Pretracheal tuberculous lymph node: an uncommon differential of a midline neck swelling

Kezevino Nagi,1 Jijitha Lakshmanan,2 Sunil Kumar Saxena2

DESCRIPTION
A girl in her teens presented to our outpatient department with swelling in the anterior neck of 1 month’s duration, which had increased in size over this period; it was not associated with pain, fever, difficulty or pain on swallowing, voice change or breathing difficulty. She did not have any history to suggest an altered thyroid profile. There was no history to suggest any previous tuberculosis (TB), contact with TB, or radiation exposure. Moreover, she had an unremarkable medical, personal and family history.

A 4 × 3 cm firm swelling in the anterior neck in the midline, which was moving with deglutition but not with protrusion of the tongue, was noted on clinical examination with no signs of inflammation (figure 1). There were no other palpable swellings in the neck or elsewhere in the body.

The patient’s blood investigations were normal, with a euthyroid profile and negative viral markers. Chest radiography was also normal. A contrast CT scan revealed multiple heterogeneously enhancing bilateral level IV and pretracheal (level VI) nodes with central necrosis, the largest measuring 2.8 × 2 cm in the pretracheal station, with multiple sub-centimetric mediastinal nodes with a normal thyroid gland and lung parenchyma (figure 2). Fine needle aspiration cytology (FNAC) showed inflammatory cells on a background of abundant caseating necrosis; no thyroid follicular cells were identified. The Zeihl–Neelson stain for acid fast bacilli was negative. However, mycobacteria growth indicator tubes (MGIT) 960 culture reported positivity for mycobacterium tuberculosis (MTB). The patient was started on anti-tubercular therapy.

The latest WHO TB statistics highlighted the burden of tuberculosis in India as an incidence of 2.64 million cases at a prevalence rate of 193 per 100 000 population.1 As per the TB India report 2020, extrapulmonary TB (EPTB) accounted for 26.6% of all notified cases of TB. Among various forms of EPTB, the two commonly encountered forms are peripheral lymph node TB, most commonly occurring in the posterior triangle, followed by TB pleural effusion.2 3 It mainly affects the young and working individuals, highlighting the socioeconomic burden of EPTB.4 Presentation of the anterior group of nodes mimics a thyroid nodule or thyroglossal cyst because of the location of the swelling and signs associated with it; hence with this initial working diagnosis, our patient was evaluated and subsequently treated for EPTB after confirmation of the diagnosis.

Head and neck TB accounts for nearly 10% of all extrapulmonary manifestations of the disease.1 The most common presentation is in the posterior triangle nodes (51%) followed by the upper deep cervical and submandibular nodes. Involvement of the anterior group of nodes is very rare, accounting for <1%.5 6 They progress through various stages, beginning with lymphadenitis, periadenitis, cold abscess, collar stud abscess, and sinus formation. Individuals mostly present in the lymphadenitis stage,2 3 commonly as a single or multiple painless swellings. The mode of spread is droplet transmission from a TB patient and then primary infection of the Waldeyer’s ring with secondary infection of the affected site. Lymph nodes of the neck can be affected by spread from the pulmonary focus via hematogenous or lymphatic routes.6 7 Consumption of infected milk is thought to be an important source of infection of the oral cavity; the presence of minute trauma of mucosa invites seeding of the bacilli.8 9

Fine needle aspiration cytology has a reported specificity of 93% and a sensitivity of 77% for the diagnosis of tubercular lymphadenitis.9 It is a simple and cost-effective investigative tool. Cyto logical criteria include the presence of lymphocytes, epithelioid cells, Langhans giant cells, neutrophils, caseous necrotic background (eosinophilic granular material without recognisable cellular elements), and haemorrhage,8 10 as was also reported in our case.11

Radiological investigation is helpful when TB of the head and neck is suspected; features may be homogeneous or a central area of low attenuation with an enhancing rim or a calcified node.12 Our patient had a CT feature of necrotic cervical lymphadenopathy of the pretracheal node.

