

# Cervical lymph node tuberculosis in the Moroccan Saharan environment (experience of the Guelmim oued Noune region): diagnostic and therapeutic approach

N. Belhaj <sup>1\*</sup>, R. Bencheikh <sup>1</sup>, M.A. Benbouzid <sup>2</sup>, L. Houassaini.Essakalli <sup>2</sup>

<sup>1</sup>CHR Guelmim; ENT department. Morocco.

<sup>2</sup>ENT Department CHU ibn sina Rabat. Morocco.

\*Corresponding Author: N. Belhaj, CHR Guelmim; ENT department. Morocco.

Received Date: May 16, 2024 | Accepted Date: November 20, 2024 | Published Date: November 28, 2024

**Citation:** Belhaj N, Bencheikh R, M.A. Benbouzid, L. Houassaini.Essakalli, (2024), Cervical lymph node tuberculosis in the Moroccan Saharan environment (experience of the Guelmim oued Noune region): diagnostic and therapeutic approach, *International Journal of Clinical Case Reports and Reviews*, 20(1); DOI:10.31579/2690-4861/475

**Copyright:** © 2024, N. Belhaj. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Abstract:

Tuberculosis is a contagious infectious disease caused by a mycobacterium of the tuberculosis complex, mainly mycobacterium tuberculosis or Koch's bacillus.

It remains a public health problem in the world responsible for a high mortality and morbidity. Lymph node tuberculosis is the most common extranodal form; it is a real diagnostic, therapeutic and aesthetic problem despite the current effectiveness of anti-bacillary chemotherapy.

The objective of our study was to analyze the epidemiological, clinical, therapeutic and evolutionary aspects of cervical lymph node tuberculosis in the Guelmim Oued Noun region in order to improve its management; to a retrospective study on a series of 30 patients collected over a period of 2 years.

**Key words:** cervical lymph node tuberculosis; mycobacterium tuberculosis; surgery; antibacillary

## Introduction

Tuberculosis remains a major public health problem worldwide, causing high mortality and morbidity.[1] About one-third of the world's population is infected with the tuberculosis bacillus, and more than nine million new cases of tuberculosis occur worldwide each year. In Morocco, 26,000 to 27,000 new cases of tuberculosis of all forms are detected annually. [2]

Tuberculosis presents itself in different clinical forms, most often pulmonary, but in 25% of cases it is extra-pulmonary, dominated by lymph node tuberculosis, particularly cervical lymph node tuberculosis formerly known as scrofula: a term derived from Latin for "glandular augmentation". This represents 43% of lymphadenopathy in developing countries and 5 to 10% in developed countries. [3]

The infectious origin of 'scrofula' was put forward by Bollinger, May and Demme towards the end of the 19th century; indeed, they noted that Mycobacterium bovis affecting cows was the cause of this disease. Lymph node tuberculosis (TG) is the most common extrapulmonary

location in Morocco. It continues to pose diagnostic, therapeutic and aesthetic problems. [5,6]

It is a pauci-bacillary form, the diagnosis is essentially based on cytohistology; Standard microbiology remains the key test for determining the causative agent of lymph node tuberculosis and testing its susceptibility to anti-bacillary therapy. However, molecular biology has undergone technological progress, making new means of diagnosing tuberculosis available to the clinician. [5] Clinically, it appears as a bulky mass, polylobed with a pseudotumoral appearance, these are most often unilateral polyadenopathies of unequal consistency under the mandibular or spinal systems; of fluctuating appearance or in prefistulization, which is strongly suggestive of BK.

The treatment is essentially medical, the duration of which is still a matter of controversy; while surgery retains a preponderant place for diagnostic as well as therapeutic purposes, sometimes indicated from the outset in certain specific situations. [7]

The main objectives of our study are:

- To study the epidemiological, diagnostic and therapeutic profile of lymph node tuberculosis in the Saharan region, more specifically the region of Guelmim Oued Nour being described as the largest region in the Sahara.

