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Cervical Lymph Node Tuberculosis: A Report of 171 Cases Collected at the CDTMR of the Hay Hassani Prefecture in Casablanca

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Abstract **Case Report**

Cervical lymph node tuberculosis (CLNT) is the most frequent form of extrapulmonary tuberculosis, particularly in endemic countries such as Morocco, where diagnosis may be challenging due to its nonspecific clinical presentation. This retrospective descriptive and analytical study aimed to describe the epidemiological, clinical, paraclinical, therapeutic, and evolutionary characteristics of CLNT cases managed at the Center for the Diagnosis and Treatment of Respiratory Diseases (CDTMR) of the Hay Hassani Prefecture in Casablanca. A total of 171 patients treated for CLNT between January and December 2024 were included. The mean age was 31.1 years, with a male predominance. General symptoms were present in most patients, and jugulo-carotid lymph node involvement was the most common localization. Cervical ultrasound systematically revealed necrotic and confluent lymphadenopathies with periadenitis in the majority of cases. GeneXpert MTB/RIF was performed in most patients, with a high positivity rate, particularly when fresh tissue samples were used, and histopathology confirmed granulomatous inflammation with caseous necrosis in nearly all cases. Chest radiography showed isolated lymph node involvement in most patients, with associated pulmonary tuberculosis in a minority. All patients received antituberculous therapy according to national guidelines, with good tolerance and rare adverse effects. Surgical intervention was required in selected cases, mainly for diagnostic confirmation or residual lesions. Clinical outcomes were favorable in over 96% of patients, with no reported deaths or confirmed therapeutic failures. These results confirm that CLNT remains a common condition in Morocco and highlight the essential role of combined clinical, imaging, bacteriological, and histological approaches in ensuring early diagnosis and optimal management.

Keywords: Cervical lymph node tuberculosis, Extrapulmonary tuberculosis, Lymphadenitis, GeneXpert MTB/RIF, Ultrasound, Antituberculous treatment, Morocco.

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. It remains a major global public health issue, particularly in low- and middle-income countries. Although pulmonary tuberculosis is the most common form, extrapulmonary presentations especially lymph node involvement represents a substantial proportion of cases, particularly in endemic regions such as Morocco.

Cervical lymph node tuberculosis (CLNT) is the most frequent extrapulmonary form of tuberculosis, notably in high-burden countries like Morocco. Its clinical presentation is often misleading and requires thorough diagnostic evaluation.

In Morocco, the notification of pulmonary tuberculosis (PTB) has increased significantly over the past four decades. The number of new cases rose from 5,700 in 1980 to 13,800 in 2021, corresponding to an estimated average annual increase of 2.3%. The proportion of PTB among all newly reported cases also

increased, rising from 24% in 1980 to 49% in 2021, with an average annual increase of 1.6%.

According to World Health Organization (WHO) estimates, the national incidence of tuberculosis (all forms combined) was 93 cases per 100,000 inhabitants in 2022 approximately 35,000 cases of which 47% were extrapulmonary. The National Tuberculosis Control Program (PNLT) reported 29,327 new cases in 2022, representing an incidence of 80 cases per 100,000 inhabitants, with the same proportion (47%) of extrapulmonary forms. For 2023, World Bank estimates indicated a national incidence close to 92 cases per 100,000 inhabitants, a trend expected to persist into 2024.

Clinically, PTB remains the most frequent presentation (around 51% of hospitalized cases according to retrospective studies). However, extrapulmonary forms have increased, with reported rates ranging from 20% to 38% for lymph node TB, approximately 5% for osteoarticular TB, and 10% for meningeal TB.

National therapeutic success rates remain high (87–90%) according to PNLT and WHO data.

In 2023, the Ministry of Health initiated the implementation of the new National Strategic Plan 2024–2030, continuing the 2021–2023 plan. The strategy focuses on strengthening TB control through improved screening, management, and action on social and economic determinants, with the goal of reducing TB-related mortality by 60% by 2030 compared with 2015.

The aim of this study is to describe the epidemiological, clinical, paraclinical, therapeutic, and evolutionary characteristics of CLNT cases managed at the Center for the Diagnosis and Treatment of Respiratory Diseases (CDTMR) of the Hay Hassani Prefecture in Casablanca over the period 2024–2023.

