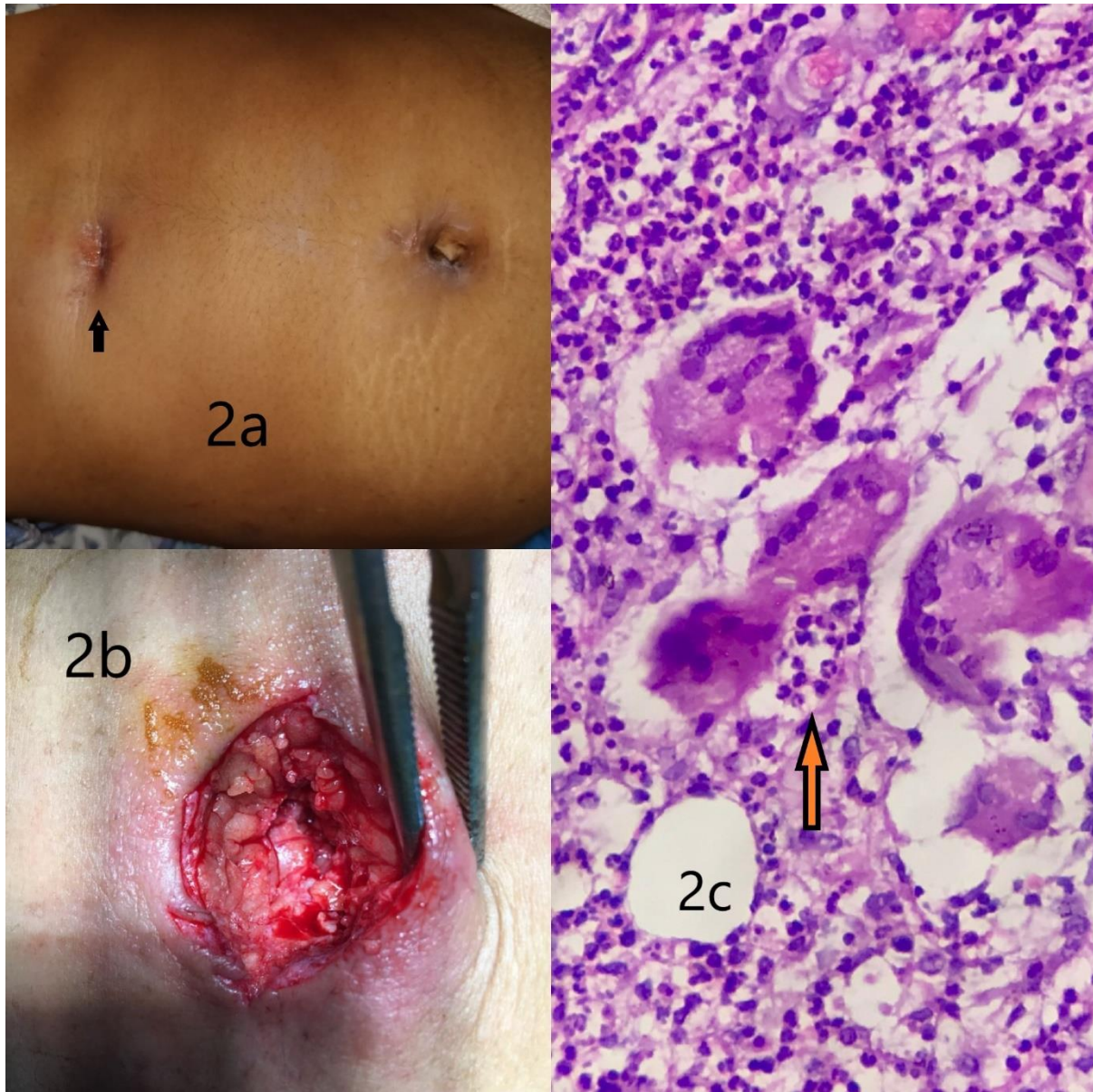
<b>Treatment given</b>	<b>Number Of Patients (Total=40)</b>
Oral Moxifloxacin 400 mg (6-8 weeks)	19

