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Comparison of Outcome Between Anti-Tubercular Therapy Alone and Selective Neck Dissection Followed by Anti-Tubercular Therapy in Retreatment Cases of Tubercular Cervical Lymphadenopathy

Dr. Shahin Sultana Shimu[1], Dr. Abdullah Al Marjuq[2], Dr. Rajat Kanti Sarker[3], Dr. S M Shohan Reza[4]

1. Registrar, Department of Otolaryngology and head-neck surgery, Chattogram Maa-O-Shishu Hospital, Chattogram, Bangladesh.
2. Medical Officer. OSD, Directorate General of Health Services (DGHS), Dhaka, Bangladesh.
3. Registrar, Department of Otolaryngology and head-neck surgery, National Institute of ENT, Dhaka, Bangladesh
4. Registrar, Department of Otolaryngology and head-neck surgery, Universal Medical College & Hospital

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ABSTRACT

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Background: Tubercular cervical lymphadenopathy (TCL) is a common form of extrapulmonary tuberculosis (EPTB), frequently presenting with painless cervical lymph node swelling. Treatment primarily involves anti-tubercular therapy (ATT), but in cases of relapse or treatment failure, the addition of surgical intervention may enhance outcomes. This study aims to compare the outcomes of ATT alone versus a combination of selective neck dissection (SND) followed by ATT in retreatment cases of tubercular cervical lymphadenopathy.

Methods: A single-blind, randomized controlled trial was conducted at Dhaka Medical College Hospital from January 2022 to July 2023. A total of 48 patients with retreatment cases of TCL were randomly assigned to either Group A (SND + ATT) or Group B (ATT alone). Data were collected on demographic characteristics, clinical presentation, lymph node involvement, diagnostic methods, and treatment outcomes. Patients were followed up every two months for six months to assess treatment efficacy.

Results: The study found no significant differences in demographic characteristics between the groups. In terms of treatment outcomes, Group A showed a significantly higher cure rate (95.83%) compared to Group B (75.0%) ($p = 0.043$). Recurrence of disease was significantly lower in Group A (4.16%) than in Group B (25.0%) ($p = 0.042$). Complication rates were similar between the groups (Group A: 4.16%, Group B: 12.5%), with no significant difference ($p = 0.300$).

Conclusion: The addition of Selective Neck Dissection to Anti-Tubercular Therapy in retreatment cases of tubercular cervical lymphadenopathy significantly improves cure rates and reduces recurrence without increasing complications. These findings suggest that surgical intervention may be beneficial for patients with TCL who fail or relapse with medical therapy alone.

Corresponding author
Dr. S. S. Shimu*

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INTRODUCTION

Tuberculosis (TB) continues to be a major global health issue, ranking among the top causes of mortality, particularly in Bangladesh, which has the highest TB burden worldwide [1]. While pulmonary TB is more easily diagnosed and treated due to the availability of diagnostic samples, extrapulmonary TB (EPTB) presents significant challenges in both diagnosis and treatment. EPTB is often characterized by heterogeneous clinical manifestations, difficulty in obtaining diagnostic samples, poor drug penetration into affected tissues, and unclear treatment durations, which complicate management [2]. Tuberculous lymphadenitis, the most common form of EPTB, is frequently observed in the cervical lymph nodes, commonly known as "scrofula" [3]. It accounts for 15-20% of all TB cases, with cervical involvement being the most prevalent [4,5]. The clinical presentation typically involves painless swelling of the cervical lymph nodes, which can progress to abscess formation and sinus tract development if left untreated [6,7]. Early diagnosis and appropriate treatment are crucial; however, the treatment response is slower than that observed in pulmonary TB, and paradoxical reactions can occur in a subset of patients [4,8].

The global TB burden remains substantial, with an estimated 9.9 million new cases and 1.3 million TB-related deaths in 2020. Bangladesh is one of the countries with the highest TB incidence, reporting approximately 360,000 new cases and 44,000 deaths annually [9]. Moreover, multidrug-resistant tuberculosis (MDR-TB) poses a significant challenge, with prevalence rates of 0.7% in new cases and 11% in retreatment cases. Despite an increase in treatment coverage from 27% in 2002 to 81% in 2019, a large number of TB patients remain undetected each year, hindering progress in TB control efforts [9].