-To discuss the interest of surgery as a diagnostic and therapeutic means in the treatment of management of BK lymph node

-- Evaluate the effectiveness of current management to derive new strategies to fight this disease

## Materials & Methods

Il s'agit d'une étude retrospective réalisée sur une période de 2 ans du 1er Mai 2022 au Mai 2024.

Including 30 patients with the following inclusion criteria:

Selected patients are those with cervical lymph node tuberculosis confirmed by the demonstration of gigantocellular epitheloid granuloma with caseous necrosis and a positive expert gene.

Excluded patients are those with no histological confirmation, those who are lost to follow-up and whose records are incomplete. Data entry was done in Word and Excel.

The statistical study was done using the Jamovi

Regarding the epidemiological results:

Gender was found to be predominant: 14 (46.7%) male via 16 female (53.33%)

The average age of our patients was 28 years old, with the extreme age of 10-59 years.

Geographical origin: rural origin in 33% while urban origin in 70%.

For: Personal history of lymph node or extranodal tuberculosis (no cases had been identified); The notion of tuberculosis contagion found in 66% of cases; Smoking was a toxic history found in 12 patients in our series and alcoholism in 3 cases All of our patients consumed unpasteurized milk, mostly good milk. All patients in our series are vaccinated (i.e. 100% of cases).

The frequent reason for consultation in all our patients was cervical swelling with fistulization in only 8 cases (26.7%). (Figure 1.2) For the signs of tuberculous impregnation, we noted at least one sign in 42% of our patients while they were absent in the rest.



**Figure 1.2:** Clinical aspects of cervical masses in pre-fistulization and fistulism

In addition, only one patient in our series presented other signs suggestive of a malignant pathology, but cytology had reconfirmed the diagnosis to the type of reflex otalgia; of odynophagia see dysphagia.

On clinical examination, a single lymphadenopathy was found in 12 of the patients, while the remaining 18 polyadenopathy were highlighted.

The size of the ADPs varied between 11 mm and 80 mm; the most affected cervical sector was the upper jugulocarotid; the consistency of the ADPs varied from hard in 2 patients (6.7%); closed 13 patients (43.33%); soft in 8 cases (26.7%) and phlyctenular in 23.3%.

The skin was normal in 78.57% of cases, inflammatory in 10% of patients and fistulized in 11.42% who remain. No other ENT or extra ENT locations found

As far as the paraclinical examinations are concerned, all our patients benefited from a chest X-ray which was normal in the majority except for two patients who presented hialair but non-specific opacities.

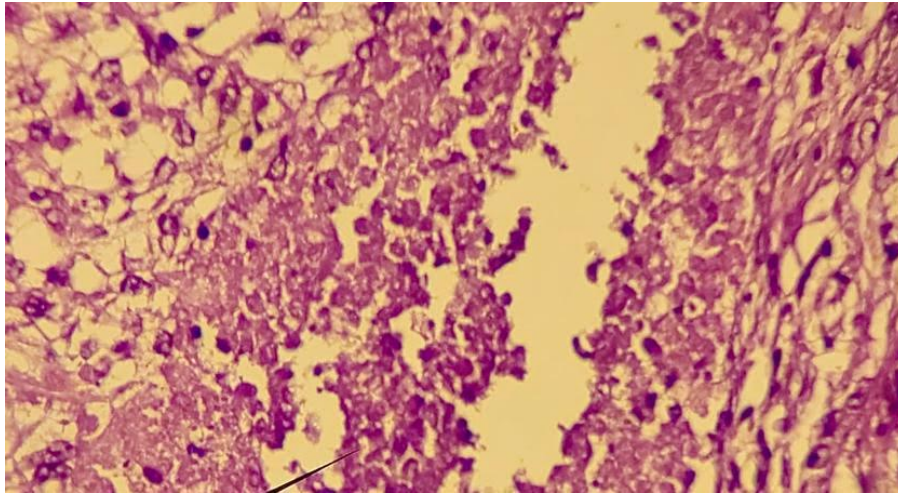
Cervical ultrasound was performed in all our patients in order to study lymph node involvement with different aspects noted (homogeneous

hypoechoic aspects; necrosis images found in 88% of patients a hyperechoic appearance in 11% of cases).

