

ORIGINAL RESEARCH

Post operative delayed wound healing associated with discharge -A case series treated for EPTB

¹Dr. Parthasarathi Giri, ²Dr. Amita Majumdar Giri, ³Tapan Ghosh, ⁴Dr. Debjit Paul, ⁵Dr. Gautam Narayan Sarkar, ⁶Sujoy Roy

¹Professor, Department of Emergency Medicine, Santiniketan Medical College, Muluk, West, Bengal, India

²Professor, Department of Pathology, Santiniketan Medical College, Muluk, West Bengal, India

³Director, Blood Bank, Santiniketan Medical College, Muluk, West Bengal, India

⁴Assistant Professor, Department of Surgery, IIMSAR, Haldia, West Bengal, India

⁵Professor & Principal, Santiniketan Medical College, Muluk, West Bengal, India

⁶Research coordinator, CINI, West Bengal, India

Corresponding Author

Dr. Parthasarathi Giri

Professor, Department of Emergency Medicine, Santiniketan Medical College, Muluk, West, Bengal, India

Email: parthas.g54@gmail.com

Received date: 20 April, 2024

Acceptance date: 23 May, 2024

ABSTRACT

Aim:

- To investigate the association between delayed wound healing and discharge after surgical procedure in patients treated for extrapulmonary tuberculosis (EPTB).
- To start ATD therapy through the combined assessment by the Revised National Tuberculosis Programme (RNTCP) on the basis of clinical findings without much depending on the positive laboratory results.

Material and Methods: A total of 22 individuals had surgical interventions in the Emergency Medicine (EM), Surgery, Gynaecology & Obstetrics (G&O), Orthopedic, and Medicine departments. Diagnosed with extra pulmonary tuberculosis (EPTB). This study points us cases of delayed wound healing following surgery, which were accompanied by the presence of discharge. The clinical evaluation and investigation followed a systematic protocol, which included a complete blood count (CBC), measuring erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels, performing tuberculosis-specific assays such as the Mantoux test and GeneXpert MTB/RIF, and obtaining wound cultures to detect infectious agents. Imaging techniques such as X-rays, USG, MRI, or CT scans were used as needed depending on the clinical situation. These imaging investigations are used to create anatomical maps that help in surgery planning. The comprehensive medical history, Thorough physical examination, Evaluation of nutritional status, and Assessment of signs and symptoms of sepsis. **Results:** This included the distribution of different types of extra pulmonary tuberculosis (EPTB). The lymphatic type accounts for 6 cases, which is 27.27% of the total. The pleura type also has 6 cases, making up 27.27%. The skeletal and abdominal types each have 5 cases, representing 22.73% of the total. The distribution of operations based on their kind and timing. There were 10 emergency surgeries, accounting for 45.46% of the total, and 12 planned procedures, accounting for 54.54%. All patients were provided with sepsis control, nutritional support, anatomical mapping, and planning for future stages. The average recovery period is 45.65±5.34 days, with a range of 30 to 60 days. Every patient showed the progress and is now receiving ongoing ATD treatment in accordance with RNTCP recommendations. **Conclusion:** The implementation of ATD treatment had a crucial role in the establishment of many healthcare modifications aimed at improving the quality of life. The group of patients, consisting of 22 individuals with different characteristics, showed positive responses to ATD treatment within a timeframe of 3-6 months. Three patients required wound closure with cyanoacrylate glue application. A single patient had treatment with staples to close the gap. The discharge was halted upon the administration of ATD treatment.

Keywords: SNAP, EPTB, Delayed wound healing

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution- Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Delayed wound healing after surgery is a major problem in people who have underlying diseases like

extrapulmonary tuberculosis. EPTB accounts for around 15-20% of all tuberculosis cases. It affects other organs beyond the lungs, such as the lymphatic

system, pleura, skeletal system, skin and intestine. The surgical treatment in EPTB patient requires cautious handling owing to the impaired immune system of these patients, the intricate nature of the illness, and the elevated risk of infection.¹⁻³

Delayed wound healing and the accompanying discharge may be ascribed to several causes, such as the presence of Mycobacterium tuberculosis in the tissues, suboptimal nutritional state, and insufficient infection control measures. These problems not only extend the duration of hospital stays and raise healthcare expenses, but also provide a substantial danger for illness and death.^{4,5}