METHODOLOGY

This is a retrospective, descriptive, and analytical study including 171 patients treated for cervical lymph node tuberculosis (CLNT) at the CDTMR Hay Hassani in Casablanca over a one-year period (January 1 to December 31, 2024).

Patient medical records were reviewed using a pre-established standardized data-collection form routinely used in the department. The form included sociodemographic, clinical, biological, radiological, histological, therapeutic, and follow-up variables. Data collection was performed anonymously and with full respect for confidentiality.

Inclusion criteria consisted of patients of any age and sex presenting with cervical lymphadenopathy and diagnosed with CLNT, confirmed either by bacteriological testing or retained based on consistent clinical, radiological, and/or biological evidence.

The analyzed parameters included age, sex, medical history (HIV, diabetes, hypertension, renal impairment), TB exposure, general symptoms (low-grade fever, night sweats, weight loss), lymph node topography, clinical features (pain, fistula), results of complementary examinations (TST, GeneXpert from fine-needle aspiration or biopsy, histopathology, cervical ultrasound, chest radiography), therapeutic management (regimen, duration, surgical intervention), clinical follow-up, and adverse events.

Data were entered and analyzed using Microsoft Excel 2016. Qualitative variables were expressed as percentages, while quantitative variables were presented as mean ± standard deviation. Comparative analysis between at-risk and non-risk groups was considered.

RESULTS

1. Demographic data

The cohort included 171 patients with CLNT: 101 males (59.1%) and 70 females (40.9%), with a mean age of 31.1 years (range: 2–82 years). Children under 15 years accounted for 13 patients (7.6%).

2. Medical history and risk factors

Among included patients, TB exposure was identified in 51 cases (29.8%), and 10 patients (5.8%) reported a personal history of TB. Smoking was common, found in 78 patients (45.6%). Surgical history was noted in 14 patients (8.2%).

Comorbidities included hypertension (17 cases, 9.9%), diabetes (9 cases, 5.2%), HIV infection (3 cases, 1.75%), treatment-induced immunosuppression (2 cases, 1.1%), and chronic kidney disease including one case on hemodialysis reported in 1 patient (0.6%). One case of silicosis was documented (0.6%).

3. Clinical presentation

General symptoms were present in 144 patients (84.2%), though often mild. Asthenia was the most frequently reported symptom. Discrete weight loss was noted in 111 patients (64.9%).

Right-sided lymphadenopathy predominated (103 cases, 60.2%), followed by the left side (98 cases, 57.3%), with bilateral involvement in 30 cases (17.5%).

Cutaneous fistulization occurred in 14 patients (8.2%), typically reflecting prolonged evolution or delayed management. A paradoxical reaction was observed in only 3 patients (1.75%).

4. Paraclinical investigations

Ultrasound, performed in all patients, revealed predominant involvement of the jugulocarotid chain in 145 cases (84.8%), with right-sided predominance (103 cases, 60.2%) compared with the left side (98 cases, 57.3%). Bilateral involvement was found in 30 cases (17.5%).

Less frequent lymph node locations included spinal lymph nodes (5 cases, 2.9%) and subclavicular nodes (4 cases, 2.3%).

Morphologically, lymph nodes were predominantly hypoechoic with necrosis in 125 cases (73.1%). Peripheral Doppler hypervascularization was present in 117 cases (68.4%), a typical feature of tuberculous lymphadenitis.

Periadenitis was observed in 102 cases (59.6%), presenting as thickened periganglionic tissues and confluent lymphadenopathies. Abscess formation was seen in 29 cases (17%), sometimes complicated by fistulization (14 cases, 8.2%). Calcifications were noted in 11 cases (6.4%).

Based on ultrasound classification, necrotic and confluent forms with periadenitis were the most common (~60%), followed by abscessed forms (17%) and calcified forms (6.4%).

Chest radiography, systematically performed, was normal in 153 cases (89.5%) and showed findings suggestive of pulmonary TB in 18 cases (10.5%). Thus, CLNT was isolated in 150 patients (87.7%), and associated with pulmonary or extrapulmonary involvement in 21 patients (12.3%).

