

A case of Cervical Cold Abscess Refractory to Empirical Anti-Tubercular Therapy due to *Mycobacterium Fortuitum*: Awareness on Non-Tuberculous Mycobacteria (NTM) Infection!

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Abstract

A third-year medical student, 19 years, had multiple cold abscess at left posterior triangle with systemic symptoms-poor appetite and weight loss. Histopathology was consistent with tuberculous lymphadenopathy as it showed Langham's giant cells and caseation necrosis. Both systemic symptoms and local lesions were refractory to empirical treatment for tuberculosis standard anti-tubercular therapy: isoniazid, rifampicin, ethambutol and pyrazinamide. Pus for Gene Xpart was negative. Pus culture showed non-tuberculous mycobacteria (NTM); *Mycobacterium fortuitum*.

Key words: cold abscess; tuberculous lymphadenopathy; non-tuberculous mycobacteria (NTM); mycobacterium fortuitum;

Background

The aetiology of cold abscess is mainly due to tuberculosis i.e. *Mycobacterium tuberculosis*; therefore, it resolves with standard anti-tubercular therapy. However, it may be rarely due to NTM infection.

Infections caused by NTM are increasing particularly in developing countries; and, NTM causes severe respiratory, skin and mucosal infections in humans. They are difficult to treat as it has intrinsic resistance to many common antibiotics (Johansen et al., 2020). NTM includes all *Mycobacterium* infection except *Mycobacterium tuberculosis*; they are *Mycobacterium fortuitum*, *Mycobacterium abscessus*, *Mycobacterium intracellulare*, *Mycobacterium avium* and *Mycobacterium simiae*.

Mycobacterium fortuitum is a rapidly growing mycobacteria, generally of low virulence; however, it is capable of causing a wide spectrum of infections (De Groote & Huitt, 2006). It causes skin and soft-tissue infection producing slowly progressive granulomatous disease.

Pulmonary disease and disseminated infection are relatively uncommon (Gebo et al., 2002) though there were case reports; "*Mycobacterium fortuitum* infection in previously healthy lung" (Park et al., 2008) and those with underlying cystic fibrosis (Johansen & Kremer, n.d.). Moreover, it rarely caused peritonitis in patients on chronic peritoneal dialysis (Hamade et al., 2014), acute central nervous system infection in patient with ventriculoperitoneal shunt (Xess et al., 2019), choroidal granuloma (da Silva Neto et al., 2019), disseminated folliculitis (Macente et al., 2013) and retroperitoneal cold abscess (Nguyen et al., 2009).

Case Presentation

A 19-year-old girl, third year medical student had COVID-19 infection in third wave; she had fever and cough for one week. She recovered with symptomatic treatment; she was back to normal for one month. Later on, she had poor appetite for 3 months and also noticed weight loss 9 pounds (95 lb to 86 lb) over that period. Then, she noticed painful swelling in left side of neck with fever [1].



Figure: (1) Self photo showing swelling at left neck

There was no dental problem or swallowing problem. There was no organomegaly or other lymphadenopathy. She had BCG vaccination; there was no history of tuberculosis before.

Blood for complete picture was normal apart from mild anemia (Hb 10.9

gm%, Total WBC $7.3 \times 10^9/L$, N 57%, L34 %, M7%; platelet count $339 \times 10^9/L$, ESR 35 mm/1st hr. Chest radiograph revealed calcification in hilar area compatible with old healed primary complex; no parenchymal lesion [2].