An all-encompassing strategy is necessary for the efficient care of post-operative wounds in patients with extrapulmonary tuberculosis EPTB. This requires careful and thorough assessment before, during, and after the surgery. The mnemonic SNAP—Sepsis control, Nutrition Backup, Anatomical mapping, and Plan for the next—offers a systematic framework for treating patients with these conditions. This strategy prioritizes the management of infection, the provision of sufficient nourishment, accurate anatomical evaluation, and meticulous planning for continuous care.⁶ This research aims to emphasize the crucial elements of treating post-operative complications in patients with extrapulmonary tuberculosis EPTB and to provide insights that might enhance patient treatment and outcomes. This case series intends to provide the results of 22 patients with EPTB who sustained delayed wound healing after surgery, accompanied by discharge. These patients were treated in different departments, such as Emergency Medicine, Surgery, Gynecology & Obstetrics, Orthopedics, and Medicine, at many hospitals. The research aims to use the SNAP recommendations and regular surgical procedures to effectively address the difficulties associated with delayed wound healing in this specific group of patients.

MATERIAL AND METHODS

This research was a retrospective case series analysis done in various hospital settings from 2014 to the present. The settings included of COMJNMH, Kalyani, IIMSAR, Haldia, Imambarah Sadar Hospital, and SMC, Santiniketan.

A total of 22 individuals had surgical interventions in the Emergency Medicine (EM), Surgery, Gynecology & Obstetrics (G&O), Orthopedics, and Medicine departments. Diagnosed with extrapulmonary tuberculosis (EPTB). This research examined cases of delayed wound healing following surgery, which were accompanied by the presence of discharge.

The clinical evaluation and investigation followed a systematic protocol, which included doing a complete blood count (CBC), measuring erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels, performing tuberculosis-specific assays

such as the Mantoux test and GeneXpert MTB/RIF, and obtaining wound cultures to detect infectious agents. Imaging techniques such as X-rays, ultrasound, MRI, or CT scans are used as needed depending on the clinical situation. These imaging investigations are used to create anatomical maps that help in surgery planning. Comprehensive medical history, Thorough physical examination, Evaluation of nutritional status, and Assessment of signs and symptoms of sepsis.

Pre-Operative, Peri-Operative, and Post-Operative Management

The management protocol was based on the mnemonic SNAP:

Sepsis Control: Administration of appropriate antibiotics based on culture and sensitivity and Regular monitoring of infection markers.

Nutrition Backup: Ensuring adequate nutritional support, including high-protein diets and supplementation if necessary.

Anatomical Mapping: Pre-operative imaging to accurately map the area of surgical intervention.

Plan for Next: Developing a comprehensive post-operative care plan including wound care, follow-up visits, and monitoring for complications.

Surgical Procedures:

Patients underwent various surgical interventions tailored to their specific type of EPTB:

- **Lymphatic EPTB:** Lymphadenectomy
- **Pleural EPTB:** Pleurectomy
- **Ascites:**
- **Skeletal EPTB:** Debridement
- **Abdominal EPTB:** Abscess drainage

The surgeries were conducted following established surgical protocols, using suitable anaesthetics and aseptic methods.

Data collection and analysis

Retrospective data were obtained from patient medical records, encompassing demographic information such as age and gender. The data also included information on the type of extrapulmonary tuberculosis (EPTB) and the timing and type of surgical intervention (whether it was emergency or planned). Additionally, details regarding the SNAP management protocol, healing time after surgery (measured in days), and outcomes (such as improvements in wound healing or complications) were recorded. Analysed data was used to assess the efficacy of the SNAP regimen in controlling delayed wound healing after surgery in individuals with extrapulmonary tuberculosis (EPTB).

RESULTS

Table 1 indicates that there were 12 males, accounting for 54.54% of the total, and 10 females, representing 45.46%. The age distribution is as follows: 0-10 years (4.54%), 11-20 years (4.54%), 21-30 years (4.54%),

31-40 years (22.73%), 41-50 years (13.64%), 51-60 (9.09%), 81-90 years (9.09%), and over 91 years (4.54%), 61-70 years (22.73%), 71-80 years (4.54%).