Diagnosing tuberculous lymphadenitis typically involves fine needle aspiration (FNA), culture, and polymerase chain reaction (PCR) testing. FNA is widely recommended as the initial diagnostic test due to its high sensitivity and specificity, while the Gene Xpert MTB/RIF test has further enhanced diagnostic accuracy [10]. The standard treatment for drug-susceptible TB involves a six-month regimen of four first-line anti-tubercular drugs, followed by maintenance with rifampicin and isoniazid [11]. However, treatment duration may vary, particularly for EPTB, where longer treatment may be necessary in cases of relapse or treatment failure.

Surgical interventions such as selective neck dissection (SND) have been shown to improve outcomes in patients with tubercular cervical lymphadenopathy, especially in cases where medical treatment alone is insufficient [12]. Surgery helps reduce complications such as abscess formation, sinus tracts, and fistulae, thereby enhancing both cure rates and cosmetic outcomes [13]. While anti-tubercular therapy remains the cornerstone of treatment, surgery may enhance outcomes in cases of persistent or recurrent disease following medical therapy [14].

The aim of this study was to compare the effectiveness of combined selective neck dissection and anti-tubercular therapy with anti-tubercular therapy alone in retreatment cases of cervical tubercular lymphadenopathy, specifically assessing the impact on cure rates, recurrence, and complications.

METHODOLOGY

Study Design

This single-blind, randomized controlled trial was conducted over an 18-month period, from January 2022 to July 2023.

Place of Study

The study was conducted at the Department of Otolaryngology and Head and Neck Surgery, Dhaka Medical College Hospital, Dhaka.

Study Population and Sampling Technique

The study population consisted of patients with retreatment cases of tubercular cervical lymphadenopathy, selected based on predefined inclusion and exclusion criteria. Initially, purposive sampling was used to select participants, followed by random allocation using a simple random sampling technique. Inclusion criteria included patients with relapse or treatment failure of tubercular cervical lymphadenopathy. Exclusion criteria included patients with smear-positive pulmonary tuberculosis, multidrug-resistant tuberculosis (MDR-TB), systemic co-morbidities, HIV-positive patients with TCL, incomplete treatment with anti-tubercular drugs, patients unfit for surgery or unwilling to undergo surgery, tuberculosis affecting sites other than cervical lymph nodes, and those participating in another clinical trial.

Study Procedure

The sample size for this study was 48 patients, randomly allocated into two groups of 24 patients each. This randomized control trial was conducted at Dhaka Medical College Hospital from January 2022 to July 2023. All patients presenting with suspected tubercular cervical lymphadenopathy were initially screened. New cases were excluded, and retreatment cases were confirmed through tuberculosis testing and anti-tubercular resistance testing (DST). Patients meeting the inclusion criteria were enrolled after obtaining informed consent. A thorough history, clinical examination, and necessary investigations were performed, including pre-operative evaluations such as hemoglobin level, full blood count, random blood sugar (RBS), chest X-ray, ECG, and other relevant tests.

Patients were divided into two groups:

• Group A: Received selective neck dissection followed by ATT

• Group B: Received ATT alone

All patients were followed up every two months for six months to assess the response to treatment. Patients with persistent symptoms or new complications were re-investigated for MDR-TB and managed accordingly.

Outcome Measures

The outcome was defined as “cure” if there was complete resolution of clinical features and lymphadenopathy. For Group A, cure was considered after SND and completion of ATT, with no remaining cervical lymph nodes >10 mm. For Group B, cure was considered with the disappearance of cervical lymph nodes (diameter <10 mm) after six months of ATT.

Statistical Analysis

Data were analyzed using SPSS version 22 (SPSS Inc., Chicago, IL, USA). Descriptive statistics (mean ± SD for continuous variables, frequency, and percentage for categorical variables) were used to summarize the data. The unpaired t-test was used to compare continuous variables, while the Chi-square test was applied to categorical variables. Statistical significance was set at $p < 0.05$. No significant differences were found between the groups in terms of age, gender, and residence ($p > 0.05$). Treatment outcomes showed a significantly higher cure rate in

Group A (95.83%) compared to Group B (75%) (p = 0.043). Recurrence of disease was also significantly lower in Group A (4.16%) versus Group B (25%) (p = 0.042). Complications were similar between the groups (p = 0.300). Results were presented in tables and figures for clarity.

