INTERNATIONAL JOURNAL OF INTEGRATIVE AND MODERN MEDICINE

The Relevance and Necessity of Eliminating Postoperative Complications in the Treatment of Tuberculosis of Peripheral Lymph Nodes

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Annotation: The prevalence of Mycobacterium bovis-caused tuberculosis, including both the pulmonary and extrapulmonary forms, is rising annually. The most prevalent type of extrapulmonary tuberculosis is lymph node tuberculosis. Even though diagnosis is typically challenging, therapeutic management is nonetheless a problem and a topic of discussion both domestically and internationally. In a few chosen individuals, modern thoracic surgery may now manage tuberculosis and associated consequences with less morbidity and more efficacy than in the past. Importantly, more TB patients may be able to get operative treatment if improved less invasive thoracic surgical techniques reduce the requirements for surgical eligibility. The purpose of this study is to give a general overview of the role that contemporary thoracic surgery can play in the diagnosis and treatment of patients suffering from tuberculosis and its aftereffects. Treatment for peripheral lymph node tuberculosis (LNT) may result in postoperative complications such as lymphorrhea necessitating additional surgery and wound problems such as infection, cellulitis, and non-healing wounds. Careful wound care, early surgical surgery for specific lesions, careful antibiotic treatment, and handling paradoxical reactions are strategies to eradicate these problems. Although the choice of treatment is influenced by variables such as lesion size, abscess existence, and drug resistance, studies indicate that surgery can reduce the overall length of treatment. An overview of the role that contemporary thoracic surgery can play in the diagnosis and treatment of patients with tuberculosis and its aftereffects is what this article attempts to provide.

Keywords: Mycobacterium bovis, lymphorrhea, extrapulmonary tuberculosis, postoperative complications, immunocompromised patients, thoracic surgery.

Introduction. The evolution of tuberculosis (TB) treatment is inextricably linked to the history of thoracic surgery as a specialty. According to many surgeons, the earliest known chest surgery was most likely carried out by the Ancient Greeks. Hippocrates himself explained how to treat TB-related empyema thoracis with open pleural drainage. Koch's discovery of *Mycobacterium tuberculosis* in the 1880s marked the beginning of modern thoracic surgery as physicians know it today. Several collapse cures were created in the late 19th and early 20th centuries to kill the organism by oxygen deprivation after it was discovered that the microbe causing "consumption" was an obligatory aerobe. These included phrenic nerve crushing, ball plombage, pneumoperitoneum, induced pneumothorax, and thoracoplasty. Importantly, this period also saw the development of the majority of fundamental techniques and abilities still employed in contemporary thoracic surgery, such as the widely utilized

thoracotomy incision [1,2,3]. During this time, Jacobeus developed the technique of thoracoscopy for pleural biopsy and adhesiolysis in TB patients, which is where even less invasive thoracic surgery got its start. Most thoracic surgical procedures were now performed with TB control as the indication by the middle of the 20th century. Numerous important procedures carried out by thoracic surgeons today, such as thoracoscopy, thoracoplasty with muscle flaps, and lung resections, were first created to treat tuberculosis. However, a significant victory in contemporary medicine was the discovery and introduction of very efficient antimicrobial medication therapy for tuberculosis in the 1940s. Medical therapy quickly replaced surgery as the principal treatment for tuberculosis. This paradigm change in TB treatment was so extensive that it threatened the survival of thoracic surgery as a profession [4,5,6]. Thoracic surgery was only "rescued" from a sharp fall in the latter half of the century by the need to treat an increasing number of lung cancer patients. A wide variety of diagnostic and therapeutic indications are now covered by the enormous expansion of general thoracic surgery. It is appropriate, though, that tuberculosis has never entirely disappeared from the lengthy list of illnesses that thoracic surgeons treat. One could even argue that thoracic surgery for the treatment of tuberculosis has seen a resurgence in popularity in recent years. Three trends are primarily to blame for this. First, the global incidence of tuberculosis has actually increased rather than decreased as a result of contemporary medication therapy. The HIV epidemic, the rising survival rate of immunocompromised patients and the increased movement of people between TB-endemic locations could all contribute to this [7,8,9]. Despite this, the combination of antibiotic treatment and surgical excision yields positive outcomes. The outcomes of medical and surgical treatment have not been compared with those of medical treatment alone in any controlled research that we are aware of. In our setting, we increasingly encounter cases where patients develop new lymphadenopathies or maintain existing ones in spite of receiving effective medical care. Our study's primary objectives were to determine the reasons why medical treatment for LNT fails and to suggest surgical indications for cervical LNT in certain nations. Our secondary objectives were to determine the clinical and epidemiological traits of our patients. In order to diagnose and treat patients with tuberculosis and its aftereffects, this article attempts to give a general overview of the role that contemporary thoracic surgery can play [10,11,12].