5. Confirmatory examinations

GeneXpert MTB/RIF was performed in 162 patients (94.7%), yielding 142 positive results (83%). Among these, the diagnosis was based on fresh lymph node tissue in 92 cases (56.7%) and on cytopuncture material in 35 cases (21.6%). Culture confirmed the diagnosis in 15 cases (9.3%).

In 32 patients (18.7%), the diagnosis was retained based on converging clinical, radiological, and biological findings in the absence of direct bacteriological confirmation.

Fresh or physiologic-solution–preserved samples showed significantly higher diagnostic sensitivity compared with GeneXpert performed on fixed tissues.

Histopathological examination, obtained in 160 cases (93.5%), confirmed granulomatous inflammation with caseous necrosis.

6. Therapeutic management

Treatment followed PNLAT recommendations: a 2-month intensive phase with isoniazid, rifampicin, pyrazinamide, and ethambutol (RHZE), followed by a 4-month continuation phase with rifampicin and isoniazid (RH). Duration was adjusted according to clinical and radiological evolution: 4 months in 80.7% of cases, 6 months in 11.1%, and 9 months in 8.2%.

In children under 15 years with isolated lymph node TB, a short 4-month regimen (2RHZ/2RH) is recommended, with possible extension if clinical evolution is unfavorable.

Surgical lymph node excision was required in 23.9% of cases, mainly for residual masses and to obtain histological confirmation.

Paradoxical reactions, characterized by transient enlargement or inflammation of lymph nodes during treatment, were observed in a few patients and did not require treatment interruption.

Treatment tolerance was good overall, with only 5.2% experiencing minor adverse effects (pruritus, rash, nausea) and no major adverse events.

7. Clinical outcomes

Clinical evolution was favorable in 165 patients (96.5%), based on strict clinical and paraclinical criteria: reduction in lymph node size, complete disappearance of lymphadenopathy, absence of necrosis or periadenitis on ultrasound, and full healing of fistulas when present.

Among the remaining 6 patients (3.5%), three discontinued treatments prematurely, while three others had insufficient clinical response requiring further investigation. GeneXpert performed in these cases did not show rifampicin resistance.

No confirmed therapeutic failures or deaths were reported. Overall treatment tolerance was satisfactory.

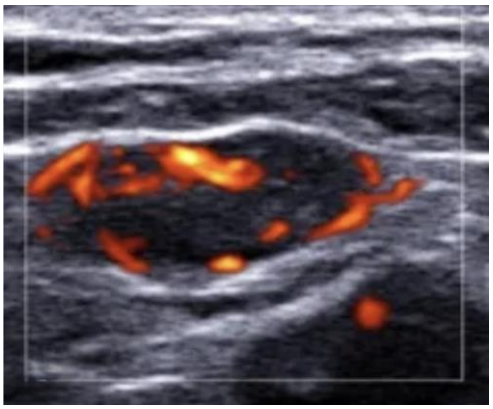

Figure 1: Peripheral Doppler Vascularization of a Cervical Tuberculous Lymph Node

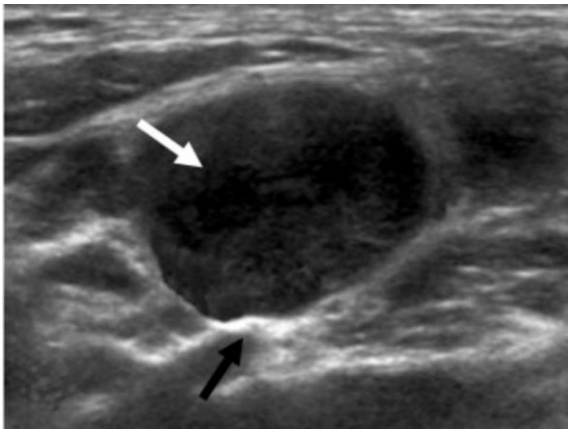

Figure 2: Ultrasound Appearance of a Tuberculous Lymph Node: Necrotic Node with a Hypoechoic Center and a Hyperechoic Capsule

Figure 3: Sabir L., CDTMR Hay Hassani – Cervical Mass Suggestive of Cervical Tuberculous Lymphadenopathy

Figure 4: Sabir L., CDTMR Hay Hassani – Cutaneous Fistulization of a Cervical Tuberculous Lymphadenopathy

DISCUSSION

Cervical tuberculous lymphadenitis (TBL) is the most common extrapulmonary form of tuberculosis, accounting for up to 35–40% of extrapulmonary cases according to the WHO [1]. The cervical region remains the predominant site of involvement, which justifies the relevance of this study focused on cervical tuberculous lymphadenopathy (CTL) in a Moroccan reference center.

