

Port Site Tuberculosis after Laparoscopic Cholecystectomy: A Study of 20 Cases.

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ABSTRACT

Background: Atypical mycobacterial port site infection following laparoscopic cholecystectomy has been increasingly recognized in the recent years. As the infection has a protracted course, patients need to be identified early and managed properly for early resolution of the disease. **Methods:** 20 patients presenting with port site infections approximately three weeks after laparoscopic cholecystectomy were incorporated in the study design. Gram staining, culture, biopsy and ultrasonography were obtained selectively. Patients were treated with a combination of clarithromycin and ciprofloxacin and or intralesional amikacin. **Results:** Most of the patients responded to the conservative management. One of the patients was subjected to the surgical excision of the small persistent sinus track; however the biopsy didn't reveal any well-defined track or evidence of granulomatous pathology. All patients required six to nine months of medical therapy and no recurrence was reported at two year follow up. **Conclusion:** Port site tuberculosis after laparoscopic surgery is a known entity. Early diagnosis and proper treatment are prerequisite to the successful outcome. Strict adherence to well established sterilization protocol is a must for the prevention.

Keywords: Atypical Mycobacteria, Laparoscopic Cholecystectomy, Port site, Tuberculosis.

INTRODUCTION

The modern era of laparoscopy started in 1987 when Phillippe Mouret performed the first laparoscopic cholecystectomy.^[1] With advances in the field of laparoscopic surgery more and more of the surgeries are being performed laparoscopically with better results and wide spread acceptance. As the number of surgeries increased, newer subset of complications surfaced.

Port site infection due to non-tuberculosis mycobacterium has been a concern for the laparoscopic surgeons of late as it leads to a protracted morbid state. It washes away all the advantages of the laparoscopic surgery and irritates the surgeon as well as the patient equally due to persistent redundant infection.

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Non tuberculosis mycobacteria are commonly found in soil, water, dust and are known to cause respiratory infections, lymphadenitis, cutaneous lesions and other systemic infections particularly in immunocompromised patients.^[2] Skin and soft tissue infections caused by NTM have been reported after

tattooing, intramuscular injection, liposuction, implant surgery and plastic surgery procedures.^[3]

Being ubiquitous in nature NTM have a propensity to contaminate solutions and disinfectants used in hospital settings. Erroneous sterilization of the laparoscopic instruments has frequently resulted in the hospital out breaks of port site infections following laparoscopic surgery.^[4] Early identification and diagnosis is critical to the successful outcome as these bacteria do not respond to the conventional anti mycobacterial treatment and second line chemotherapy is the foremost management option.^[5] Strict adherence to the recommended sterilization protocol is a must for prevention.

MATERIALS AND METHODS

20 patients presenting with typical port site lesions approximately three weeks after an uneventful laparoscopic surgery were included in the study design.

All the patients had undergone elective laparoscopic cholecystectomy.

No evidence of post operative port site infection in the immediate post operative period was noted in all the patients.

11 patients presented with port site nodular swellings [Figure 1a, 1b], 4 patients presented with port site

discharge [Figures 2a,2b,3a] and 5 patients presented with port site swelling with abscess [Figures 4a, 5]. Patients presenting with nodules were subjected to FNAC; patients presenting with discharge were subjected to gram staining and culture wherever possible and patients presenting with abscess were subjected to aspiration of the abscess cavity along with culture and gram staining.

Patients underwent serial ultrasonography of the port sites to ascertain the extent of the lesions and response to the treatment. All patients were subjected to second line chemotherapy using ciprofloxacin and clarithromycin 500 mg twice daily for a period of 6-9 months. Two patients with redundant disease after two to three months of treatment were treated with intralesional amikacin 500mg once daily for 7days. One patient was subjected to excision of the sinus track.

RESULTS

Most of the patients belonged to the age group of 30-40yrs (60%) and female sex (80%). Out of the eleven patients subjected to the FNAC, ten patients reported granulomatous inflammation and findings of one of the patients was inconclusive. Ultrasonography of these patients revealed limited underlying disease. Out of the four patients presenting with the port site discharge, two had already undergone incision and drainage for port site abscess and were subjected to different antibiotics in the past. The gram staining and the culture of these two patients were negative for acid fast bacilli. Out of the remaining two patients, one revealed AFB on gram staining but culture was positive for atypical mycobacterium (rapid growers) in both the patients. Pertinent to mention here that one of these patients presenting with discharge was operated 15 years ago and had undergone multiple drainage operations for port site abscess in the past [Figure 3a] The ultrasonography of the patient revealed a sinus track extending deep up to the peritoneum [Figure 3b]. All patients presenting with abscess revealed rapid growers (atypical mycobacteria) on culture and gram staining was positive for AFB in two cases. The ultrasonography of these patients also revealed complex sinus tracks extending up to the peritoneum [Figure 3b, 6a, 6b], however no intraperitoneal extension was noted.