Ethical Considerations

The study protocol was approved by the Ethical Review Committee of Dhaka Medical College. Informed written consent was obtained from patients or their legal guardians, ensuring they understood the study's purpose, procedures, risks, and benefits. Participants were informed of their right to withdraw at any time without affecting their treatment. All precautions were taken to minimize risks and ensure that patient rights were upheld throughout the study.

RESULTS

Table 1 shows the demographic distribution of patients with tubercular cervical lymphadenopathy in Group A and Group B. The majority of patients are in the 21-40 years age group (45.8%), with a similar mean age in both groups (Group A: 41.6 ± 7.2, Group B: 41.7 ± 7.4; p = 0.962). Gender distribution is balanced, with 34.0% males and 66.0% females in the total sample, and no significant difference between the groups (p = 1.00). Most patients reside in rural areas (68.7%), with no significant difference in residence between the groups (p = 0.604). **(Table 1).**

Table 1: Demographic Distribution of Patients with Tubercular Cervical Lymphadenopathy in Group A and Group B

Age (years)	Frequency & Percentage		Total (%)	p-value
	Group A (n = 24) No. (%)	Group B (n = 24) No. (%)		
0-20	2(8.3%)	1(4.1%)	3(6.25%)	0.962
21-40	10(41.7%)	12(50%)	22(45.8%)	
41-60	9(37.5%)	7(29.1%)	16(33.3%)	
>60	3(12.5%)	4(16.7)	7(14.5%)	
Mean ± S.D.	41.6±7.2	41.7±7.4		
Gender distribution				
Male	8 (33.3%)	8 (33.3%)	16 (34.0%)	1
Female	16 (66.7%)	16 (66.7%)	32 (66.0%)	
Residence				
Rural	17 (70.8%)	16 (66.7%)	33 (68.7%)	0.604
Urban	7 (29.2%)	8 (33.3%)	15 (31.3%)	

Table 2 shows the clinical profile and lesion location of patients with tubercular cervical lymphadenopathy. All patients had cervical neck swelling. Other symptoms like weakness, anorexia, and nausea were observed in 72.9% of patients, with no significant differences between the groups (p = 0.609, p = 0.823). Weight loss was seen in 87.5%, with a higher

prevalence in Group B (91.7%) compared to Group A (83.3%), though not significant (p = 0.754). Regarding lesion location, 68.8% had right-sided lesions, and 31.3% had left-sided lesions, with no significant difference between the groups (p = 0.350). **(Table 2)**

Table 2: Clinical Profile and Location of Lesion in Patients with Tubercular Cervical Lymphadenopathy

Variable	Group A (n=24)	Group B (n=24)	Total (n=48)	p-value
Clinical Profile				
Cervical neck swelling	24 (100%)	24 (100%)	48 (100%)	1.000
Weakness	19 (79.1%)	16 (66.7%)	35 (72.9%)	0.609
Anorexia, nausea	15 (62.5%)	12 (50%)	27 (56.3%)	0.823
Weight loss	20 (83.3%)	22 (91.7%)	42 (87.5%)	0.754
Location of Lesion				
Right-sided lesion	18 (75%)	15 (62.5%)	33 (68.8%)	0.350
Left-sided lesion	6 (25%)	9 (37.5%)	15 (31.3%)	

Table 3 summarizes the lymph node (LN) characteristics of patients with tubercular cervical lymphadenopathy. All patients had unilateral lymphadenopathy, with no cases of bilateral involvement. Most patients (68.75%) presented with multiple lymph nodes, while 31.2% had a solitary lymph node. Lymph node distribution was similar in both groups, with Level V most commonly affected (45.8%), followed by Levels II and IV (22.9% each). Regarding size, 54.1% of nodes measured 3-6 cm, 22.9% were larger than 6 cm, and 22.9% were smaller than 3 cm. There were no significant differences between the groups in LN characteristics. **(Table 3)**

Table 3: Lymph Node (LN) Findings in Patients with Tubercular Cervical Lymphadenopathy

LN findings	Frequency & Percentage		Total
	Group A (n = 24) No. (%)	Group B (n = 24) No. (%)	
Distribution			
Unilateral	24(100)	24(100)	48(100)
Bilateral	0	0	0
Mode of presentation			
Solitary LN	7(29.1)	8(33.3)	15(31.2)
Multiple LN	17(70.8)	16(66.6)	33(68.75)
Level			
Level II	6(25)	5(20.8)	11(22.9)
Level III	2(8.3)	2(8.3)	4(8.3)
Level IV	6(25.0)	5(20.8)	11(22.9)
Level V	10(41.6)	12(50)	22(45.8)
Size			
<3cm	5(20.8)	6(25)	11(22.9)
3-6 cm	13(54.1)	13(54.1)	26(54.1)
>6cm	6(25)	5(20.8)	11(22.9)

