

# Delayed Surgical Site Infection by Tuberculosis – A Rising Cause of Concern ?

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### Summary:

**Background:** Surgical site infections causes significant morbidity and mortality of patients and causes more difficult to treat if unexpected cause behind the infection like tuberculosis. Delayed surgical site infection after initial healing are uncomfortable for both surgeons and patient.

**Methods:** Wound tissue from 18 patients with delayed surgical site infection not responding to antibiotics used for pyogenic infection were collected and examined histopathologically.

**Results:** Of the 18 patients, 9 revealed histologically tuberculosis, 7 non-specific chronic inflammation and

others showed foreign body granuloma. Association between histopathological report and incidence of tuberculosis is significant ( $p < 0.001$ ) and association between onset of infection and incidence of tuberculosis also significant ( $p < 0.05$ ).

**Conclusion:** A high degree of suspicion is required in case of delayed or recurrent surgical site infection to diagnose tuberculosis as a cause.

**Keyword:** Surgical site infection, tuberculosis, wound, granuloma.

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### Introduction:

Tuberculosis remains a major global health problem ranks as the second leading cause of death<sup>1</sup>. The latest estimates 8.7 million new cases in 2011 and 1.4 million died from tuberculosis<sup>1</sup>. Geographically, the burden of tuberculosis is highest (26%) in India<sup>1</sup>. The country, Bangladesh ranks 6<sup>th</sup> among 22 highest burden countries in the world<sup>2</sup>. Postoperative surgical site infection is common in almost all countries of the world and it varies from patient to patient, hospital to hospital and depending upon various factors<sup>3</sup>. But surgical site infection due to tuberculosis is a rare entity, in most cases, is caused by reactivation of dormant tuberculosis, spread of the infection by either haematogenous route

or direct inoculation from exterior or from a tuberculous abdominal lymph node or extension from underlying tubercular lesions<sup>4,5</sup>.

### Methodology:

This study included 18 patients (6 Male and 12 Female, aged 12 – 48 year) who had undergone surgery for various ailments between January 2009 to January 2013 at different hospitals in practicing area (Northern region of Bangladesh) of the authors. The patients developed delayed surgical site infections (2 weeks to 24 weeks after surgery) that were not responding to antibiotics and were sent for histopathological examinations of tissue from wound.

The patients had undergone Appendectomy(n=5), Caesarean section(n=5), laparoscopic cholecystectomy (n=3), Open cholecystectomy(n=2), Excision of keloid(n=1), Haemorrhoidectomy(n=1), Umbilical sinus excision(n=1).

Tissues from wounds were collected with sterile biopsy forceps/haemostatic forceps and after chemical fixation with 10% neutral buffered formalin the specimen was sent for histopathological examination.

Pus/discharge from wounds was collected with the help of sterile cotton swabs and/or syringes and was sent immediately for culture and sensitivity test.

Culture for mycobacterium could not be done due to limitation of resources at our clinical setting.

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**Results:**

A total of 18 patients with delayed surgical site infections were included in this study. All patients had more or less similar presentations :

- > appearance of erythema followed by breakdown of scar and suppuration,
- > discharging sinuses,
- > recurrent tiny stitch abscess formation,

in absence of systemic manifestations and no sign of improvement with traditional antibiotics and regular dressing.

All patients had no clinical symptoms of tuberculosis, no past history of tuberculosis and none had been contact with any patients of tuberculosis. So the diagnosis and initiation of treatment was delayed until confirmation by histopathology.

Among the 18 patients, 9 patients' wound tissues histopathologically showed granulomatous inflammation and epithelioid cells that consistent with

tuberculosis. The remaining showed non-specific, chronic inflammation and foreign body granuloma.

Five of the 18 patients' wound swab revealed growth of staphylococci, 3 revealed gram negative E. coli and others showed no growth in aerobic and anaerobic traditional culture.

In routine blood tests, all patients revealed haematologically normal except 5 patients showed raised ESR, ranging from 20 – 44 mm in the 1<sup>st</sup> hour. Chest X-Rays were negative for all cases. Tuberculin test was not done in all cases. Culture for mycobacterium could not be done due to limitation of resources.

In this study statistical analysis was done with SPSS 16. Chi-Square showed significant association between histopathological report and incidence of tuberculosis ( $\chi^2=27.00$ ,  $df=2$ ,  $p<0.001$ ) and strong correlation between histopathological report and incidence of tuberculosis (0.862,  $p<0.001$ ). There is also significant association between onset of infection and incidence of tuberculosis ( $\chi^2=15$ ,  $df=8$ ,  $p<0.05$ ).