The main purpose of the presented analytical manuscript is a brief commentary based on authoritative scientific research on the relevance and need to eliminate postoperative complications in the treatment of tuberculosis of peripheral lymph nodes.

Tuberculous lymphadenitis pathogenesis can be caused by an infection that spreads from the tonsils, adenoids, sinuses, or osteomyelitis of the ethmoid bone. Chest radiographs show expansion of the paratracheal and hilar lymph nodes, or both, in untreated primary tuberculosis. *M. tuberculosis* multiplies gradually during the early stages of superficial lymph node involvement. Significant hyperemia, node center edema, necrosis, and caseation are all present when delayed hypersensitivity first appears. Inflammation, increasing edema, and matting with other nodes in a group may ensue. Purplish coloring and induration may be the result of adhesion to the surrounding skin. The growing gland's center softens, and caseous material may burst through the skin and form sinuses or burst into surrounding tissue [1,4,8]. Major blood arteries, phrenic or recurrent laryngeal nerves, or the bronchus may expand and be compressed by tuberculous mediastinal lymphadenitis. Mycobacterium tubercular lymphadenitis can be acquired through a variety of portals of entry: Through the hematogenous and lymphatic spreading of the respiratory tract. Initially, the mediastinal and hilar lymph nodes are typically affected. When a TB infection affects the tonsils, adenoids, and Waldeyer's ring, it causes cervical lymphadenopathy, which travels down the lymphatics to the draining cervical lymph nodes. Consuming milk or sputum contaminated with *Mycobacterium bovis* or *M. tuberculosis* can result in abdominal tuberculous lymphadenopathy [5,6,11].

Method of diagnosis. A focused physical examination is necessary for any palpably swollen lymph node that has persisted for longer than two weeks. The approach should include looking for infectious, malignant, or other causes of the lymph node enlargement based on the clinical history. Aside from any previous cancers, exposure to recent insect or other animal bites, recent or recurring illnesses, travel-related exposures, environmental or industrial exposures, and risky sexual behavior are also important

components of the clinical history. For instance, 90% of individuals with cat scratch illness manifest with lymphadenopathy [9,12,13].

