J MEDICINE 2026; 27: 35-40

Original Article

Clinicopathological Features and Treatment Outcomes of Surgical Site Tuberculosis: A Prospective Observational Study.

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Abstract

Introduction: *Post-operative surgical-site infection by tuberculosis is rare condition. The objective of the study was to observe clinicopathological features and treatment outcomes of such patients.*

Methods: *This prospective study conducted on 23 patients with histologically diagnosed surgical site TB. Patients with a history of surgery then non-healing, discharging surgical site for more then one month were included. After tissue diagnosis of TB, anti TB CAT 1 was given to all patients and observed. Informed written consent from all patients and ethical clearance was taken.*

Results: *Among 23 patients, most were female (87%) and in the 25 to 36 year age group. Most 19(82.4%) patients were from Gynae and Obs and rest 4(17.6%) were from Surgery. 19(82.4%) patients undergone LSCS with Pfennenstiel incision and others from Surgery. 8(34.8%) presented with wound gap 17(73.9%) cases with wound pain and all had wound discharge pus(73.9%) or serous(26.1%). Three cases had DM(13.04%). Family history of PTB had 2(8.68%) cases. Among all, 15(65.2%) had MT Positivity(>10 mm), two cases were positive for both pus for AFB and gene Xpert, 16(69.56%) cases had Hb <10gm/dl. All had granulomatous inflammation on histopathology of wound margin tissue. 18(78.26%) patients declared cured, two patients needed extension, one patient had recurrence and two lost follow up.*

Conclusion: *Surgical site TB is a burden for the patients after recovery from the primary issue. Greater attention to peri-operative and post-operative care is needed to prevent surgical-site TB in our context.*

Key words: *Tuberculosis, Surgical site, Outcome, Wound TB, Granulomatous inflammation.*

DOI: *https://doi.org/10.3329/jom.v27i1.88276*

Received: *23 November, 2025* ***Accepted:*** *23 December, 2025*

Introduction:

Tuberculosis (TB) is an ancient disease documented in early human civilization also.[1] Pulmonary tuberculosis (PTB) is the main form of the TB infection. But this bacteria can cause infection in almost all organs of the body. Various Mycobacteria produce cutaneous infection, but surgical wound site TB is a rare entity.[1,2]

Surgical site infection is a common problem by many microorganisms.[3] Breached skin after surgery is the entry of the bacteria. After entry these bacteria causes poor healingof the wound responsible for production of signs and symptoms. History of fighting against infection is from the beginning of the civilization. At present in time management of wound infection is a challenging issue for the physicians of present time also.[4]

Different organisms can cause surgical site infection. It may be due to different factors including patients comorbidities, primary disease, operation theaters' conditions, sterilization facilities and postoperative antibiotic use and care. Post

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operative health condition and appropriate care is important to combat the wound site infection especially by the skin TB. Unfortunately this practice is poor among our patients also by some health care setting especially of the developing countries like us. Unscientific and irrational use of antibiotics and socio-cultural factors are related with surgical site TB.

Alarming situation is the long duration non healing surgical site wound and after long duration sufferings most of them are diagnosed as surgical site TB. They needed again long course treatment and strict follow-up is needed to get adherence to anti-TB drugs.[5,6] There are limited data on surgical site TB diagnosis and treatment outcome in Bangladesh and still paucity of study in our country. So it is a good opportunity do a study in this context.

Methods:

This prospective observational study included 23 patients with non-healing or discharging surgical-site wounds persisting for more than one month after surgery. Patients were recruited from the out patient department (OPD) of the Medicine, Surgery and Gynae after initial observation and referral to the principal investigator by the primary consultants. Study was conducted during one and half year period from 1st January 2024 to 30th June 2025. All patients had a history of surgery and all got necessary antibiotics for a duration of about 3-4 weeks at least. Their wound still not healed and discharging for at least one month or more. Pus from all patients was tested by gram staining and culture where no growth of pyogenic bacteria was found or empheric antibiotics could not cured the discharge for a minimum period of one month. These types of patients were primarily recruited for the study. Complete blood count(CBC), Chest X ray(CXR), Blood sugar, pus or wound swab for AFB and gene xpert and finally wound margin tissue were tested by histopathology to search granulomatous inflammation. If a granulomatous inflammation was found in the wound margin tissue was found then surgical site TB was diagnosed and selected finally for study subject and no granulomatous inflammation in the histopathology study were excluded. All histopathologically diagnosed patients were then referred to DOT'S Corner after labeling them as extra pulmonary TB/Wound TB for anti TB drug therapy. All got then a six months course of Anti-TB CAT-I according to National Guideline of tuberculosis treatment of Bangladesh. Drug dose were adjusted as per the body weight of the patients and followed up every one month interval for three months then on demand till the stopping of wound discharge. Those continuing discharge advise of Anti TB was lengthened for next three months. Complications were recorded if any. All patients were kept in contact by mobile phone communication. Patients were declared cure if they have no discharge from the wound margin for at least one month or more. All data were included in a case record form and after compilation and inclusion in Microsoft Excel 2020, it was tabulated in frequency and percentages and as it is an observational study to test of significance were applied and no formal statistical tests we4re performed, data are presented as frequencies, percentages, and mean ±SD. Ethical clearance was taken from the Institutional Review Board (IRB) of ChattogramMaa O Shishu Hospital Medical College(CMOSHMC/IRB/2024-13).

