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Double pathology in cases of cold abscess neck: A case report

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ABSTRACT

In 2022, a 20-year-old male patient came to our OPD with a complaint of slight neck pain and swelling in the anterior side of his neck for two months. On observation, the swelling was present in the anterior aspect of the neck in the midline above the suprasternal notch. USG in the neck shows a heterogeneous lesion with moving echogenic debris in the anterior aspect of the neck MRI showed a well defined T1 isointense T2 hypointense peripherally enhancing lesion showing no diffusion restriction/blooming in the right cerebellum. While CBNAAT detected the presence of mycobacterium tuberculosis, high dose contrast enhanced computed tomography shows ill defined hypointense peripheral enhancing collection in the right anterior aspect of the neck with multiple peripherals enhancing necrotic lymph nodes. Tissue culture shows no growth. The pathology report revealed the presence of persistent necrotizing granulomatous inflammation with tuberculosis neck with MRI brain showing cerebral tuberculoma. A thorough assessment and prompt treatment are necessary to avoid a fatal prognosis because cerebral tuberculoma might manifest with very minimal neurological symptoms while having massive lesions.

Keywords: Tuberculosis, Cerebellar tuberculoma, Antituberculosis therapy

1. INTRODUCTION

A quarter of the annual tuberculosis incidence worldwide is found in India, the second most populous country in the world (TB). Over 2million individuals in India are afflicted with TB each year. First line drugs resistant tuberculosis has become more prevalent in India, posing major public health concerns. Each year, India reports (Kumar et al., 2018) Nine million new cases of tuberculosis (TB), of which 0.8 million are "infectious-positive TB cases." World Health Organization (WHO), tuberculosis (TB) accounts for around 28 fatalities per 100,000 persons in India, making it the most prevalent infectious disease and the primary cause of 26% of all adult deaths that could have been prevented (Kruijshaar et al., 2011). The bacteria that cause brain TB spreads widely and is primarily found in the body. One example of multiple lesions among five patients was found in a study conducted in Chile, which also found 33 incidences of multiple tuberculomas out of 97 confirmed cases. Brain tuberculosis or meningitis brought on by the condition is characterized by moderate fever, headache and vomiting. The neck ROM will be reduced and a headache appear as the condition worsens. Children may have convulsions, body part weakness and eventually, impaired awareness. The diagnosis is

made using a comparable ring enhancing lesion on computed tomography (CT) scan and magnetic resonance imaging (MRI) examinations. For brain tuberculoma, the course of treatment is mostly medical and can last anywhere between six and 36 months. Surgery is advised in some circumstances (Saleh et al., 2014).

2. CASE PRESENTATION

In 2022, A 20-year-old male patient who had slight neck pain and swelling in the anterior side of his neck for two months and had no known tuberculosis contacts or family members presented to our hospital. There were no signs of TB in his family. There was no pre-existing fever or evening temperature rise. But he intermittently answered queries and followed instructions. When examined by a physician, he could respond. He was aware of time, place and people. A 3*3 cm bulge was discovered during an examination in the midline of the anterior neck (Figure 1), above the suprasternal notch. On palpation, it was firm in consistency and there was warmth or tenderness. Cranial nerves, sensory and motor systems were normal. Laboratory and physical examinations such as ultra sound neck, neck Computerized Tomography (CT) Scan and brain Magnetic Resonance Imaging (MRI) clinical findings including microbiological and histopathological examinations were applied.

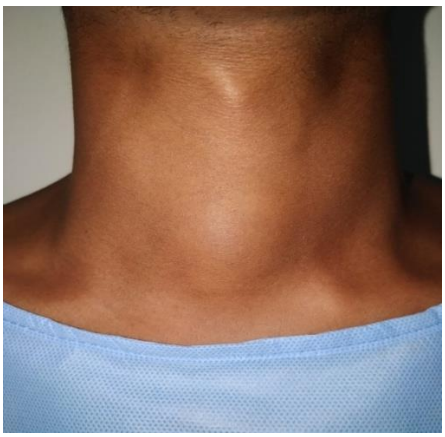

Figure 1 Appearance of swelling at the anterior aspect of the neck

An ultrasound of the neck revealed a well defined, heterogeneous lesion with moving echogenic material that was anterior to the thyroid gland and measured around 8.5*4 centimetres. These findings are likely indicative of an abscess. Both thyroid lobes seemed normal with good vascularity and had typical homogeneous echotexture, with the isthmus seeming to be in normal condition. The parotid and submandibular glands on either side were normal. The jugular and carotid arteries on either side were normal. Bilateral levels 2, 5 and left level 4 all had a few necrotic lymph nodes, with the right level 2 target being around 9*6 mm.