CT scan is requested in 3 cases to explore the lymph node areas and their relationship with the vascular axes, in these cases a case of SCM infiltration. All our patients had received an objective blood count: anemia in 10 cases; hyperleukocytosis at the expense of lymphocytes in 4 patients. The CRP requested in all patients was elevated in 5 patients.

Intradermoreaction was performed in 20 patients due to the unavailability of the reagent at the respiratory disease diagnostic center and dispensaries for the duration of the study.

Quantiferon assay not performed in all patients, examination not available in the regional hospital. HIV serology: all our patients benefited from a rapid HIV test, it was positive in 2 patients, the confirmation carried out by serology. Bacteriological and histological confirmation carried out after exploratory cervicotomy objectifying an epitheliogigant granuloma in all our patients; None of our patients have benefited from a needle aspiration. The expert gene study carried out in all patients looking for resistance did not objectify any case of resistance.(figure 3)



**Figure 3:** histological blade showing the epitheliogigant granuloma

All our patients had benefited from an exploratory cervicotomy with an incision that depended on the site of the lymphadenopathy. For the evolution under antibacillary medical treatment was marked by a paradoxical reaction in two patients and a prodigious scar in 5 patients.

### Discussion:

In our series, cervical lymph node tuberculosis was the prerogative of young adults; the average age in our series is 29 years old, which is in line with the literature; the data from the R. Bouchentouf series where the average was 26 years [8] and with the T. Habiba series the average was 29 years [9]; while the average age reached 36 years in a study carried out at Fkih ben Saleh. [10]

For sex in our series, a slight predominance of women as described in the literature [2.14.11.12]

According to the literature, active and passive smoking increases the risk of latent tuberculosis infection and tuberculosis disease in their pulmonary and extrapulmonary forms by:

(Alteration of mucociliary clearance; Decreased performance of alveolar macrophages. Decreased cytotoxic activity of 'Natural killer' cells; Decreased cytotoxic activity of Natural killer cells) [13]

Smoking cessation should be an integral part of the management of patients with tuberculosis. [14.15.16].

In our study, the notion of consumption of unpasteurized milk concerned 100% of cases, which was higher than the data in the literature. Indeed, in R. Abdelmalek's study, it was present in 16.96% of cases [17] and was

reported in 13.46% of cases by N. Jihane in his study. [14] The danger of consuming milk from tubercular cows has been demonstrated for a very long time. Although the bovine tuberculosis bacillus and the human bacillus are not identical, It has been definitively established, following numerous and important studies, that the bovine bacillus could cause in man the same tuberculous lesions as the human bacillus. This was the conclusion reached in 1942 by the work of the Medical Research Council (Report of the Tuberculosis Committee, No. 246).

In Canada (in 1934), PRICE, studying the case of 300 tuberculous children under fourteen years of age, established that 15% of cases of extra-pulmonary tuberculosis were due to the bovine bacillus. (The infected children came from areas where milk was not pasteurized. No cases of bovine infection were detected in children fed pasteurized milk) (18)

Even if the diagnosis of extra-pulmonary tuberculosis is made, it is always necessary to look for an associated pulmonary location given the endemic state in our country. In our series, the notion of tuberculosis contagion was reported in 66%. As for the series by N. Jihane, R. Abdelmalek and G. Hamzaoui, it was reported in 5.76% and 3.9% and 9% respectively [14, 17, 2].

The tuberculosis vaccine is a live attenuated vaccine that does not prevent infection but protects against severe forms of the disease (meningitis, miliaria) in young children (70% to 80%). [53] The degree of protection conferred by BCG (Bacillus of Calmette and Guérin) with regard to pulmonary tuberculosis in adults is limited. The average duration of protection is 10 to 15 years. In our series, all patients are vaccinated and this shows the efforts made by the staff of the The tuberculosis vaccine is

a live attenuated vaccine that does not prevent infection but protects against severe forms of the disease (meningitis, miliaria) in young children (70% to 80%). [17] The degree of protection conferred by BCG (Bacillus of Calmette and Guérin) with regard to pulmonary tuberculosis in adults is limited. The average duration of protection is 10 to 15 years. In our series, all patients are vaccinated and this shows the efforts made by the staff of the health care system to implement the immunization protocol