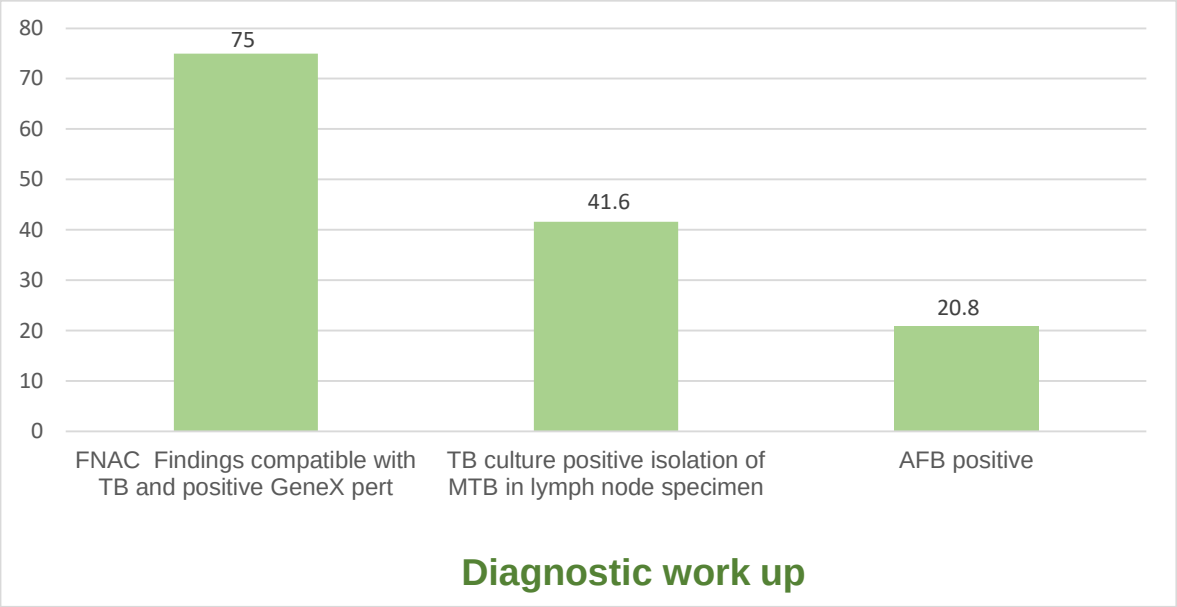

Figure 1: Diagnostic Work-up Results in Patients with Tubercular Cervical Lymphadenopathy

This figure 1 illustrates the diagnostic results for tubercular cervical lymphadenopathy in patients. The majority of patients (75%) had a positive Fine Needle Aspiration Cytology (FNAC) result combined with a positive Gene Xpert. Additionally, 41.6% of patients tested positive for Mycobacterium tuberculosis (MTB) through culture, while 20.8% had a positive smear for Acid-Fast Bacilli (AFB). **(Figure 1)**

Table 4 presents the treatment outcomes in patients with tubercular cervical lymphadenopathy. Group A had a significantly higher rate of complete resolution (95.83%) compared to Group B (75.0%) with a p-value of 0.043. The recurrence of disease was also lower in Group A (4.16%) versus Group B (25.0%) with a p-value of 0.042. However, complications were similar between the groups, with 4.16% in Group A and 12.5% in Group B (p = 0.300). **(Table 4)**

Table 4: Outcome of Treatment in Patients with Tubercular Cervical Lymphadenopathy

Outcome	Frequency & Percentage*		p-value
	Group A (n = 24) No. (%)	Group B (n = 24) No. (%)	
Complete resolution	23(95.83)	18(75.0)	0.043
Recurrence of disease	1(4.16)	6(25.0)	0.042
Complication	1(4.16)	3(12.5)	0.300

