World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

The diagnostic trap of necrotic granulomas where cat-scratch disease mimics tuberculous lymphadenitis in an adolescent

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World Journal of Advanced Research and Reviews, 2026, 30(01), 2016-2018

Publication history: Received on 10 March 2026; revised on 18 April 2026; accepted on 20 April 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.30.1.1028

Abstract

Background: Cat-scratch disease (CSD) and tuberculous lymphadenitis are the primary causes of chronic granulomatous lymphadenopathy. Distinguishing between them is challenging when necrosis is present on histopathology.

Case Report: A 15-year-old girl presented with cervical lymphadenopathy and constitutional symptoms. Despite initial suspicion of tuberculosis due to necrotic granulomas, tests including QuantiFERON-TB Gold, GeneXpert, and cultures were negative. The diagnosis of CSD was confirmed by positive Bartonella henselae serology and the recent acquisition of a kitten.

Conclusion: CSD can histologically and clinically mimic tuberculous lymphadenitis. A thorough environmental history and serology are essential to avoid diagnostic errors in endemic regions.

Keywords: Necrotic granuloma; Cat-scratch disease Bartonella henselae; Tuberculous lymphadenitis; Differential diagnosis; Cervical lymphadenopathy

1. Introduction

In regions where tuberculosis (TB) is endemic, the discovery of a necrotic granuloma in a lymph node biopsy almost systematically leads to a diagnosis of TB. However, Cat-scratch disease (CSD), caused by Bartonella henselae, can also produce necrotizing granulomatous inflammation. While CSD typically features 'stellate' necrosis, it can occasionally be mistaken for caseous necrosis, leading to diagnostic confusion, especially when the patient presents with systemic symptoms like weight loss and fatigue.

2. Case report

A 15-year-old girl with no significant medical history was admitted for a painful right cervical mass evolving for four weeks. The patient reported constitutional symptoms, including marked asthenia, anorexia, and a weight loss of 3 kg over the last month. Physical examination revealed a 3.5 cm, firm, and slightly tender right jugulodigastric lymphadenopathy (figure 1). A meticulous skin exam showed no visible inoculation site. Cervical ultrasound demonstrated a 38x22 mm hypoechoic, heterogenous lymph node with increased peripheral vascularization, suggesting suppurative lymphadenitis. The chest X-ray was strictly normal.

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Biological workup showed a white blood cell count of 11,200/mm^3 and an elevated C-reactive protein (CRP) at 32 mg/L. Infectious investigations, including the QuantiFERON-TB Gold test, GeneXpert MTB/RIF, and BK cultures on the biopsy fragment, were all negative. Significantly, detailed re-interrogation revealed that the family had acquired a young kitten six weeks prior to the onset of symptoms. An excisional biopsy revealed granulomatous lymphadenitis with epithelioid and giant cell granulomas and central necrosis(figure 2). Serology for Bartonella henselae was strongly positive, establishing the diagnosis of necrotic CSD.

Management and Outcome: The patient was started on a five-day course of **azithromycin** (500 mg on day 1, followed by 250 mg daily for four days). The clinical response was prompt: she became afebrile within 48 hours. The constitutional symptoms resolved within two weeks, and a follow-up examination at one month confirmed the complete disappearance of the cervical lymphadenopathy.