Anti tubercular therapy (ATT) with oral moxifloxacin	15
Surgical debridement followed by Oral Moxifloxacin and ATT	06



- **Fig 1:**
  - **Fig 1a** : Chronic discharging sinus at the epigastric port site (blue arrow)
  - **Fig 1b** : Excised sinus tract (white arrow)

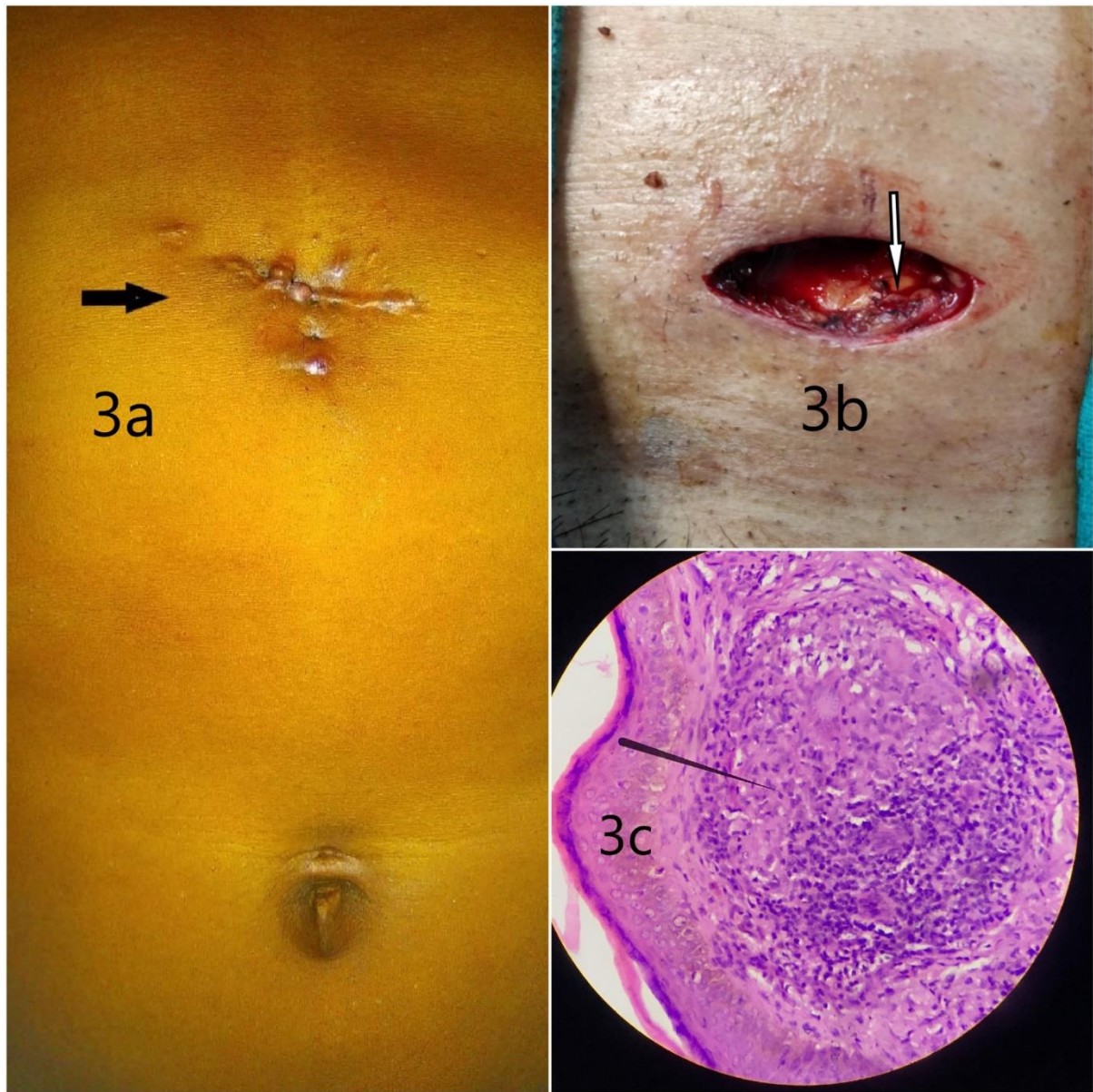
- **Fig 1c** :Granuloma composed of epithelioid cells, lymphocytes and langhans giant cells.(H&E,10X) (black arrow)