However, a definitive diagnosis depends on finding caseating granulomas on the histopathological examination, positive staining for acid-fast bacilli, positive culture of Mycobacterium tuberculosis and a prompt therapeutic response to antitubercular drugs.13 In approximately a quarter of cases where cytology shows no evidence of TB, the culture will be positive.9 Zeihl–Neelson stain for acid-fast bacilli was negative, but MGIT 960 culture was positive for MTB in our patient.

The current global burden of drug-resistant TB has led to the need for better diagnostic options with faster and more sensitive tests. The gold standard diagnostic test for TB was culture using solid media which had a high sensitivity; however, the delayed diagnosis requiring 6–8 weeks to provide the result is a major drawback...
There is a need for fast and efficient cultivation strategies that can be easily applied in a clinical mycobacteriology laboratory. One of the most recent MGIT points in this direction, the advantages being it is easy to handle, is non-radiometric, and at present does not need costly instrumentation. A multicentre study conducted by Pfyffer et al found that MGIT has high sensitivity and faster mean time to detection, compared with other culture media. All types of specimens, pulmonary as well as extrapulmonary (except blood and urine), can be processed for primary isolation in the MGIT tube using conventional methods. The higher sensitivity and shorter detection time with the MGIT system are due to the use of an oxygen-sensitive fluorescent compound. Regarding the turnaround time, the mean detection time was significantly shorter for methods that used a liquid medium; in smear-positive specimens it was 6.41 days (Sun et al) and in smear-negative specimens 14.33 days.14

The newer diagnostic options are genotypic assays, using molecular-based rapid diagnostic tests that have reduced the turnaround time significantly and aided prompt initiation of treatment/preventive services.

The Rapid LPA (Line Probe Assay) tests for the resistance to two first-line drugs (rifampicin and isoniazid) and second-line drugs, such as fluoroquinolones, and second-line injectable drugs, referred to as a second-line LPA. They can distinguish between different species of the mycobacterium along with the resistance patterns; however, the limitations are that DNA probe technology cannot discern mixed cultures and additional probes capable of the same are to be used. In addition, LPA tests cannot be performed on smear-negative specimens; hence, such specimens need to be put on cultures and then growths could be

![Figure 1](http://casereports.bmj.com/)

**Figure 1** The swelling in the anterior neck in the midline.

![Figure 2](http://casereports.bmj.com/)

**Figure 2** Contrast CT of the neck showing homogeneous enhancing pretracheal (level VI) node with central necrosis (arrow).
PATIENT’S PERSPECTIVE

I came to the hospital with a small swelling in front of the neck; everyone told me my thyroid had grown big.

At the hospital, they checked my blood thyroid levels and told me it was normal. Then they did one test with a syringe and needle, and they took some yellowish thick fluid from it which was sent for various tests. I was so embarrassed when the results came and the doctor told me it’s TB. But I never had a cough like people say.

The doctor started me on TB drugs, and after I started them the swelling came down significantly.

Learning points

► For all neck swellings, a differential diagnosis of extrapulmonary tuberculosis should be kept in mind, unless proved otherwise.
► All midline neck swellings that move with deglutition are not from the thyroid.
► Extrapulmonary tuberculosis can present as an enlarged lymph node in the central compartment of the neck.

subjected to LPAs. This begets culture-based methods to remain the reference standards for drug susceptibility testing.\(^{15}\)\(^{16}\)

Among the cartridge-based nucleic acid amplification tests, Xpert MTB/RIF assay is fully automated and submits the result in approximately 2 hours; the limitation is its high cost which raises concerns about its affordability in low- and middle-income settings.