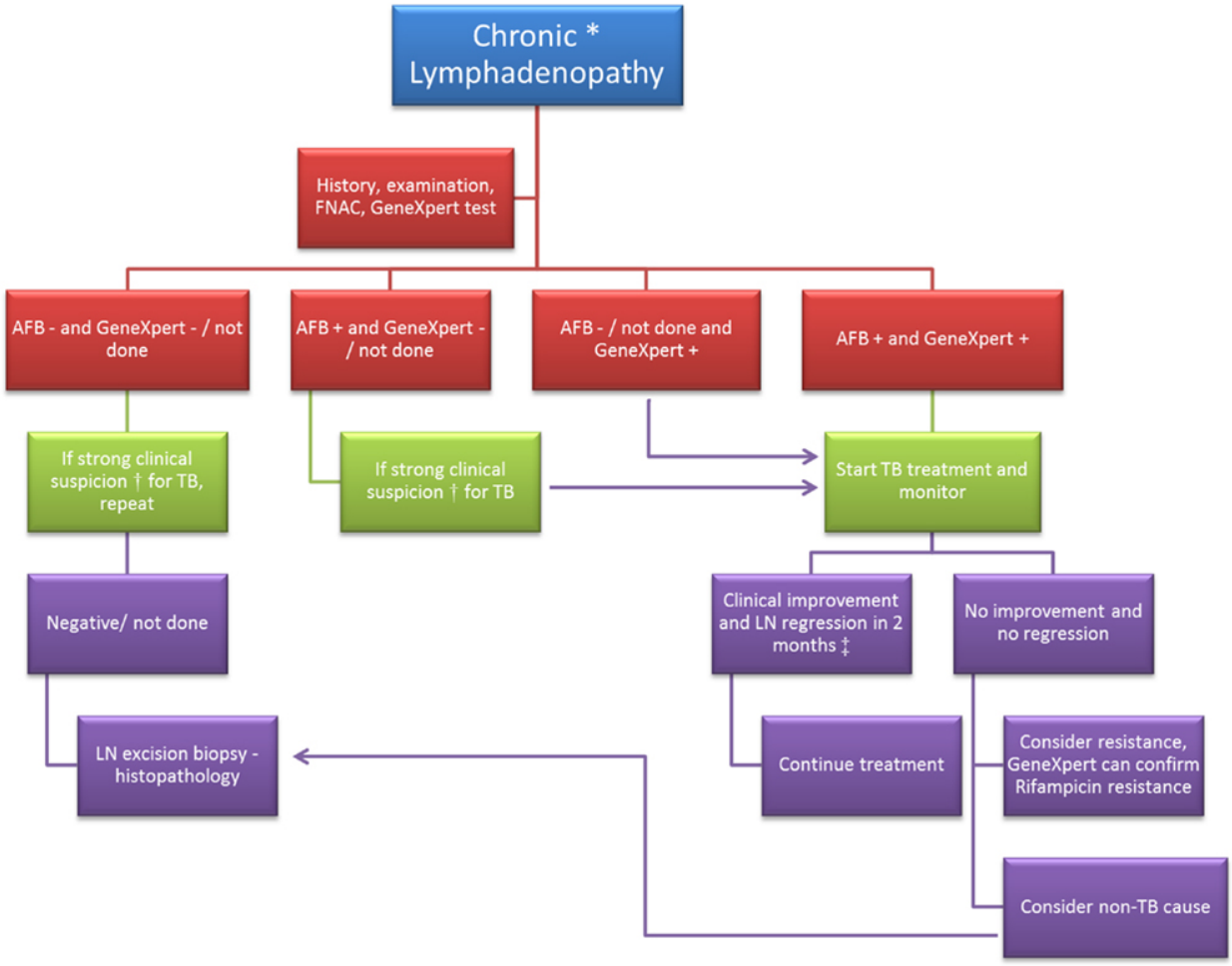

Figure 1. Algorithm for diagnosing persistent lymphadenopathy [16].

Allopurinol, atenolol, captopril, carbamazepine, certain cephalosporins, gold, hydralazine, penicillin, phenytoin, primidone, methylamine, quinidine, sulfonamides, and sulindac are among the drugs that might induce lymphadenopathy. Based on clinical observations and epidemiologic information, several attempts have been made to forecast which individuals would or would not benefit from biopsy; nonetheless, the predictive value has been subpar. An protocol for treating a persistent peripheral lymphadenopathy in adults is shown in Figure 1. Figure 1 summarizes the differential diagnosis of peripheral lymphadenopathy [16, 17].

The primary treatment for all patients with lymph node TB is still antibiotic medication; however, our research indicates that surgery may be beneficial in certain cases. In a few chosen individuals, modern thoracic surgery may now manage tuberculosis and associated consequences with less morbidity and more efficacy than in the past. Importantly, more TB patients may be able to get operative treatment if improved less invasive thoracic surgical techniques reduce the requirements for surgical eligibility. The purpose of this study is to give a general overview of the role that contemporary thoracic surgery can play in the diagnosis and treatment of patients suffering from tuberculosis and its aftereffects [11-14]. The presence of LNTB symptoms and indicators along with at least one of the following—positive microscopy for AFB, positive culture for M. tuberculosis, or positive validated polymerase chain reaction (PCR)-based test (e.g., GeneXpert MTB/RIF)—defines a microbiologically proven LNTB case. When symptoms and indicators of lymph node tuberculosis are present along with negative microscopy, negative culture, and PCR-based test results, no other diagnosis can account for the symptoms, radiological evidence suggestive of LNTB with or without histological findings, and clinical features suggestive of tuberculosis, the condition is clinically

diagnosed as LNTB. The main treatment for LNTB is medication, and the results of additional surgical excision are typically worse. For peripheral LNTB, a six-month ATT standard first-line regimen is advised; in certain countries, this can be obtained at the closest local directly observed treatment short-course chemotherapy clinic [15-18]. The first two months of the intensive phase consist of a four-drug regimen consisting of ethambutol, pyrazinamide, rifampicin, and isoniazid (INH). The continuation phase, which includes three-drug regimens (INH, rifampicin, and ethambutol), begins in the second month and lasts for four months, for a total of six months of therapy. At four months, the response to ATT is evaluated. Patients who have gotten worse or worse after first improving should be evaluated for potential therapy failure. In these situations, additional research is necessary to detect medication resistance and alternative diagnoses, which should be followed by a suitable treatment modification. Paradoxical reactions may be the cause of deterioration within the first three months; this does not necessitate additional diagnostic testing or a change in treatment [1-4]. Challenges in managing lymph-node tuberculosis in addition to the challenges in diagnosing the disease, which were previously discussed. These challenges may arise during treatment and include the development of new lymphadenopathy, enlargement of the existing nodes, fluctuation, formation of sinus tracts, residual lymphadenopathy following treatment, or relapse. Poor patient compliance with treatment, unknown drug resistance, poor drug penetration into the lymph node or absorption, an unfavorable local milieu, a nontuberculous mycobacterial infection, an enhanced delayed hypersensitivity reaction to mycobacterial antigens released during medical treatment of the disease, a superadded infection, drug resistance (INH mono-resistance/multidrug resistant TB), or an alternative underlying diagnosis are some possible explanations for this suboptimal response to therapy in lymph-node tuberculosis [5-10].