Following the injection of IV contrast, CECT (high dose contrast enhanced computed tomography) was performed to examine the helical plain study of the neck. The right anterior neck's infra thyroid area, which crosses behind the right sternocleidomastoid muscle and extends up to the right supraclavicular region, showed an ill defined hypodense peripheral enhancing collection that measured 7.4 * 7.8 * 3 cm. In the left supraclavicular and visible area of the left pre and paratracheal region, measuring 1.6*1.4cm, there are several peripherals augmenting necrotic lymph nodes. There were no apparent mass lesions in the laryngopharynx, oro, or nasal regions, all of which seemed normal. The rest of the soft tissues under the skin, including the tissue fat planes, seemed healthy. The valleculae, pyriform sinuses, true and false cords, laryngeal ventricles, hyoid bone, thyroid, arytenoids and cricoid cartilages, as well as the epiglottis, all seemed to be in good condition. The jugular and carotid vessels looked healthy. Ring enhancing lesion of 9*8 mm was detected in the right cerebellar hemisphere during CECT neck testing. The whole diagnosis is required, including clinical connection.

In the right cerebellum of the brain, an MRI with contrast revealed a well defined T1 isointense T2 hypotensive peripherally enhancing lesion that showed no diffusion limitation or blooming and measured 0.9*0.9 cm. Very little surrounding edema was visible. No discernible meningeal enlargement was present. The sulcal and Gyral pattern seemed normal and grey and white matter distinction was preserved. The brain stem, ventricles, cisterns and basal ganglia all showed no abnormalities. No midline shift occurred. The superior sagittal sinus, basilar artery and intracranial sections of the ICA internal carotid artery continue to flow normally. Left maxillary sinuses show thickening of the polypoidal mucosa. There is a bilateral increase in inferior turbinate size MRI Brain with contrast showing T2 hypodense peripherally enhancing lesion in the right cerebellum of 0.9*0.9cm size. Features likely tuberculoma

Figure 2 MRI brain with contrast

Rifampicin resistance mycobacterium by the cartridge based nucleic acid amplification test (CBNAAT) seems positive. We collected pus samples from the subject for the CBNAAT examination (Sachdeva and Shrivastava, 2018; Worley et al., 2014) (Figure 3). The sample was covered with the sampling reagent, which has a 2:1 ratio of NaOH and isopropanol and was then left at room temperature with episodicvibration for 15 minutes in accord with the standard operating procedure. The treated substance was then dispensed into a cartridge and put into the module of the CBNAAT device. After 1 hour and 50 minutes, we monitored the result from Gene Xpert. The remaining assay phases were completed immediately. After the samples had been dilated, they were loaded into the cartridge for automated analysis. The automated analysis yielded results in 100 minutes. Rifampicin resistance tests and mycobacterial detection were done simultaneously. Mycobacterium tuberculosis was found using a cartridge based nucleic acid amplification assay the specimenis taken from the anterio aspect of the neck cystwalland lymph node for histopathological examination HPE.

The report shows the necrotizing granuloma with Langham's type of giant cell under microscopic examination. Those impressions showed the features of necrotizing granulomatous inflammation consistent with tuberculosis. In microbiological examination, the tissueculture and sensitivity test showed the absence of puscells in gram stain and no organisms were visualized in the direct smear. The result showed no growth in culture.

Figure 3 Incision at the swollen area for sample collection

Treatment option

Antitubercular medications: Streptomycin (STM), rifampicin (RMP), isoniazid (INH), pyrazinamide (PZA) and ethambutol (EMB) are approved to treat tuberculosis (Padda and Reddy, 2021). Antibiotics were provided, including omeprazole (20 mg), ciprofloxacin (500-750 ng), ethambutol (800 ng) and isoniazid (300 ng).

3. DISCUSSION

Acid Fast Bacilli is aerobic, non-motile, and non-spore-forming, M. tuberculosis infects more than 2 billion individuals globally, primarily this bacillus affects the lungs which can also spread to the lymph nodes, skin and meninges. One of the most severe human mycobacterial diseases is brain tuberculoma. Children and immune compromised people, particularly those with HIV infection are typically affected. Malnutrition, neoplasms and the use of immune suppressive drugs are other risk factors (Delance et al., 2013; Thakur et al., 2018; Zunt, 2018). HIV testing came out negative, there were no risk factors for TB and there was no evidence of pulmonary TB in our patient.

Tuberculomas can develop in the epidural, subdural, subarachnoid or spinal cord spaces. In adults, they are usually supratentorial (frontal and parietal). Depending on where the lesion is, the clinical manifestation may include headache, seizures or a localized neurological impairment (Bayindir et al., 2006; Kelly et al., 2011). There is a right cerebellar lesion in our patient, but no neurological symptoms are present. The following table compares the clinical and neuroimaging characteristics of patients with cerebral tuberculoma who have neurological symptoms or non-neurological symptoms and extensive MRI lesions (Table 1).