**Table-I**

*Summary of patients with tuberculous post-operative wound infection (Total 9 patients) :*

Age in years	Sex	Preoperative diagnosis	Time interval	Presentation
20	Female	Appendicectomy	3 weeks	Scar abscess
22	Female	Caesarean section	2 weeks	Non-healing wound
35	Male	Excision of Keloid	24 weeks	Non-healing ulcer
48	Female	Laparoscopic Cholecystectomy	6 weeks	Port site abscess
25	Female	Caesarean section	12 weeks	Recurrent discharging sinus
35	Male	Laparoscopic Cholecystectomy	4 weeks	Port site abscess
35	Female	Appendicectomy	2 weeks	Recurrent discharging sinus
28	Female	Haemorrhoidectomy	12 weeks	Recurrent intra-anal sinus
12	Female	Excision of umbilical sinus	2 Weeks	Recurrent discharging sinus

Some pictures of Tubercular Wound

**Fig.-1:** Post Caesarean Section Wound**Fig.-2:** Post laparoscopic cholecystectomy port site wound



**Fig.-3:** *Umbilical Sinus wound*

#### **Discussion:**

In this study 9 patients were diagnosed tuberculous wound infection. Histopathologically all showed granulomata with epithelioid cells and among them only 4 showed variable areas of caseation necrosis, but others (5) showed significant supportive evidences like raised ESR and strongly positive Tuberculin Test. Patient had laparoscopic cholecystectomy and appendicectomy showed chronic cholecystitis and acute appendicitis in their operated specimen, histopathologically. Two patients had foreign body granuloma which were healed after removing of foreign body (suture materials) and then regular dressing. Others (7) showed non-specific inflammation which were completely healed by long term use of antibiotics, surgical debridement and regular dressing.

Histologic study was also the diagnostic tool in other studies<sup>5</sup>. Tuberculin test was not done in all cases. Culture for mycobacterium could not be done due to limitation of resources.

All tuberculous wound were responded well with standard anti-tubercular drugs and had no residual complication. The treatment was administered in collaboration with TB Clinics. All patients were under regular follow-up and complications free for 6 months.

Mycobacteria are important pathogens for post-surgical wound infections in many countries including India<sup>7</sup>.

All post-operative wounds had initially healed after surgery except two (one caesarean wound and one

appendicectomy wound), but latter became erythematous and gradually broke down to make discharging wound over a variable period of time. The wounds were painless and all patients with no systemic feature of tuberculosis. This non-healing wounds of confusing picture should always be ruled out by proper investigations, specially histopathology<sup>7</sup>. Begum HA reported 6 patients of post operative tuberculous wound infection, presenting mostly chronic discharging sinus (4 patients) and rest presented as non-healing wound<sup>6</sup>. Port site tuberculosis after laparoscopy are usually presented with port site abscess or persistent port site discharging sinus<sup>8,9</sup>.

After the initial infection of primary tuberculosis in the primary sites, there is dissemination of tubercular bacilli to remote parts of the body<sup>10</sup>. The host's immune system becomes sensitized. In 90% of immunocompetent people, there are no clinical manifestations, but the infection remains for years, probably for life<sup>11</sup>. The individual who has such an infection may later develop clinical disease depending on the immune status.

Secondary tuberculosis is the pattern of disease that arises in such a previously sensitized host. It may follow shortly, but more commonly occurs decades after initial infection particularly when host resistance is weakened<sup>12</sup>. Due to this waning of protection, secondary tuberculosis may result from (a) exogenous reinfection, as occurs in geographical regions of high endemicity, or more commonly from (b) reactivation of a latent primary focus with haematogenous spread to the site of the secondary infection or (c) local reactivation at the secondary site<sup>10</sup>.

Decreased immunity due to trauma may allow reactivation of latent bacteria at a distant focus, (which may be occult and undetectable on a chest X-ray) and result in subsequent seeding of the infection site<sup>10</sup>. Local reactivation can be precipitated by trauma or surgery, or any factor or insult that alters local tissue response. These again include injury, surgery, local vascular derangements, foreign body reactions or even chronic inflammation<sup>10</sup>.

#### **Conclusion:**

Surgical site infection by tuberculosis may be more common than diagnosed. Tuberculosis must be considered in wounds that show delayed, non-healing or recurrent surgical site infection with non responding to antibiotics.

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