Prognosis and complications. After treatment, some LNTB patients still experience lymphadenopathy. When the largest node is less than 1 cm in size, this is typically not the result of an ongoing active TB infection. Patients are categorized as partial responders if they have residual nodes larger than 1 cm. It is unclear if it is advantageous to keep these individuals receiving ATT. According to the INDEX TB guidelines, these patients should continue taking Rifampicin, Isoniazid, and Ethambutol (RHE) for three more months before having a biopsy submitted for TB culture and histology [3-9]. Chest X-rays can be used to track ATT progress for mediastinal TB, but if lymph nodes do not shrink in size after four months, a CT scan could be necessary. The alternative diagnosis of lung cancer, lymphoma, sarcoidosis, and fungal infection should be taken into consideration for individuals who do not improve with ATT. Under all aseptic measures, aspiration is required when fluctuation appears in one or more lymph nodes. It is important to treat any subsequent bacterial infection properly, which may need drainage and incision. If the condition worsens after eight weeks of treatment, en bloc excision of the affected lymph node chain may be necessary to prevent unsightly sinus tracts. Surgery to repair nonhealing sinus tracts may be necessary. Surgery to repair nonhealing sinus tracts may be necessary. The causal agent should be isolated as much as possible, and sensitivity testing should be obtained as soon as possible, especially in situations of relapse or nonresponders, and treatment should be adjusted accordingly [10, 14].

Discussion. Any anomaly in the size, consistency, or morphology of one or more lymph nodes is referred to as lymphadenopathy. Despite the fact that lymphadenopathies are frequently seen in routine clinical practice, therapeutic methods may be delayed due to the challenge of distinguishing benign from malignant disease. Based on the body of existing literature, the current review attempts to update diagnostic algorithms in various clinical scenarios. The diagnostic approach was updated and current knowledge was evaluated by a study of the literature. To illustrate a typical clinical presentation, a brief clinical scenario was employed. This instance of metastatic lymphadenopathy with an unfinished medical history shows how deceptive this type of lymphadenopathy may be, resulting in a delayed diagnosis and potentially lethal consequences [1-4]. Any lymphadenopathy that lasts longer than two weeks is cause for concern and warrants additional research. The diagnosis of the condition's etiology still relies heavily on a thorough history, a precise clinical examination, and a search for related symptoms. The anatomical location and the circumstances of the particular patient determine the next diagnostic stage. Ultrasound is the first imaging modality, while magnetic resonance imaging (MRI)

and computed tomography (CT) provide evaluation of the surrounding structures. Tissue sampling and histological examinations ought to be carried out if the diagnosis is still unclear [5-8]. All age groups frequently present with peripheral lymphadenopathy, which frequently presents a difficult decision when it comes to biopsy. Most of the time, a thorough clinical knowledge can prevent an unneeded biopsy; this is especially true if facilities like USG and FNAC are available. But not everyone has access to these. When the patient follow-up is dubious, it becomes desirable to take into account this alternative given the background knowledge of common potentially curable diseases in the population, such as tuberculosis. The most aberrant node, which may not be the easiest to reach, should also be biopsied. We conclude that open lymph node biopsy is a useful diagnostic tool in a peripheral setup due to its ease of use, high diagnostic yield, and lack of major morbidity or mortality [9-14]. For lymph node TB, antibacillary chemotherapy is the primary treatment. We advise the excision of fistulas, abscesses, and adenopathies larger than 3 cm in diameter based on our expertise. In cases of paradoxical upgrading reaction, antibacillary medication resistance, and recurrence, lymph node dissection is also recommended. Patients' quality of life is improved, morbidity is decreased and complications like the disease spreading to other organs are decreased when surgery is performed on these patients early. To assess these results and suggest changes to these suggestions, they must be applied in other works [15-18].

Conclusion. Children and adolescents with swollen lymph nodes should be evaluated for *M. tuberculosis* infection following splenectomy. Children who have had splenectomy should be screened for *M. tuberculosis* infection first since they are a high-risk group. Although diagnosing tuberculous lymphadenitis is difficult, treating it may be even more difficult because many patients had recurring swelling of the lymph nodes even during or after previously successful therapy. To confirm the diagnosis of tuberculous lymphadenitis, early excisional biopsy and PCR-based *M. tuberculosis* identification should be performed.

The primary treatment for lymph node tuberculosis is antibacillary chemotherapy. Based on our expertise, we advise removing fistulas, abscesses, and adenopathies larger than 3 cm. Dissection of the lymph nodes is also recommended in cases of paradoxical upgrading reaction, recurrence, and resistance to antibacillary medications. In these individuals, early surgical surgery lowers morbidity, improves quality of life, and prevents complications like the disease spreading to other organs. To assess it and suggest changes to these recommendations, these results must be applied in other activities.

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