Table 1 Gender and age of the participants

	Number	Percentage
Gender		
Male	12	54.54
Female	10	45.46
Age		
0-10	1	4.54
11-20	1	4.54
21-30	1	4.54
31-40	5	22.73
41-50	3	13.64
51-60	1	4.54
61-70	5	22.73
71-80	2	9.09
81-90	2	9.09
Above 91	1	4.54

Table 2 displays the distribution of different types of extrapulmonary tuberculosis (EPTB). The lymphatic type accounts for 6 cases, which is 27.27% of the total. The pleural type also has 6 cases, making up 27.27%. The skeletal and abdominal types each have 5 cases, representing 22.73% of the total.

Table 2 Types of EPTB

Types of EPTB	Number	Percentage
Lymphatic	6	27.27
Pleural	6	27.27
Skeletal	5	22.73
Abdominal	5	22.73

Table 3 displays the distribution of operations based on their kind and timing. There were 10 emergency surgeries, accounting for 45.46% of the total, and 12 planned procedures, accounting for 54.54%.

Table 3 Surgery Type and Timing

Surgery Type and Timing	Number	Percentage
Emergency surgeries	10	45.46
Planned surgeries	12	54.54

Table 4 SNAP

	Number	Percentage
Sepsis Control	22	100
Nutrition Backup	22	100
Anatomical Mapping	22	100
Next Plan	22	100
Healing Time (days)	45.65±5.34 days	
Outcome		
Improved	22	100



Figure 1: Peritoneal cocoon



Figure 2: Healing wound after ATD therapy



Figure 3: A discharging granuloma

All patients were provided with sepsis control, nutritional support, anatomical mapping, and planning

for future stages. The average recovery period is 45.65 ± 5.34 days, with a range of 30 to 60 days. Every

patient shown progress and is now receiving ongoing treatment in accordance with RNTCP recommendations.

We selected a group of clinical criteria along with the investigations to send those patients to RNTCP for ATD therapy. They include the sign and symptoms as below:

1. A portion of non healing wound more than 30 days
2. Associated serous or purulent discharge from the wound
3. Unusual weakness
4. Fever as a recurrent events
5. Irregular bowel habit over 2-3weeks
6. Abdominal and /or bone pain
7. Flatulence & dyspnoea of long duration even with Irregular intake of ppis
8. Acidity & heart burn
9. Long standing skin ulcer not responding to the planned management by antibiotics
10. Infertility 2+yrs
11. Sub cutaneous nodules including matted nodes(Erythema nodosum)
12. Weight loss even with usual diets
13. Long standing sore throat and tongueulcer
14. Ascites

This case series demonstrates the successful treatment of delayed wound healing after surgery employing a thorough approach before, during, and after the operation, which is described by the acronym SNAP. The consistent implementation of sepsis management, nutritional support, anatomical mapping, and planning for future steps had a role in the favorable results shown in all 22patients.Regardless of the variations in patient circumstances and forms of extrapulmonary tuberculosis (EPTB), the continuous use of SNAP principles guaranteed that all patients achieved enhancement in wound healing and general health.

DISCUSSION

This case series focuses on the difficulties and approaches to managing delayed wound healing after surgery in patients being treated for EPTB) who experience discharge. The research examined 22 patients who had different surgical procedures and were treated utilizing the SNAP protocol, which stands for Sepsis control, Nutrition Backup, Anatomical mapping, and Plan for the next. This comprehensive strategy was designed to reduce problems and enhance the process of wound healing. Post-operatively, all patients had delayed wound healing and discharge, with healing durations varying from 30 to 60 days.

The use of the SNAP protocol seems to have a beneficial impact on the management of these problems, resulting in improved outcomes for all patients.

The age of patients spanned from under 10 to over 91 years, with a nearly equal mix of men and females, indicating the typical diversity of demographics seen in instances of extrapulmonary tuberculosis (EPTB).

Research has repeatedly shown that patients with extrapulmonary tuberculosis (EPTB) are more prone to experiencing post-operative problems, such as delayed wound healing. A research conducted by Santos et al. (2015) shown that TB may have a substantial negative impact on the healing of wounds.⁴ This is mostly due to the persistent inflammatory response and the persistence of mycobacterial infection in the tissues. Our results are consistent with this, since all patients showed delayed recovery, highlighting the ongoing difficulty presented by EPTB.