Epidemiology

This study reports a male predominance (60%), consistent with several African and Asian series, although some studies have described a slight female predominance, particularly in low-income countries [2]. The mean age of 30 years aligns with the demographic profile commonly reported in endemic regions. A history of TB exposure was identified in 35% of cases, highlighting the importance of contact tracing around index cases.

Comorbidities

Associated comorbidities (hypertension, diabetes, HIV infection, renal insufficiency) were present in approximately 25% of patients. The prevalence of HIV infection was low (3.3%), reflecting the current epidemiological situation in Morocco, where HIV/TB coinfection remains relatively controlled [3].

Clinical Presentation

General symptoms were very common (81.6%), mainly asthenia, moderate fever, and night sweats. Weight loss was noted in 66.6% of cases, a characteristic feature of chronic lymph node tuberculosis. Diagnosis was primarily based on painless cervical lymphadenopathy, isolated or multiple, most frequently in the jugulo-carotid region, with a right-sided predominance.

Associated localizations (pulmonary, pleural, or peritoneal) were identified in 10% of cases, emphasizing the need for a systematic evaluation, including a chest X-ray even in the absence of respiratory symptoms.

Paraclinical Investigations

Cervical ultrasound was systematically performed, allowing precise mapping of lymph node involvement (jugulo-carotid in 81.6%) and guiding sampling procedures. Ultrasound remains essential to differentiate necrotic collections from compressive forms.

GeneXpert MTB/RIF testing was performed in 96.6% of patients, with a positivity rate of 86.6%, confirming its high sensitivity in lymph node specimens, consistent with the literature (sensitivity between 83% and 90% on biopsy tissue [4]).

Tuberculin skin testing (TST) was positive in 86.6% of cases, supporting its diagnostic value in endemic regions, although interpretation remains difficult in BCG-vaccinated individuals.

Histopathology was conclusive in 98.3% of cases, with typical findings of epithelioid granulomas and caseous necrosis, confirming its role as a diagnostic reference.

Treatment

The therapeutic protocol applied at the CDTMR of Hay Hassani was fully consistent with national guidelines. In adults, treatment consisted of a 2-month intensive phase with RHZE followed by a 4-month continuation phase with RH, resulting in a total duration of 6 months in 91.6% of cases. Complicated or refractory forms required extended treatment up to 9 months (6.6%).

In children under 16 years, a shorter 4-month regimen (2RHZ/2RH) was used for isolated lymph node forms, with possible extension based on clinical response.

Overall, the therapeutic response was excellent, with favorable outcomes in 96.6% of patients.

Side Effects and Complications

Treatment-related adverse effects were infrequent, mild, and transient (digestive symptoms, cutaneous rash). No severe adverse events requiring treatment discontinuation were reported.

A paradoxical reaction defined as transient or recurrent clinical or radiological worsening during adequate treatment was observed in 3 patients (5%). This reaction reflects an exaggerated immune response to antigens released during bacillary destruction, particularly in cases with high antigenic load.

Although its exact mechanism remains unclear, it is thought to result from immune reconstitution phenomena. Management is generally symptomatic, with corticosteroids reserved for significant inflammation. Importantly, antituberculous therapy must be continued without interruption.

In this study, paradoxical reactions required either prolonged treatment duration or surgical lymph node dissection to manage residual lesions and prevent complications.

Lymph node dissection (23.3%) was indicated in suppurative, compressive, or treatment-resistant lymph nodes, or when aspiration was insufficient.

Outcome

The favorable outcome rate (96.6%) is comparable to major international series, confirming the high effectiveness of standard treatment when properly adhered to. Non-favorable cases required diagnostic

reassessment, therapeutic adjustment, or surgical intervention.