Figure: (2) CXR revealed hilar calcification suggestive of old healed primary complex

On examination, 4 cm tender left cervical lymphadenopathy at posterior triangle with features of abscess was noted. Lymph nodes in other areas were not palpable. Tonsils were normal. ENT surgeon did incisional

biopsy; brownish pus 3 cc was drained. The culture was sterile. The histopathological sample showed giant cells with caseous necrosis. Figure [3, 4, 5]

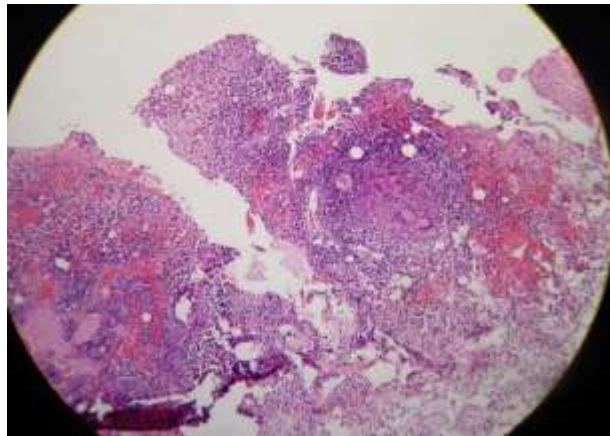


Figure: (3) Low power view showing multiple area of caseation necrosis in the cervical lymph node biopsy

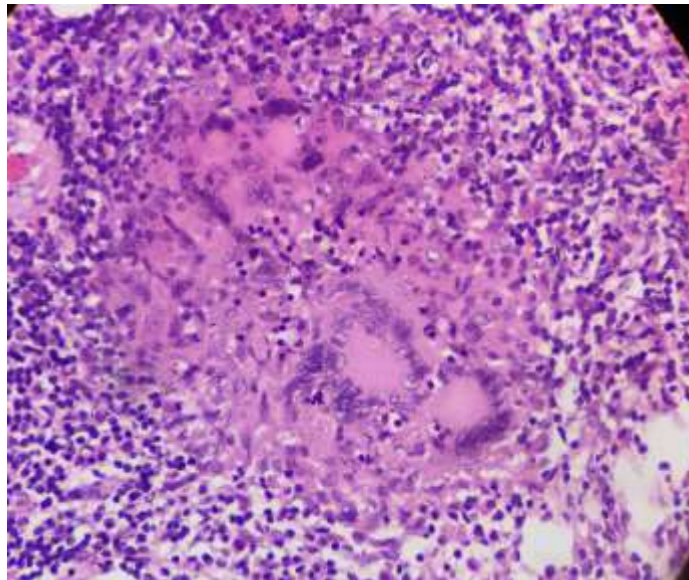


Figure: (4) Low power view showing multiple area of caseation necrosis with Langhan's giant cells in the cervical lymph node biopsy

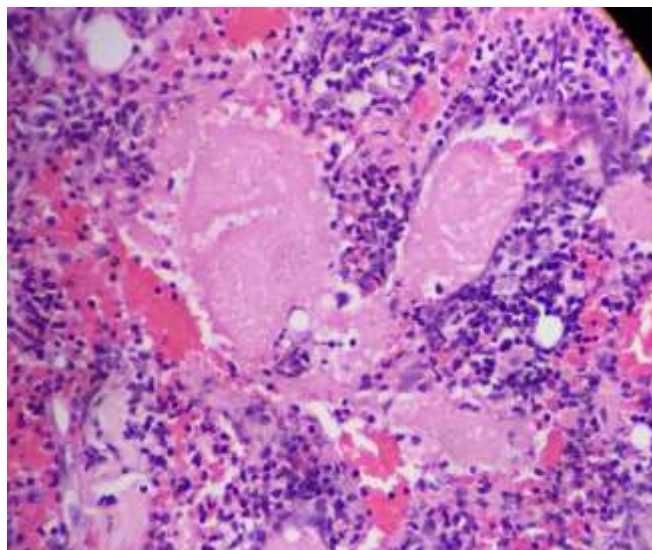


Figure: (5) Large area of caseation necrosis

Therefore, she was treated as a case of tuberculous cervical lymphadenopathy with isoniazid, rifampicin, ethambutol and pyrazinamide. Her appetite was still poor; moreover, she still had intermittent fever.

Three months later, there was another swelling below previous lesion; and, it was painful. Apart from cold abscess, no new physical finding was noted. Figure [6] As it had features of abscess, incision and drainage was done. Pus for culture was sterile.