All patients responded well to the second line chemotherapy with a minimum period of six months and a maximum period of nine months approximately. The nodular swellings responded either by progressive decrease in size to complete regression or by spontaneous bursting of the nodules leading to the resolution [Figure 1a and 1c]. The patients presenting with discharge or abscess responded by regression of the discharge and progressive decrease in the size of the abscess cavity to complete resolution [Figure 4a, 4b, 4c]. Serial

ultrasonography revealed progressive shrinking of the sinus tracks leading to complete extinction. The time taken by the two patients receiving intralesional amikacin was approximately eight months which was similar to other patients. The histopathology of the patient who was subjected to surgical excision of the small redundant sinus track didn't reveal any evidence of granulomatous pathology.

No feature of any drug related complication was noted and all patients tolerated the medication well. At a minimum follow of two years no evidence of recurrence of the disease was noted.



Figure 1a: Nodular swelling above and to the left of umbilical port.



Figure 1b: Nodular swelling at the lateral port site.



Figure 1c: Bursting nodule (shown in fig 1a) with signs of regression.



Figure 2a: Epigastric port site discharge.



Figure 4a: Umbilical port site abscess.



Figure 2b: Epigastric port site discharge.



Figure 4b: Resolving abscess (shown in fig 4a) post chemotherapy.



Figure 3a: Figure showing multiple scars with discharge, adjoining epigastric port site.



Figure 4c: Complete resolution of the abscess (shown in fig 4a), only superficial scars seen.



Figure 3b: Underlying sinus track in the subcutaneous tissue of the patient (seen in fig 3a).



Figure 5: Lateral port site abscess.



Figure 6a: Complex underlying port site sinus track.

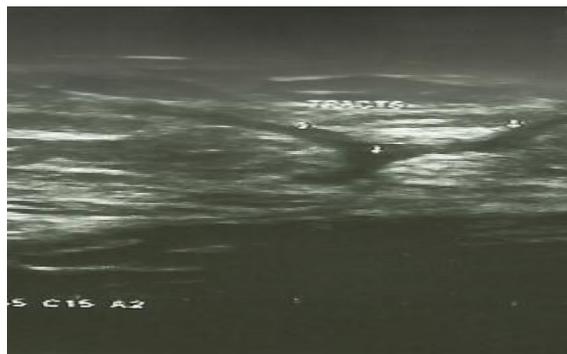


Figure 6b: Complex underlying port site sinus track.

DISCUSSION

Advances in the laparoscopic surgery have been immense in the last couple of decades. Starting from the laparoscopic cholecystectomy or diagnostic laparoscopy, the innovation has crossed the horizons of major oncological, bariatric and some benign surgical procedures. Even the closed spaces of head and neck, breast and retroperitoneum have been well explored. Laparoscopic surgery comes with its own subset of complications vis a vis the creation of pneumoperitoneum and of the effects there of. However the complication of port site tuberculosis is neither directly related to the laparoscopy nor to the surgical technique and hence emerges as an enigmatic embarrassment for the patient as well as the surgeon.

Outbreaks of port site tuberculosis along with isolated incidents have been reported in the literature in the last decade or so.^[6, 7] Reports of NTM causing infection after trauma or surgery, liposuction, silicon injection, pedicles and subcutaneous injections, implants are well known.^[8] These infections are mostly caused by a specific variant of atypical mycobacteria designated as rapid growers and include mycobacterium chelonae, fortuitum and some other rare types.^[8, 9] In our study all patients presented typically after a minimum period of three weeks following elective laparoscopic cholecystectomy and had an uneventful period till then. Port sites of all these patients were approximated with silk sutures or metallic clips with timely removal. No subcuticular sutures were