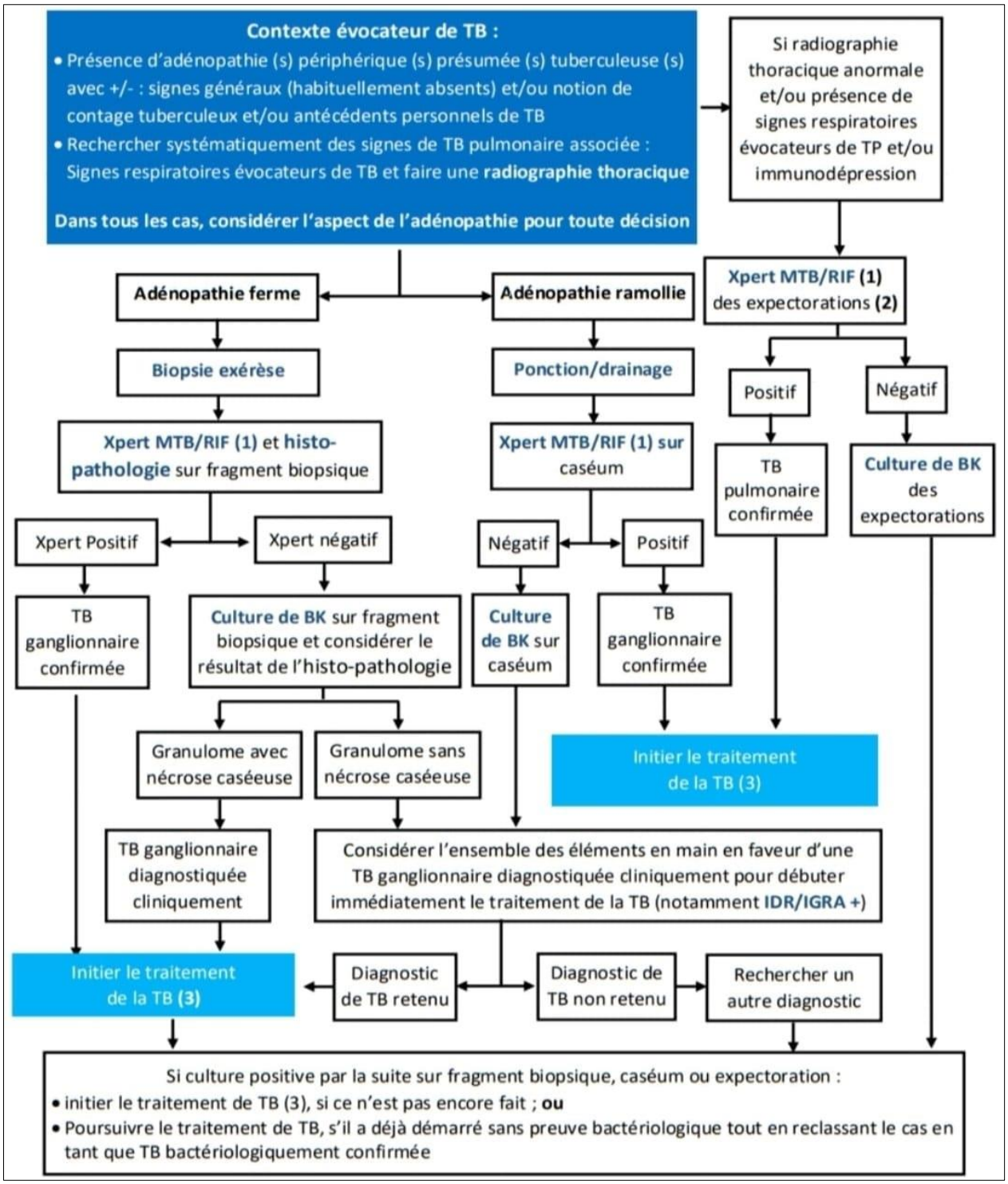

Figure 5: Algorithm for the management of presumed tuberculous peripheral lymphadenopathy

CONCLUSION

Cervical tuberculous lymphadenitis remains a common condition in Morocco. This study confirms the predominance of jugulo-carotid involvement, the essential contribution of complementary investigations (GeneXpert and histology), and the excellent therapeutic response in most cases. Early identification of at-risk patients and tailored follow-up are crucial to optimizing management.

Despite its frequency, cervical tuberculous lymphadenitis requires early diagnosis and an appropriate therapeutic strategy. The CDTMR of Hay

Hassani applies effective protocols that ensure an excellent prognosis.

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