Figure: (9) recurrence of abscess in upper old scar with healed lower scar after 4 months anti-tubercular therapy

Anti-tubercular therapy was continued while waiting for culture results of Mycobacterium tuberculosis. Figure [7] & Figure [8] showed progress. She had poor appetite and felt unwell.



Figure: (6) old incision scar with 2 abscesses below after 2 months anti-tubercular therapy



Figure: (7) old incision scar with 2 abscesses below after incision and drainage after 2 months anti-tubercular therapy



Figure: (8) *old incision scar with healing lower one after 3 months anti-tubercular therapy*

After 4 months of anti-tubercular therapy, a small abscess with underlying 1 cm indurated area was noted over the old healed scar. Figure [9].

After several negative cultures of the material drained from the abscesses, finally one of the cultures isolated the agent *Mycobacterium*

fortuitum. Therefore, anti-tubercular therapy was discontinued; clarithromycin and ciprofloxacin were initiated. Three days later, she had good appetite and felt better. The small abscess over old upper scar resolved over one month. Figure [10].



Figure: (10) *Improvement two weeks after treatment for non-mycobacterium tuberculosis*

Discussion

First, the patient had poor appetite following COVID-19 infection; she recovered completely within few weeks. One month later, she lost her appetite with significant weight loss for 3 months. Then, she noticed painful swelling in neck. The scenario should not be confused with long COVID syndrome as the patient had complete recovery period for one month. It highlighted the importance of history taking.

The patient had unilateral cervical lymphadenopathy with cold abscess. Typical tuberculous cervical lymphadenopathy is usually bilateral; and, unilateral involvement is not common. It is one of the reasons for presenting this case.

The diagnosis of tuberculous cold abscess was confirmed with histopathological examination; therefore, empirical anti-tubercular

therapy was prescribed. However, the patient's appetite was still not good with ongoing weight loss with definitive treatment; empirical anti-tubercular therapy. The important differential diagnosis to be considered at this point were drug resistant *Mycobacterium tuberculosis*, non-mycobacterial (NTM) infection like *Mycobacterium fortuitum*, nocardiosis and actinomycosis; they could be differentiated by special culture and sensitivity. Drug resistant *Mycobacterium tuberculosis* is common in pulmonary tuberculosis; not with cold abscess. In actinomycosis, typical yellowish sulfur granules can be seen in discharge. Bacterial cultures and pathology are the cornerstone of diagnosis.

Moreover, untoward effects of anti-tubercular drugs causing poor appetite could not be ignored in this case. If poor appetite was due to drug side effect, the local abscess should be responsive. Having both local lesion unresponsiveness and persistence of poor appetite gave a clue to different aetiology/causal organism in this case.

Side effects of standard anti-tubercular therapy are common. Are the patient suffering side effects of drugs? Isoniazid, rifampicin and pyrazinamide commonly cause hepatotoxicity; jaundice, nausea and raised liver parenchyma enzymes are clue to drug induced hepatitis. In this case, liver function tests were normal; therefore, the appetite problem could not be explained with side effects of drugs.

Mycobacterium fortuitum is notorious for anti-microbial resistance. The case presented with unilateral lesion with marked systemic features; and, systemic features as well as local lesion improved with clarithromycin and ciprofloxacin which are sensitive for *Mycobacterium fortuitum*.

Conclusion

Both histopathological and special microbiological services are essential for NTM infections. High index of clinical suspicion for NTM is important if cold abscess is not responding to standard anti-tubercular therapy. *Mycobacterium fortuitum* is often regarded as one of the most antibiotic-resistant mycobacteria, leaving us with few therapeutic options. With an increasing prevalence of NTM worldwide, all clinicians should recognize and treat NTM infections.

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The authors declared no potential conflicts of interests with respect to authorship and publication of this article.

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Our institution does not require ethical approval for reporting cases.

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Informed consent

The informed consent for publication in this article was obtained from patient.

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