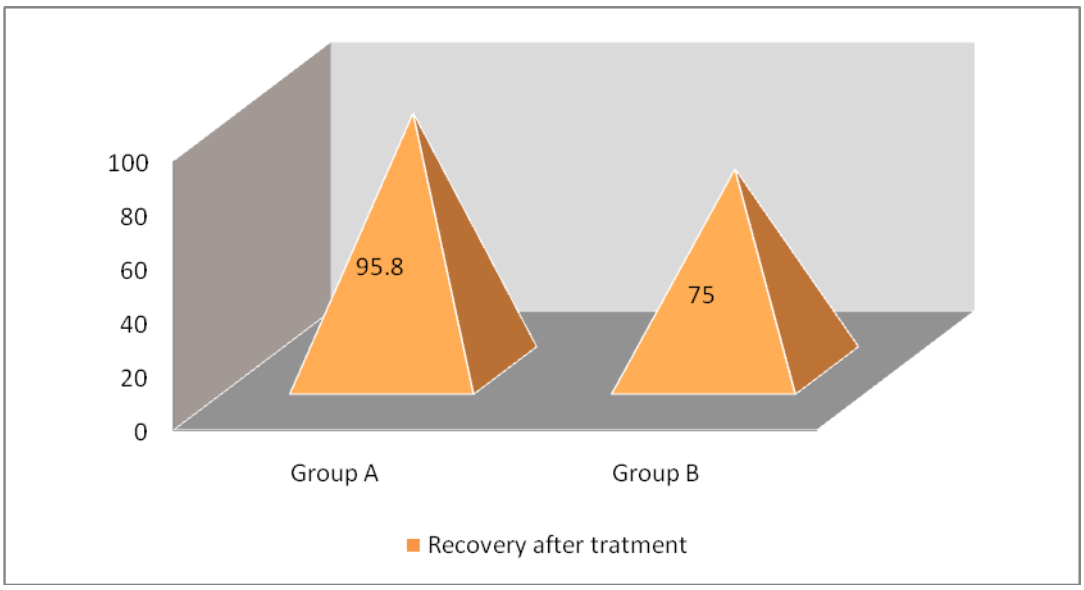

Figure 2: Cure rate after treatment of cervical tubercular lymphadenopathy (n=48)

Figure 2 shows the cure rates for cervical tubercular lymphadenopathy. In Group A, 95.83% (23/24) of patients achieved complete recovery with Selective Neck Dissection and Anti-Tubercular Drugs, while 75.0% (18/24) in Group B, treated with Anti-Tubercular Drugs alone, had the same outcome. **(Figure 2)**

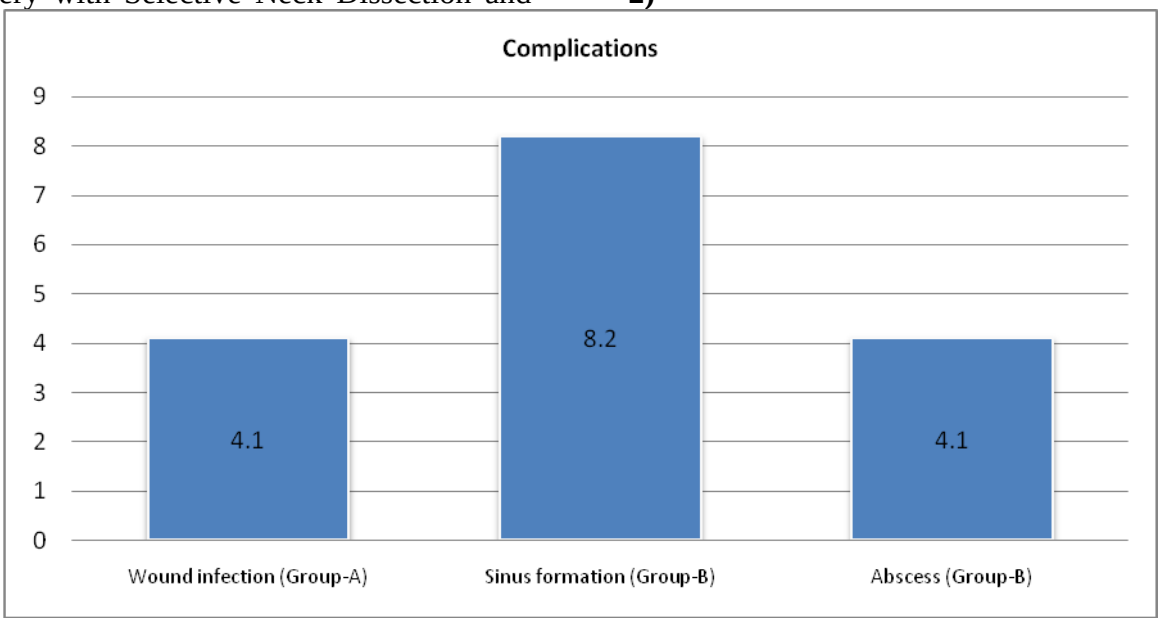

Figure 3: Evaluation of Complications in Tubercular Cervical Lymphadenopathy Treatment (n=48)