For clinical data and time to care; Tuberculosis is a subacute pathology with an insidious onset; It evolves over several weeks or even months, which explains the delay in patient consultations. The interval between the 1st day of symptomatology and the start of treatment is 10 days to 12 months with an average of 4 months. This delay is reported by several authors. We cite as an example the series of W. Kermani where the delay was 7 months [17] and 3 months in the series of R. Bouchentouf as well as in the series of T. Habiba. [13.19].

The most common reason in our patients was cervical swelling (100%). This result is consistent with the data in the literature: the percentages ranged from 80.31% to 100%. [13.16.17.18.19]

These signs are made up of alteration of the general condition, which includes asthenia, anorexia and weight loss that can exceed 10kg, a fever of variable appearance, ranging from a vesper fever (the most frequent case) to a high, oscillating fever, accompanied by chills and night sweats. These symptoms may persist for several weeks before the patient consults. They were present in 42% of cases in our study; as well as in the Kermani series [11].

The paraclinic includes several examinations including :

The chest X-ray, which must be performed on all patients, even those suffering from extrapulmonary tuberculosis, must undergo a chest X-ray, which is still insufficient to rule out associated pulmonary tuberculosis. It may detect parenchymal or mediastinal lymph node involvement or even pleural involvement in the form of an effusion.

As for cervical ultrasound, it remains the 1st line examination in the exploration of cervical masses and the characterization of lymphadenopathy [8]. It makes it possible to confirm the diagnosis of lymphadenopathy, specify its linden, its appearance and guide the punctures. An exploration of the thyroid, parotid and submandibular glands can also be carried out at the same time. Cervical ultrasound is more sensitive than clinical examination for the study of lymph node involvement. [20]

Cervical CT scan is requested in the presence of a clinically suspicious aspect of the cavum and/or lymphadenopathy larger than three centimetres and/or fixed to the superficial and deep planes and allows the relationship with neighbouring organs as well as with the vascular axis to be studied before surgery. CT scans reflect the progression of lymph node tuberculosis from moderate lymph node hyperplasia to the onset of caseous necrosis. [6]

The cutaneous reaction to tuberculin is the expression of a phenomenon of delayed hypersensitivity to certain antigens of *M. tuberculosis*. A positive reaction in an individual indicates that he or she has been infected but does not make it possible to determine whether the infection is latent or progressive. In addition, it is not possible to determine whether the reaction is due to *M. tuberculosis* or another mycobacterium. IDR is performed by injecting 5 international units of tuberculin intradermally; on the palmar (internal) side of the forearm. The reading is taken 48 to 72 hours after the injection. It must be carried out by trained health personnel.

The reaction is the area of induration (perception of edema on palpation) around the injection site. The diameter of the induration is measured transversely using a ruler (do not measure the erythematous area around the induration, as this is not the reaction but only the indurated area).

The advent of HIV (Acquired Immunodeficiency Virus) infection has complicated the already existing tuberculosis endemic, making tuberculosis the 1st most opportunistic infection related to HIV. In Morocco, a country endemic to tuberculosis, this is particularly observed [21]. In our series, the association was weak in 2 patients, unlike the Assiya E. study where the association was reported in 39.3% of cases. [22]

For confirmation of tuberculosis recourse is had to bacteriology; The MO makes it possible to highlight BK after special preparation of the samples by Ziehl-Neelsen staining with fuschine. The BK appears in the form of a red rod. SLE remains a low contributor in PET scans, in children (difficulty in collecting samples), and in HIV patients. The sensitivity is 70% but its specificity is very low. The Fluorescence Microscope and Especially the LED Microscope; allows BK to be highlighted after auramine or Dugommier staining. It is also a less expensive method. Its sensitivity is better (84%) with a specificity of 97%. [66] Indeed, diagnosis is rarely based on bacteriological studies. This is due to the paucibacillary nature of lymph node tuberculosis linked to poor lymph node oxygenation and the importance of cell-mediated defense mechanisms at this level. Diagnosis of extrapulmo tuberculosis