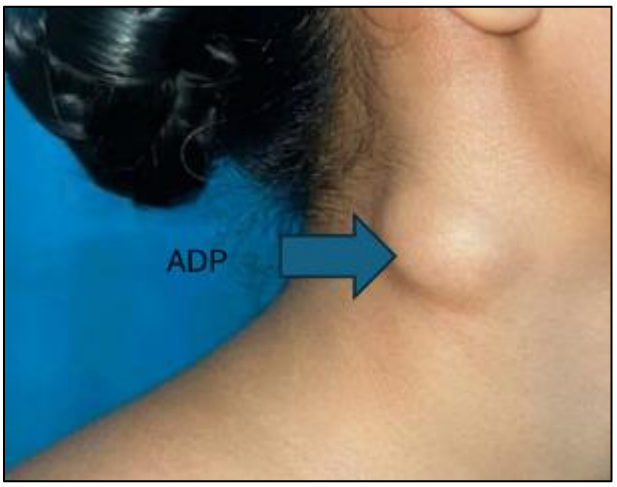

Figure 1 Clinical presentation of cervical lymphadenopathy

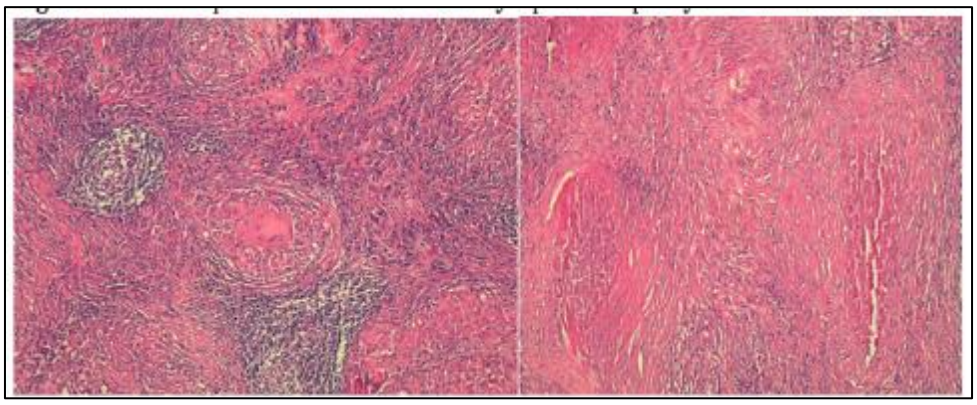

Figure 2 Microscopic features of the lymphadenopathy. Granulomatous reaction featuring epithelioid cells, Langhans-type giant cells, and areas of necrosis

3. Discussion

The diagnosis of chronic cervical lymphadenopathy in adolescents presents a significant clinical challenge, particularly in regions where TB remains a major public health concern [1, 2]. While localized swelling is common, systemic symptoms like weight loss shift suspicion toward mycobacterial infections or malignancy [4, 5]. The most critical diagnostic pitfall in this case was the histopathological presence of necrosis. In endemic areas, a necrotic granuloma is often considered pathognomonic for tuberculous lymphadenitis [2, 7]. Classically, TB features "caseous" necrosis, whereas CSD features "stellate" necrosis with a neutrophilic infiltrate [3, 10]. However, in advanced CSD, necrosis can become extensive and confluent, mimicking caseosis [2, 6]. This histological overlap frequently leads to unnecessary long-term anti-tuberculosis therapy [6, 7]. The systematic use of modern diagnostic tools was vital. The triple negativity of GeneXpert, mycobacterial cultures, and IGRA (QuantiFERON) provided the clinical confidence to withhold TB treatment and pursue serological testing [2, 8]. Therapeutic Strategy: Azithromycin was selected as the treatment of

choice to reduce lymph node volume and prevent suppuration [1, 9]. While CSD can be self-limiting, antibiotic intervention in necrotic or systemic forms accelerates recovery and prevents further complications. The rapid clinical success in this case justifies the use of targeted macrolides once TB is excluded [4, 9]. Finally, the environmental history was the defining feature. Up to 25% of systemic CSD cases occur without a visible inoculation site [1, 4]. The recent acquisition of a kitten emerged as the most significant clinical clue [5, 9]. This reinforces the "One Health" approach, where detailed questioning about household pets can bypass invasive investigations [2, 10].

4. Conclusion

This case highlights the importance of a 'One Health' approach, where environmental history directs the diagnostic process. CSD must be considered a primary differential diagnosis for necrotic granulomatous lymphadenitis in adolescents, even when the necrosis appears caseous. Systemic Bartonella serology is essential when tuberculosis tests remain negative, allowing for effective treatment with azithromycin and ensuring a complete clinical recovery

Compliance with ethical standards

Disclosure of conflict of interest

The author declares no conflict of interest

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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