Figure 3 shows the complications observed in the study. In Group A, 4.1% (1/24) developed a wound infection, while Group B had three complications: two (8.2%) cases of sinus and one (4.1%) case of abscess formation. These

results suggest fewer complications in Group A compared to Group B. **(Figure 3)**

DISCUSSION

The findings of this study, comparing the outcomes of combined Selective Neck Dissection (SND) and Anti-Tubercular Therapy (ATT) with ATT alone for the treatment of retreatment cases of tubercular cervical lymphadenopathy, underscore the importance of surgical intervention in enhancing treatment outcomes. Our results indicate that Group A, which received SND followed by ATT, had significantly better outcomes compared to Group B, which received ATT alone.

The demographic characteristics of the patients in both groups were comparable, with no significant differences observed in age, gender, or residence. The mean age of the patients in both groups was nearly identical (Group A: 41.6 ± 7.2, Group B: 41.7 ± 7.4), and gender distribution was also balanced, with 34% males and 66% females. These findings are consistent with previous studies that report a higher prevalence of tubercular cervical lymphadenitis in middle-aged females [15,16]. Furthermore, the clinical symptoms of weakness, anorexia, and weight loss were commonly observed across both groups, without significant differences. These symptoms are typical of tuberculous lymphadenitis, which frequently presents with painless cervical lymph node enlargement that can progress to more severe forms if left untreated [7,17].

Lymph node involvement in both groups was similar in terms of location, with the majority of patients having right-sided lesions, as has been documented in previous studies [3,5]. Additionally, the lymph node size distribution showed no significant differences between the groups, with the majority of patients presenting with nodes sized between 3–6 cm, which is consistent with findings from earlier studies [6]. This similarity in lymph node characteristics between the groups suggests that the clinical presentation and severity of the disease were comparable across both treatment regimens.

Diagnostic methods, including Fine Needle Aspiration Cytology (FNAC) and Gene Xpert MTB/RIF, were pivotal in diagnosing tubercular cervical lymphadenitis. A positive FNAC result combined with a positive Gene Xpert test was found in the majority of patients, which aligns with findings from other studies highlighting the utility of these diagnostic tools in confirming the diagnosis of tuberculosis [18,19]. FNAC, along with Gene Xpert, provides high sensitivity and specificity, ensuring early and accurate diagnosis of tuberculous lymphadenitis [10]

The results of the treatment outcomes showed a clear advantage for Group A, which underwent SND followed by ATT. Group A had a significantly higher rate of complete resolution (95.83%) compared to Group B (75.0%), and a significantly lower recurrence rate (4.16% vs. 25.0%). These findings suggest that the addition of SND to ATT improves the treatment efficacy, preventing relapse and reducing the chances of persistent disease, as noted in several studies advocating for surgical intervention in tubercular cervical lymphadenopathy [20,12]. Surgical intervention may help in removing residual disease, leading to a more complete resolution of symptoms and a lower recurrence rate.

Interestingly, the complication rate was similar between the two groups, with only a slight increase in complications in Group B (12.5%) compared to Group A (4.16%). Although the difference was not statistically significant, this suggests that surgery does not significantly increase the complication rate, supporting the safety of selective neck dissection as a part of the treatment regimen [13]. This is consistent with findings from other studies that report low complication rates

following surgical interventions for cervical tubercular lymphadenitis [14,21].

CONCLUSION

In conclusion, the addition of Selective Neck Dissection to Anti-Tubercular Therapy in the treatment of retreatment cases of tubercular cervical lymphadenopathy significantly improves the cure rate and reduces the recurrence of the disease without increasing complications. These findings emphasize the potential benefits of incorporating surgery in the treatment of retreatment cases, particularly when medical therapy alone is insufficient. Further studies with larger sample sizes and longer follow-up periods are needed to further validate these findings and explore the long-term benefits of combined surgical and medical treatment for tubercular cervical lymphadenopathy.

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