Results:

A total of 23 cases were included in this study. All tables are discussed in the legends of the respective tables below.

Table I. Patient personal data

	Variables	Number(Percent)
Gender	Female	20(86.9%)
	Male	3(13.1%)
Age group	<25 years	7(30.4%)
	26-30 years	7(30.4%)
	31-35 years	5(21.7%)
	>36 years	4(17.4%)

Table I shows more female then male(87.9% vs 13.1%) and age group distributions ranges from <25 years were 7(30.4%), 26- 30 years were 7(30.4%), 31 -35 years were 5(21.7%) and >36 years were 4(17.4%).

Table II. Patients surgery related data

Variables		Number/Percent
Departments	Gynae and Obs	19(82.4%)
	General surgery	4(17.6%)
Name of the operation	LSCS	19(82.4%)
	Laparotomy	1(4.3%)
	PCNL	1(4.3%)
	Lumpectomy breast	1(4.3%)
	Laparoscopy	1(4.3%)
Name of the incision	Pfennenstiel incision	19(82.4%)
	Midline incision	1(4.3%)
	Radial incision of breast	1(4.3%)
	PCNL port incision	1(4.3%)
	Laparoscopic port incision	1(4.3%)
Indications of operation		
Gynae and Obs cases	Fetal distress	6(26.1%)
	Meconium staining	2(8.7%)
	Previous CS	6(26.1%)
	Breech presentation	2(8.7%)
	Malposition of fetus	3(12.9%)
General Surgery & Urology	Gastric lesion	1(4.3%)
	Breast lump	1(4.3%)
	Renal stone	1(4.3%)
	Gall stone	1(4.3%)

Operation time in minutes Mean ±SD in Minutes G y n a e and ObsSurgery 45.26± 14.5742.00±20.01

Table 2 depicts different surgery related issues where 19(82.4%) patients from Gynae and Obs and 4(17.6%) patients from Surgery. All 19(82.4%) patients from gynae and obs were done LSCS with Pfennensteil incision for different indications like fetal distress 6(26.1), meconium staining 2(8.6%), previous CS6(26.1%), breech presentation 2(8.6%), malposition of fetus 3(12.9%). Again in the surgery midline incision for laparotomy, radial incision for breast lump, PCNL port incision for renal stone and laparoscopic port incision for gall stone were done in single case for all. Mean operation time was 45.3 minutes in Gynae and Obs and 42.00 mins in surgery cases.

Table III. Description of wound

Wound examination	Frequency/Percent
Wound Gap	8(34.8%)
Wound pain	17(73.9%)
Wound discharge	23(100%)
Pus	17(73.9%)
Serous	6(26.1%)

Table III showing description of wounds where 8(34.8%) presented with wound gap, wound pain was present in 17(73.9%) and all 23 cases had wound discharge and pus was on 17(73.9%) and serous secretion was in 6(26.1%) cases.

Table IV. Patients comorbidities and history

Variables	Frequency/ Percent
DM	3(13.04%)
HTN	1(4.34%)
BA	1(4.34%)
History of PTB	0
Family history of PTB	2(8.68%)
Fever	4(17.39%)
Cough	1(4.34%)
Weight loss	2(8.68%)

Table IV showing comorbidities where 3 cases were DM(13.04%) one case was HTN and one case was BA, F/H/PTB was 2(8.68%) and one case had cough and two cases had history of weight loss.

Table V. Investigation data

Investigations	Frequency/Percent
MT Positivity(>10 mm)	15(65.2%)
Normal CXR	23(100%)
Pus for AFB	2(8.68%)
Pus for Gene Xpert	28.68%)
High ESR (>30mm)	20(86.95%)
Low Hb(<10 gm/dl)	16(69.56%)
Normal N	23(100%)
Normal L	21(91.30%)
Granulomatous inflammation on HP of wound margin tissue	23(100%)

Table V showing investigation data where 15(65.2%) had MT Positivity (>10 mm), all had normal chest X-ray findings, two cases(8.68%) were positive for both pus for AFB and gene Xpert, low Hb(<10gm/dl) was present in 16(69.56%) cases, all had normal neutrophil count, 21(91.30%) cases had normal lymphocytes and all 23(100%) cases had granulomatous inflammation on histopathology of wound margin tissue.