TrueNAT is a semi-automated in-house test giving exemplary results in diagnosing mycobacterium and resistance to rifampicin. This can be made available at the point of care nearer to patients in peripheral/rural areas, being a hand-held device that works without the need for electricity. However, it does not remove the need for conventional microscopy, culture and antitubercular drug sensitivity, that are required to monitor the progression of treatment, and for drug resistance determination to drugs other than rifampicin.\(^{14}\)\(^{15}\)

The WHO suggested culture as the highest quality level gold standard technique for the analysis of TB. It has high sensitivity over other diagnostic tests, and it can be used for phenotypic drug susceptibility testing and to provide adequate DNA rapid molecular tests for epidemiologic studies. Culture can be done over solid or liquid culture media, but as mentioned above, because of its high turnaround time, solid culture has lost its preferability.

Liquid culture media have demonstrated increased sensitivity and an expanded recovery yield of 10% in contrast to solid media. The framework methods adopted by the Revised National TB Control Programme (RNTCP) in India and endorsed through the WHO are the BACTEC 460 system, MGIT, and VersaTREK system.\(^{16}\)

MGIT uses fluorochromes, giving early growth (7–12 days) for detection and drug screening, which makes it highly useful for rapid phenotypic drug susceptibility. Apart from its high turnaround time, limitations of culture methods include low sensitivity in EPTB and paediatric TB disease, because of the paucibacillary nature of the test; also, cultures are highly prone to the growth of other microorganisms and need decontamination, which can affect the mycobacterium as well. It requires dedicated facilities and infrastructure along with skilled laboratory personnel and specialised biosafety conditions.\(^{14}\)\(^{16}\)

Finding a reproducible, efficient, cost-effective tool with minimal infrastructure requirements is an ongoing search under TB diagnostics.

The principles underlying the treatment of pulmonary TB also apply to extrapulmonary disease, including lymphadenitis. The objectives of TB therapy are to reduce rapidly the number of actively growing bacilli in the patient, to eradicate populations of persisting bacilli to achieve a durable cure (prevent relapse) after completion of therapy, and to prevent the selection of drug-resistant bacilli during therapy.\(^{17}\)

According to the recent changes in the RNTCP guidelines, the principle of TB treatment has been shifted towards a daily regimen with the administration of a daily fixed dose combination of a first-line anti-tubercular drug (ATD) as per the appropriate weight bands, with treatment in the intensive phase comprising 8 weeks of isoniazid, rifampicin, pyrazinamide and ethambutol in daily doses as per four weight band categories, with pyrazinamide stopped in the continuation phase, and the other three drugs continued for another 16 weeks as daily doses.

In the management of EPTB, the change implemented in the continuation phase in both new and previously treated cases may be extended to 3–6 months in certain types of TB such as central nervous system, skeletal, and disseminated TB. After completion of treatment, the patient should be followed up at the end of 6, 12, 18 and 24 months; in comparison there was no provision for long-term follow-up in the previous guidelines.\(^{18}\)\(^{19}\)

The definition of presumptive drug-resistant TB (DRTB) includes TB patients who have failed treatment with first-line ATDs, TB patients who are contacts of DRTB, TB patients who are found to be positive on any follow-up sputum smear examination during treatment with a first-line ATD, previously treated TB cases, and TB patients with HIV co-infection.

Bedaquiline belongs to a new class of drug, the diarylquinolines, and has been introduced as a new ATD under the RNTCP. It has the advantage of exhibiting no cross-resistance with first and second line ATDs, and also shows a significant benefit in improving the time to culture conversion in multiple drug-resistant TB patients.\(^{19}\)

Within 2 months of initiation of ATD therapy, there was a gradual reduction in the size of the swelling. The patient has been on regular follow-up to date.

Contributors KN: acquisition of data and drafting the manuscript. JL: revising the manuscript for critically important intellectual content. SK: final approval of the version published.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Consent obtained from parent(s)/guardian(s)

Provenance and peer review Not commissioned; externally peer reviewed.

Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

ORCID iD

Kezervino Nagi http://orcid.org/0000-0001-5261-3798

REFERENCES

Images in...