It allows the diagnosis of tuberculosis with negative microscopy, in particular makes it possible to establish an extra-pulmonary tuberculosis antibiogram where the diagnosis is difficult to reach by direct examination. [22]

For molecular biology study; using PCR, which is a technique that consists of detecting and amplifying a specific nucleic sequence of the *Mycobacterium Tuberculosis* complex. The best yield for this technique is obtained on respiratory samples, on the other hand there have been many false negatives for extra-pulmonary tuberculosis; which explains why this technique is not used by our patients. [23]

As for the expert gene, this test can diagnose TB and resistance to rifampicin. Unlike other techniques (in vitro culture, antibiotic susceptibility testing and conventional molecular techniques), the Xpert MTB/RIF test can be used in peripheral laboratories and does not require sophisticated equipment or highly trained personnel to perform. The test is based on real-time PCR. It targets specific nucleic acid sequences in the *M. tuberculosis* complex genome and simultaneously provides information on the most frequent mutations related to rifampicin resistance. Due to its good performance, speed and ease of use, this test should be used as a first-line test in HIV-infected patients and when multidrug-resistant TB (MDR-TB) is suspected in both adults and children. The sensitivity of the test to detect resistance to rifampicin (RIF) compared to that of the conventional culture-based antibiogram is 97.6%. The negative predictive value of the test was high, so strains that were not resistant to rifampicin can be considered as true susceptible strains. [24] The performance of this test in the diagnosis of lymph node tuberculosis has been demonstrated by various authors. In addition, it allows for early and appropriate management of tuberculosis by allowing rapid diagnosis and early detection of cases of rifampicin resistance. [23.24.25] WHO recommended lymph node aspiration for the diagnosis of tuberculosis in endemic countries with limited resources. [26]

According to the literature, fine needle aspiration is an inexpensive, rapid and minimally invasive technique that has been proven to diagnose

tuberculous adenitis with a sensitivity equal to 88% and a specificity equal to 96%. [27.28] In our series, no patient has benefited from it.

However, it requires the presence of a trained cytologist and may delay the diagnosis of associated neoplastic pathologies (lymphoma, papillary thyroid cancer, etc.). [7]. In addition, several studies agreed on the preponderant role of cervicotomy in the diagnosis of lymph node tuberculosis, with a much greater sensitivity than that of cytology, which can reach 90 to 100% in clinically highly suspect cases. [26.27] All of these data could explain the use of cervicotomy and not needle aspiration to confirm the diagnosis in our series.

After confirmation of the diagnosis; The role of surgery in the management of cervical lymph node tuberculosis remains a subject of debate, as well as the type of surgery performed. Most authors used surgery initially for both diagnostic confirmation and treatment. In our series, all our patients were candidates for an exploratory cervicotomy, 100% of the cases.

This rate of recourse to surgery is comparable to that of the study by N. Benmansour at the University Hospital of Fez. In fact, a slightly smaller proportion described in R. Mani's series of 246 patients, 98% of whom were operated on: 47% underwent an adenectomy, 47% underwent a cellululo-lymphadenectomy and 4% a cervical abscess drainage [28]., the 326 patients collected benefited from surgery for diagnostic and/or therapeutic purposes [28.29]. A slightly smaller proportion described in the series by R. Mani made up of 246 patients, 98% of whom were operated on: 47% underwent an adenectomy, 47% underwent a cellululo-lymphadenectomy and 4% a cervical abscess drainage [28.29].