Table VI. Outcome after Anti TB treatment

Treatment and outcome	Frequency/ Percent
Completed Anti TB 6 moths	18(78.26%)
Anti TB more then 6 month and completed and cured	2(8.69%)
Reappearance of sinus after declared cured twomonths later	1(4.34%)
Lost follow up	2(8.69%)
Complications after starting Anti TB	00

Table VI showing outcome after anti TB treatment where 18(78.26%) patients were declared cured and symptom free. Two patients(8.69%) needed extended anti-TB more than six months, one patient came again with history of discharge from a sinus after declared cured two months before, two patients(8.69%) were lost followup as they are unavailable by phone or non responder..

Discussion

In a developing country like Bangladesh Tuberculosis is a major health problem.[7] Mycobacteria can cause primary skin TB, but surgical site TB is rare. We have detected 23 cases of histopathologically confirmed surgical site TB in a

one and half year data collection period. A study done by Begam HS found only six cases over a period of nine years[6] but study was old (2011) and during that time diagnostic facility was not well developed.

Mycobacteria is a major health pathogen that cause an important health issue for the human hosts. Skin infection with Mycobacteria arises after intramuscular injections, surgery, skin abrasions, some penetrating trauma or on the port site for different surgical procedures, wound contaminated with disinfectants, soil or water.[8] Skin TB is being reported for last three decades in post surgical and post traumatic wounds. Its incidence is increasing in Bangladesh and other underdeveloped countries also. These may be caused by contaminated instruments or other unhealthy operation theatre practices.[8]

In the present study, all patients had discharging sinus for more than one months or more and nonresponsive to conventional antibiotics. It was found that postoperative wound infections caused by mycobacteriagenerally appear some weeks to some months following the procedure.[9] In acase series the incubation period ranged from 20 to 66 days with a median incubation period of 42 days.There were no clinical response to conventional antimicrobials and culture having no growth were the clues for TB infection.[9]

Female were affected more than the male found in our study. It was also found common in female as in a previous study.[9]

The post operative wound infection that was found were looked like the pyogenic infections with abscesses, skin indurations, discharging sinuses and erythema. Some patients had some systemic manifestations like fever with chills and weight loss as those were found in one previous study.[10] Regarding the clinical features in our study wound discharge with pus, wound gap and wound pain were common as also found in a previous study where they found erythematous nodules, indurations, microabscess and discharging sinuses.[11]

In our study, most of the patients undergone caesarean section with pfennenstiel incision and are suffering from TB and patients from general surgical procedure is less. Regarding how mycobacteria got entered in the body is thought that it may gained access to the surgical site wound from water supply during showering with early days of wound healing. Again mycobacterium was already on the skin and get entered due to poor skin preparation before surgery thus got access through the skin incision.[12] Again a study done by Maurer et al.,[13] showed some source of infections like contaminated gentian violet, rinsing solutions, antiseptic solutions, injections, poorly sterilized surgical instruments or unhealthy wound care.[13]

Regarding treatment, all patients were given anti TB treatment for six months(two months initiation phase and four months continuation phase) as per national guideline of Bangladesh where 18(78.26%) patients were declared cured and symptom free. Their wound discharge stopped and wound closed and wound pain subsided. One patient came again with history of discharge from a sinus after declared cured two months before which may be due to drug resistant mycobacteria. Two patients were lost follow up as they are unavailable by phone or non responder**.**

As there is a chance of recurrence anti TB drugs should be continued for at least six months or at least 3 to 6 wk after the wound heals.[14] In a recent work recommended that anti TB should be given for 6 to 12 months but in our country standard duration is yet to be established.[14] Two patients needed extended anti-TB more than six months due to nonhealing and discharging wound which may be due to rapidgrowing atypical mycobacteria which needs further evaluation and diagnostic procedures. There was similar experiences in a study done earlier.[11]

A case series study done by BegamHA in Dhaka among six patients who were successfully managed by four drugs standard anti-tubercular regime (Rifampicin, Isoniazid, Pyrazinamide, Ethambutol) for six months, as per WHO guideline.[6,7] They treated those patients in collaboration with the experts of Internal Medicine. In that series all patients responded well. Experiences were also similar with the present study.

There are some potential limitations of these study. Source of infection of mycobacteria could not be sorted out. Microbiological culture and genomic study was not done for all patients due to infrastructure facilities and financial issues.

Conclusion

Surgical site TB is not a uncommon issue for Bangladesh now. Proper sterilization is required alongside disinfection to prevent any post operation infections in patients undergoing different surgery in Gynae/Obs, general surgery or laparoscopic proceduresFuture multicenter study with mirobiological and molecular facilities should be done with a big sample to get the actual scenario of surgical site TB.

Funding: CMOSHMC small research fund

Conflicts of interest: None

Data availability: Available on justified request

Ethical approval: Taken

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