- **Fig 2:**

- **Fig 2a** :Discharging sinus at epigastric port (black arrow)
- **Fig 2b** :Opened up cavity after the excision of sinus tract

- **Fig2c:** Epithelioid cells, lymphocytes and langhans giant cells.(H&E,40X) (orange arrow)



- **Fig 3 :**

- **Fig 3a :** Chronic sinus at epigastric port (black arrow)
- **Fig 3b:** Cavity of excised tract (white arrow)
- **Fig 3c:** Well-formed granuloma (black line)

## Discussion

Infection at the port site can present with two types. The first type appears within a week of surgery and is usually caused by gram-positive or gram-negative bacteria. It is acquired from the infected gallbladder or the surgical procedure and can be treated with usual antibiotics and wound dressing. The second type present 3-4 weeks after surgery which is caused by atypical mycobacteria and does not respond to commonly used antibiotics.<sup>3</sup>

Infections with atypical mycobacteria usually occur after laparoscopic procedures and are rarely associated with open procedures. This is because of the fact that instruments used in open surgery are usually autoclaved; unlike the instruments used for laparoscopic surgery that have a layer of insulation that restricts the use of the autoclave in the sterilization process.<sup>8</sup> These instruments are usually washed with tap water which is a good source of atypical mycobacteria and then disinfected by 2.0 - 2.5% glutaraldehyde for atleast 20 minutes.<sup>9</sup>

Also, if these instruments are not properly cleaned before putting them in glutaraldehyde solution the, blood and charred tissue deposits are left. These endospores in the contaminated instrument get deposited in the subcutaneous tissue, which germinates in three to four weeks to produce clinical signs and symptoms.<sup>3</sup> In our study, all 40 cases presented atleast 3-4 weeks after the surgery in different stages of chronic port site infection. Boiled tap water used to clean/wash the instruments after surgery is also considered to be the source of infection. Clarithromycin, moxifloxacin and a combination of Amikacin and Doxycycline have been observed to be effective against atypical mycobacterial infections.<sup>6</sup> In our study, we used oral moxifloxacin in the dosage of 400mg once daily for a minimum of 4 weeks initially. Out of the 40 patients 19 patients (48%) who presented in early stages of infection, responded to oral moxifloxacin which was continued for 8 weeks. In 21 patients who were not responding to moxifloxacin, antitubercular therapy was also started. 6 patients who presented in late stages of infection with multiple discharging sinus required surgical debridement in addition to ATT and oral moxifloxacin.

The hospital must follow certain guidelines to ensure proper sterilization of laparoscopic instruments and other invasive surgical devices. After the surgery, all the parts of the instruments should be dismantled and cleaned with warm normal saline. Higher concentration of glutaraldehyde (3.4%) with an exposure time of at least 8-12 hours achieve the desired level of sporicidal activity. Use of ethylene oxide and plasma sterilizer have shown to be effective in killing



spores.<sup>10</sup> Besides aseptic precautions and proper sterilization of instruments, spillage of bile or gut content in the port site shall be avoided. Use of non-porous specimen retrieval bags for retrieving the specimen and thorough irrigation and cleaning of the port site before wound closure should be done.<sup>11</sup>

## **Conclusion**

Chronic Port Site infection in laparoscopy is a problem faced by laparoscopic surgeons in developing countries. Wound infection 3-4 weeks after the surgery, poor response to antibiotics and persistent pus discharge from port site should raise the suspicion for atypical mycobacterial infections. Proper sterilization techniques and optimum treatment significantly reduce morbidity.

**Conflict of interest:** None of the authors have any conflict of interest to disclose.

**Patient Consent:** Informed and written consent was taken from the patients for publication of manuscript and photographs.

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