Table 1 Clinical and Neuroimaging Features of Patients with Cerebral Tuberculoma with or without Neurological Symptoms and Extensive MRI Lesions

	Our case	Saitoh et al., 2022	Maryam Saleh et al., 2014	Harada et al., 2008
Age / sex	20 / man	59 / woman	15/girl	32/woman
Initial complaints	Swelling in the anterior aspect of the neck for 2 months and experienced mild neck pain	Mild back neck pain for 3 months	Altered attention, fatigue, and abnormalities in the motor performance and sensation of the left-side extremities are also observed.	Headache, widespread weakness, sleepiness, dizziness, double vision,
Physical assessment	There was no history of fever or evening rise in temperature. He was oriented the swelling of 3*3 cm was present in the anterior view of the neck in the midline above the suprasternal notch. On palpation, it was firm in consistency and there was warmth or tenderness	She had no fever, cough, or chills. Her general physical Examination findings were normal. Neither muscle weakness nor hyperreflexia was noted and the plantar response was flexor. Her cognition was normal	She frequently answered queries and followed instructions. She could respond well to medical questioning, In terms of time, place and people, she was oriented. An issue with the neck and left side paresthesia were identified. Sensory and motor systems as well as cranial nerves were all normal.	Impaired gait, and slurred speech
HPE	Neck cyst specimen impressions showed the features of necrotizing granulomatous inflammation consistent with tuberculosis.	Brain tissue shows Multiple granulomas consisting of multinucleated giant cells and lymphocytes accompanied by caseous necrosis	Histological analysis revealed that the lungs did not present any major objective.	None
MRI lesion	MRI showed a well-defined	Extensive T2/FLAIR	In the left cerebellar	Tuberculomas in right

	T1 isointense T2 hypointense peripherally enhancing lesion blooming in the right cerebellum.	hyperintense lesions mainly involving the deep to the subcortical white matter of the right parietal lobe with patchy gadolinium enhancement	hemisphere and right frontoparietal to temporal area, there were several T1 low signal masses that showed presence of hemorrhage with surrounding edema.	gangliocapsular, thalamus and periventricular regions with significant mass effect
Microbiological examination	Tissue culture result showed no growth.	Positive PCR findings of the biopsied brain tissues and on QuantiFERON®-TB (interferon-gamma release assay)	Also performed a direct microscopic examination of a biopsy specimen. The test results weren't publicised.	Positive by cerebrospinal fluid study (details unknown)
Treatment options	Ciprofloxacin (500-750 mg), ethambutol (800 mg), isoniazid, and omeprazole (20 mg) (300 mg).	Streptomycin, isoniazid, and rifampicin	Ciprofloxacin, ethambutol, isoniazid, and omeprazole (20 mg), and the patient underwent brain surgery.	Isoniazid, rifampicin, pyrazinamide, ethambutol with dexamethasone followed by cranial surgery (ventriculoperitoneal shunting)

The diagnosis of tuberculoma can be verified using one of two techniques. The first technique, which is microbiological, entails proving M. Tuberculosis's existence in a culture or by PCR. The second approach, for the detection of mycobacterium tuberculosis, will be histological. The Erlich Ziehl-Nielsen stain can cause a histochemical response in M tuberculosis. It takes 104 mycobacterium bacilli per milliliter to make a diagnosis using this approach, which has a sensitivity range of 0% to 44% for identifying this infection (Delance et al., 2013; Ulrichs et al., 2005). In our case, histological findings report show the necrotizing granuloma with Langham's type of giant cell under microscopic examination after the procedure. Those impressions showed the features of necrotizing granulomatous inflammation consistent with tuberculosis. Microbiological investigations were used to make the tuberculoma diagnosis that concludes with no growth in culture.

First line antitubercular drugs are suggested for the management of Mycobacterium TB disease, including RMP, INH, PZA and EMB. An interprofessional team of healthcare workers must provide vital care for individuals with TB since the infectious disease is avoidable and can result in drug resistance and fatality a primary care physician, an expert in infectious diseases, a care giver and a druggist is among these medical personnel. Patients should be informed about the dangers of not following medication instructions that might eventually lead to Multi Drug Resistant TB and cause death by the doctors and other medical professionals. We provided ATT drugs including omeprazole (20 mg), ciprofloxacin (500-750 ng), ethambutol (800 ng) and isoniazid (300 ng).

4. CONCLUSION

It is highly uncommon for cerebellar tuberculomas and neck TB to occur. There have only been a few cases published in the literature up to this point, the majority of which included adult patients who had clinical symptoms that suggested CNS involvement. Inversely, our patient only had a clinical manifestation of tuberculosis in the neck, with no other clinical symptoms suggesting brain involvement. This was only incidentally discovered during his CECT, which was done to look at the neck's helical plain study. As a result, the doctor asked to perform additional extrapulmonary manifestations to rule out the possibility of brain involvement. To conclude, even cold abscess cases can have hidden manifestations of tuberculosis with no signs/symptoms.

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Author's contribution

Rajasekar: Data collection, preparation of the manuscript, correction of the manuscript; Sarenya KS: Preparation of manuscript and data collection.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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