According to the literature and data in our series, supporters of the surgical therapeutic component indicate an operative procedure whenever:

- The lymph node mass is too large or calcified and it is expected that medical treatment will not be sufficient due to low diffusion of anti-tuberculosis drugs into the lymph node tissue.
- There is a cold abscess or skin fistulization, a common cause of failure of medical treatment.
- The appearance of new lymph nodes under treatment.
- Lack of response to treatment (persistence of residual lymphadenopathy despite well-conducted medical treatment).
- Enlargement of the lymph nodes after 3 months of well-conducted treatment, including late paradoxical reactions.
- Nodal recurrence after well-conducted medical treatment. [30]

Surgery for lymph node tuberculosis is delicate due to the adhesion and inflammatory phenomena that make it possible to cause certain complications such as lymphoedema, painful shoulder syndrome due to spinal nerve damage, unsightly scars, lesions of the chin branch of the facial nerve as well as other complications common to all surgery such as hematomas, infection, etc. [17]

In patients requiring TB retreatment, the empiric Grade II regimen "2S(RHZE)/1RHZE/5(RH) E" is no longer recommended, which had been replaced by "3RHZE/5(RH) E". For re-treatment cases, a test for susceptibility to anti-tuberculosis drugs should be conducted before the choice of treatment regimen. In patients requiring TB retreatment, the empiric Grade II regimen "2S(RHZE)/1RHZE/5(RH) E" is no longer recommended, which had been replaced by "3RHZE/5(RH) E". For re-

treatment cases, a test for susceptibility to anti-tuberculosis drugs should be conducted before the choice of treatment flow sheet.

Based on the drug susceptibility profile, a standard 1st line treatment regimen may be repeated, if no resistance has been documented. In the event of an early relapse occurring in less than 2 years, the "2RHZE/7RH" regimen should be prescribed.

In our series, the protocol consists of extending the duration from 6 to 9 months from the outset given the endemic situation and the high risk of resistance and recurrence. According to H. Blibech's study, which included 38 cases of lymph node tuberculosis, the duration of treatment was 6 months for 28.1% of patients, and 7 to 8 months for the others. The cure rate was better in the group treated more than 6 months (95.7% versus 77.8%).

The recidivism rate was 12.5%; All recurrence cases were in the treated group for 6 months.

The modalities of treatment compliance begin with compliance and intolerance phenomena; During treatment, the search for paradoxical reactions, adverse effects or resistance to treatment is recommended by the WHO.

However, post-treatment surveillance modalities for lymph node tuberculosis have not been recommended. A clinical consultation at the treatment centre is monthly at best [31].

If treatment is provided in another non-specialized center, it is recommended to carry out a clinical examination at least 10 to 15 days after initiation of treatment and then at 1, 2, 4 and 6 months. During these consultations, a careful assessment of the lymph node areas must be made, specifying the characteristics of the lymphadenopathy, in particular their size and their possible fistulization to the skin.

Signs of intolerance should be looked for at each consultation using questioning and a complete clinical examination of the patient. Biological examinations are not systematically repeated. They are only carried out on tared ground in the event of suggestive clinical signs.

Control the effectiveness of the treatment of lymph node tuberculosis is based, essentially, on the evaluation of the clinical evolution of tuberculous lymphadenitis; On the radiological level, cervical ultrasound seems to be the most suitable examination for the monitoring of lymph node tuberculosis. A cervical ultrasound may be offered at 2 months to ensure a favorable evolution of pre-existing lymphadenopathy. The cervical ultrasound will be repeated at the end of treatment to serve as a reference for subsequent monitoring. [32.33.34]

The absence of any sign of clinical and/or ultrasound progression is the most common criterion for healing. [31] The samples must be repeated to confirm with certainty the relapse on the basis of bacteriological and/or histological arguments and to decide whether to continue medical treatment alone or to perform a surgical procedure in addition to chemotherapy.

Hence the need for prevention of lymph node tuberculosis subject of a national plan that the Ministry of Health announced the launch of the extension of the national strategic plan for the prevention and control of tuberculosis 2021-2023, aiming to reduce the number of deaths linked to this disease by 60% in 2023 compared to 2015. The main means of prevention remain: isolation; vaccination and chemoprophylaxis or treatment of LTBI: WHO recommends integrating preventive tuberculosis treatment services into current active tuberculosis case finding initiatives. All household contacts of TB patients, as well as

people living with HIV, should be screened for active TB. If the disease is excluded, preventive treatment should be started. [33.34.35]

## Conclusion:

In the Saharan region, smoking; consumption of unpasteurized milk; HIV remain among the main risk factors, hence the interest in spreading awareness and prevention means; As for the treatment of cervical lymph node tuberculosis, it remains above all medical. However, surgery has a double interest; diagnosis and therapy. The quicker and more complete the surgical procedure, the better the results and the lower the risk of resistance or recurrence.