applied and sheath was not closed. There was no history of spillage of bile and or stones during the process of retrieval of the gallbladder specimen from the epigastric port. Pertinent to mention here that patients in our study presented with either port site nodular swelling, discharge or abscess representing 55%, 20% and 25 % of patients. Ten out of the eleven patients revealed granulomatous pathology on FNAC. Seven out of the ten patients subjected to culture reported rapidly growing atypical mycobacteria which is similar to study conducted by Rafael Silva Duarte et al.^[10] All patients presenting with discharge or abscess revealed simple to complex subcutaneous sinus tracks extending maximum up to the peritoneum [Figure 6a, 6b] as found in the case series reported by Nader Abd-Elhamid et al.^[11] However patients presenting with simple nodular swelling revealed simple underlying sinus tracks. This high incidence of underlying sinus tracks in the subcutaneous tissue is notably seen with the atypical mycobacterial soft tissue infection and plausibly explains the protracted course of the disease. In one of our patients the disease had persisted for more than 15 years before being cured. Patient had undergone multiple incision and drainage procedures in the past but in vain [Figure 3a, 3b]. Seven out of the nine patients subjected to culture revealed the growth of atypical mycobacteria (rapid growers). All patients were subjected to second line anti tubercular chemotherapy of ciprofloxacin and clarithromycin both 500 mg twice daily. One of our patients had received conventional antitubercular chemotherapy for approximately seven months without any significant relief; however patient started responding to the combination of ciprofloxacin and clarithromycin and was completely cured in eight months. All the patients responded to the chemotherapy well within a period six to nine months. This is in contradiction to some studies where complete cure has been reported in one to three months only.^[4] However the studies conducted by Mary A et al and Amit K S et al are in agreement with our study.^[8, 6] We used intralesional amikacin in only two cases wherein the initial response to the chemotherapy was not significant. Although the swellings appeared to have regressed post amikacin therapy, however the total time taken for complete resolution was more or less the same. The role of intralesional amikacin as advocated by many studies needs to be investigated further.^[4] The response to therapy was monitored clinically which revealed progressive decrease in the size of swelling and or spontaneous rupture followed by complete resolution subsequently [Figure 1a, 1b]. The patients presenting with discharge or abscess behaved similarly [Figure 4a, 4b, 4c]. Serial Sonographies conducted revealed complete resolution of the sinus tracks. We subjected one of our patients with persistent small sinus track to surgery (wide excision), although to limited advantage. However

the role of primary surgery in the management of port site tuberculosis needs to be assessed as there are isolated reports of cure following complete surgical excision of the lesions.^[7, 11] Major concern in our study was inability to obtain typical clinical isolates of the mycobacteria and drug sensitivity of the cultured mycobacteria and hence we aimed at assessing the role of most effective drug regimen against subcutaneous atypical mycobacterial infections and hence used the combination of ciprofloxacin and clarithromycin as implicated in the literature.^[2, 9] While evaluating the reasons for such port site lesions we could ascertain that in most of the cases the sterilization of the laparoscopic instruments was not proper. Most of the studies available conclude the same. The laparoscopic instruments are insulated and have multiple joints and crevices which can harbour mycobacterial spores which later germinate in the subcutaneous tissue and cause port site tuberculosis.^[12] Hence it is of paramount importance to clean the instruments of the charred tissue and or clotted blood as these act as nidus for the bacteria. A proper cleaning of the instrument is best achieved by ultrasonic technology.^[4, 12] Moreover the normal practice of using tap water for washing has to be discarded as it is the principal source of atypical mycobacteria. Most of the studies recommend washing with autoclaved water and or sterile normal saline and immediate drying of the instruments.^[13] The most commonly used agent for sterilization of laparoscopic instruments is 2% glutaraldehyde. Instruments (both ports with trocars and hand instruments) need to be immersed in the said solution for at least 10 hours for proper sterilization and a minimum of twenty minutes for disinfection. The solution has to be changed every two weeks or earlier depending upon the surgical burden of cases. A minimum of hundred cycles is recommended.^[4] Ethylene oxide gas sterilization is a better option instead, however it is not available at all centers. Although a higher concentration of glutaraldehyde has been advocated but some studies have reported resistance to even higher concentration.^[12] Orthophthaldehyde and per acetic acid may be used as a viable option as reported by Prakash K Sasmal et al.^[12] We recommend routine autoclaving of the ports along with trocars and or using a higher strength of glutaraldehyde for insulated hand instruments. Time taken for sterilization and disinfection is very important and should be strictly adhered to where ever the menace is prevalent.

CONCLUSION

Port site tuberculosis after laparoscopic surgery is a predicament for both the patient and the surgeon. All advantages of the minimal access surgery are drained with the port site discharge. Strict adherence to the well-established sterilization protocol is a

must to avoid the menace. High index of suspicion, early diagnosis and proper treatment is a must for early redressal of the disease. Counselling and prognostication of the patient is a must as the disease runs a protracted course and is associated with the word tuberculosis. Obtaining culture and sensitivity prior to starting the treatment is advocated.

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