Ensuring proper infection control is of utmost importance while addressing post-operative wounds in patients with extrapulmonary tuberculosis (EPTB). The focus of our investigation on sepsis control is corroborated by comparable discoveries in the literature. Jacobson (2011) highlighted the need of implementing stringent infection control protocols in TB patients who are having surgery.⁶ It was stressed that insufficient control measures may result in serious consequences and protracted recovery durations. The use of certain antibiotics depending on culture sensitivity in our research highlights this crucial component of healthcare.

Malnutrition is a prevalent issue among individuals with TB and may have a negative impact on the process of wound healing. The significance of nutrition in the process of wound healing has been widely recorded. Van Lettow et al. (2003) conducted a research that emphasized the significance of dietary treatments in enhancing the clinical results of patients with tuberculosis.⁷ The strategy of our investigation, which ensures sufficient nutritional support, is consistent with these results and indicates that nutritional assistance is crucial for promoting good wound healing in patients with extrapulmonary tuberculosis (EPTB).

Utilizing pre-operative imaging for anatomical mapping, as conducted in our research, is crucial for accurate surgical intervention. The validity of this technique is supported by studies such as the one conducted by Velayati and Farnia (2013), which highlighted the significance of thorough anatomical evaluation in the surgical treatment of tuberculosis patients in order to reduce problems and achieve improved results.⁸

The research utilizes the SNAP protocol, which is a complete management technique, and is supported by existing literature. A systematic review conducted by Norbis et al. (2014) emphasized the need of implementing integrated care strategies for the management of TB.⁹ These strategies include meticulous surgical planning, effective infection control measures, provision of nutritional support, and comprehensive follow-up plans.

CONCLUSION

Reaching a definitive conclusion using a binary yes/no approach is quite challenging. The difficulty in demonstrating mycobacteria is the reason for this. Additionally, it is very difficult to illustrate using cellular cytology or histology. Therefore, accurate diagnosis requires both clinical evaluations and radiological results. We engaged in collaboration with the departments, according to the principles of vertical integration. The implementation of ATD treatment had a crucial role in the establishment of many healthcare modifications aimed at improving the quality of life. The group of patients, consisting of 22 individuals with different characteristics, showed positive responses to ATD treatment within a timeframe of 3-6 months. Three patients required wound closure with cyanoacrylate glue application. A single patient had treatment with staples to close the gap. The discharge was halted upon the administration of ATD treatment. The Corona virus may exacerbate the development of EPTB.

REFERENCES

1. World Health Organization. (2020). Global Tuberculosis Report.
2. Sharma, S. K., & Mohan, A. (2004). Extrapulmonary tuberculosis. *Indian Journal of Medical Research*, 120(4), 316-353.
3. Norbis, L., Alagna, R., Tortoli, E., Codecasa, L. R., & Migliori, G. B. (2014). Tuberculosis: Lights and shadows in the current diagnostic landscape. *New Microbiologica*, 37(2), 129-146.
4. Santos, G. M., Almeida, A. M., Oliveira, J. R., & Mesquita, C. L. (2015). Tuberculosis and delayed wound healing: a case report. *Journal of Clinical and Diagnostic Research*, 9(6), ZD04-ZD06.
5. Velayati, A. A., & Farnia, P. (2013). Tuberculosis complications and their management. *The International Journal of Mycobacteriology*, 2(3), 158-163.
6. Jacobson, K. (2011). Post-operative care and wound management in tuberculosis. *Clinical Infectious Diseases*, 52(5), 468-475.
7. van Lettow, M., Fawzi, W. W., & Semba, R. D. (2003). Triple trouble: the role of malnutrition in tuberculosis and human immunodeficiency virus co-infection. *Nutrition Reviews*, 61(3), 81-90.
8. Velayati, A. A., & Farnia, P. (2013). Tuberculosis complications and their management. *The International Journal of Mycobacteriology*, 2(3), 158-163.
9. Norbis, L., Alagna, R., Tortoli, E., Codecasa, L. R., & Migliori, G. B. (2014). Tuberculosis: Lights and shadows in the current diagnostic landscape. *New Microbiologica*, 37(2), 129-146.