## References

- J.C. Yombi et al., (2015). Tuberculose: épidémiologie, aspect clinique et traitement Louvain medical. Vol.134, no.10, p. 549-559.
- Ghizlane Hamzaoui et al., (2014). Tuberculose ganglionnaire: aspects épidémiologiques, diagnostiques et thérapeutiques, à propos de 357 cas. Pan Afr Med J. 19: 157.
- Fergoug.I et al., (2014). Tuberculose ganglionnaire cervicale: à propos d'une série de 46 patients. Annales Françaises d'Oto-Rhino-Laryngologie et de Pathologie Cervico-Faciale. 131(4), A129-A130.
- Tritar-Cherif et al., (2014). Prise en charge de la tuberculose ganglionnaire. La Tunisie Médicale. Vol 92 (n°01): 111-113.
- H.Jabri et al., (2016). Les moyens diagnostiques de la tuberculose. Revue de Pneumologie Clinique. Volume 72 Pages 320-325.
- Moustarhfir Elidrissi et al., (2017). La tuberculose ganglionnaire périphérique. Revue des Maladies Respiratoires. Vol. 34 - N° S - p. A239.
- Nabil Driss. (2013). La place de la chirurgie dans la prise en charge de la tuberculose ganglionnaire. service orl; EPS Mahdia. Bull Epidemiol hebdomadaire. Vol 30 p 150-153.
- Bouchentouf, Z. Yasser et al., (2012). Le profil épidémiologique, thérapeutique et évolutif de la tuberculose ganglionnaire. J Func Vent Pulm. 9(3):1-60.
- P Hochedeza, V Zeller, C Truffot. (2003). Caractéristiques épidémiologiques, cliniques, biologiques et thérapeutiques de la tuberculose ganglionnaire observée chez des patients infectés ou non par le VIH. Pathologie Biologie 51. 496-502.
- Habiba Tebaa. (2017). La tuberculose ganglionnaire cervicale: Etude rétrospective à propos de 150 cas Marrakech. Thèse N51.
- El bied B. Afif H et al., (2007). Lymph node tuberculosis in 240 cases. Revue des Maladies Respiratoires. Vol 24 - No. HS1P. 27.
- N.Jihane. Tuberculose ganglionnaire cervicale Thèse N 016 /20 fmpf.
- Christian Lienhardt. (2011). La tuberculose dans le monde aujourd'hui: enjeux, recherche et perspectives. Santé internationale. Pages 59 à 74.
- Hicham Janah, et al., (2014). La tuberculose pulmonaire et le tabac: à propos de 100 cas. Pan Afr Med J.19:202.
- Ait Bachir h. et al., (2013). Tuberculose ganglionnaire à-propos de 101 cas. Rev Mal Respir; 30: A166.
- Michel Underner, Jean Perriot (2012). Tabac et tuberculose. La presse médicale. Vol 41 - n 12p1. p. 1171-1180.
- R. Abdelmalek. (2009). Tuberculose ganglionnaire périphérique: résultats de l'étude multicentrique. Revue des maladies respiratoires. Vol 26 - N° HS1 -P. 5-154.
- C C Leung, et al., (2003). Smoking and tuberculosis in Hong Kong. Int J Tuberc Lung Dis. 7(10) :980-986. PMID: 14552569.
- Adil Lekhbal, Kaoutar Chaker et al., (2020). Treatment of cervical lymph node tuberculosis: When surgery should be performed? A retrospective cohort studies. Ann Med Surg (Lond).55:159 163.
- Hajer Ben Brahim et al. (2014). Diagnostic and therapeutic management of lymph node tuberculosis in Tunisia. Pan Afr Med. 19:211.
- S. Mezri, M. Bahlouli F. et al., (2019). Place de la chirurgie dans la prise en charge de la tuberculose ganglionnaire cervicale. journal of functional ventilation and pulmonology. volume 10 - issue 32.
- Kampol Kanjanopas et al., (2014). Tuberculous cervical lymphadenopathy and the role of surgical treatment. Med Public Health. 5(6):1419-1424.
- Hochedez P, et al., (2003). Caractéristiques épidémiologiques, cliniques, biologiques et thérapeutiques de la tuberculose ganglionnaire observée chez des patients infectés ou non par le VIH. Path. Biol. 51:496-502.
- P. Blanc, P. Minodier et al., (2007). Les nouveaux tests diagnostiques de la tuberculose. Revue des maladies respiratoires. Vol 24 - N 4 P. 441- 452.
- Malaghini M, et al., (2011). Recombinant antigen production for assays of intradermoreaction for diagnosis and surveillance of tuberculosis. J-Biotechnology. 156:56-58.
- olebogeng X Rangaka et al., (2012). Predictive value of interferon- $\gamma$  release assays in incident active tuberculosis: a systematic review and meta- analysis. ancet Infect Dis. 12(1):45-55
- M. Berkchi Profil (2020). de la co-infection VIH et tuberculose. Revue des maladies respiratoires actualités. Vol 12 - N 1 P. 162.
- Saida Aouati, et al., (2019). Place de la cytoponction à l'aiguille fine dans le diagnostic de la tuberculose ganglionnaire. Morphologie. Volume 103 Page 74.
- T. Billard-pomares, et al., (2018). Performance de la PCR GeneXpert MTB/RIF dans le diagnostic des tuberculoses extrapulmonaires? médecine et maladies infectieuses. - Vol 48 - N 4S P. S116-S117.
- S. Fikal, et al., (2016). Apport du GeneXpert dans le diagnostic de la tuberculose. Revue des Maladies Respiratoires. 33: A142.
- Cruciani M, et al., (2004). Métaanalyse of BACTEC MGIT 960 and BACTEC 460 TB, with or without solid media, for detection of mycobacteria. J Clin Microbiol. 42:2321-2325.
- Mfinanga SG, et al., (2007). How does clinical diagnosis of mycobacterial adenitis correlate with histological findings? East Afr J Public Health.4:47-50.
- Najib Benmansour, Abdellatif Ouididi, Mohamed Noureddine El Alami. (2009). Cervical tuberculous lymphadenitis: the location of surgery. J Otolaryngol Head Neck Surg national library of medicine. 38(1):23-28.
- R Mani, M Belcadhi, et al., (2005). Mycobacterial cervical lymphadenitis: role of surgery. Rev Laryngol Otol Rhinol (Bord). 126(2):99-103.
- Dr. Pallavi Indurkar, Dr. Aashutosh Asati et al., (2017). Role of Surgical Intervention in Treatment of Tubercular Lymphadenitis in Neck Region. Annals of Medicine and Surgery. Vol. 4 No. 5. Volume 55. Pages 159-163.
- Sayaka Omura, Muneo Nakaya et al., (2016). A clinical review of 38 cases of cervical tuberculous lymphadenitis in Japan - The role of neck dissection. Auris Nasus Larynx. 43(6):672-676.
- Dautzenberg B et al., (1986). Routine use of 6-month antitubercular treatment in 300 patients. Presse Med; 15:2151-2152 [2157-2158].
- Groupe de travail du Conseil supérieur d'hygiène publique de France. Observance et suivi de traitement. Médecine et maladies infectieuses 2004. Vol 34, Num 8-9, pp 386-390.

39. La chirurgie de la tuberculose ganglionnaire cervicale dans le service d'ORL de l'hôpital militaire de Meknes à propos de 40 cas thèse numéro Année 2022 Thèse N°011/22.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article, Click Here:

[Submit Manuscript](#)

DOI:10.31579/2690-4861/475

**Ready to submit your research? Choose Auctores and benefit from:**

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://auctoresonline.org/journals/international-journal-of-clinical-case-reports-and-reviews>