

Paradoxical Reaction To Antituberculous Therapy In A Child With Cervical Tuberculous Lymphadenitis: A Moroccan Case Report

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Abstract:

Introduction:

Cervical tuberculous lymphadenitis is the most frequent extrapulmonary form of tuberculosis (TB) in children. Immune-mediated “paradoxical reactions” during antituberculous therapy may mimic treatment failure or drug resistance.

Patient and setting:

An 8-year-old BCG-vaccinated girl, otherwise healthy, presented with a six-month history of a painless left latero-cervical swelling.

Initial clinical findings:

Physical examination revealed a firm, mobile, 2-cm left cervical lymph node, with no systemic or respiratory symptoms.

Diagnostic assessment:

Cervical ultrasound revealed multiple necrotic lymph nodes. An exploratory cervicotomy with excisional biopsy was performed. Histopathology showed caseating epithelioid and giant-cell granulomas. GeneXpert MTB/RIF detected *Mycobacterium tuberculosis* with no rifampicin resistance. The diagnosis of cervical tuberculous lymphadenitis was confirmed.

Timeline:

Day 0: diagnosis established, standard anti-TB regimen initiated (2RHZE/4RH).

Week 8: reappearance of multiple left cervical lymph nodes and a 4 × 2 cm cutaneous fistula, consistent with a paradoxical reaction.

Intervention:

Surgical drainage of the fistula was performed under general anesthesia, sparing the deep lymph nodes. A short course of corticosteroids (prednisone 1 mg/kg/day for four weeks) was added, while maintaining the same anti-TB regimen.

Outcomes:

Rapid clinical improvement was observed, with progressive closure of the fistula, normalization of inflammatory markers, and no relapse after 12 months of follow-up.

Conclusion:

Early recognition of paradoxical reactions prevents unnecessary treatment modifications. A conservative multidisciplinary approach combining continuous anti-TB therapy, limited surgical drainage, and short-course corticosteroids ensures favorable outcomes.

Keywords: Lymph node tuberculosis; Child; Paradoxical reaction; Cervical polyadenopathy; Fistulization; Corticosteroids.

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I. Introduction:

Tuberculosis (TB) remains a major global public health problem, with over 10 million new cases each year. In children, extrapulmonary TB accounts for 15–20% of all cases, with lymph node involvement being the most common presentation. Despite the high efficacy of anti-TB chemotherapy, paradoxical reactions may

occur, reflecting an exaggerated immune response to bacillary destruction. These reactions can be confusing and may mimic therapeutic failure or drug resistance, leading to unnecessary changes in treatment.

Patient Information:

An 8-year-old girl, with no significant past medical history and vaccinated with BCG, presented with a painless, non-inflammatory swelling in the left side of the neck evolving for six months. Physical examination revealed a firm, mobile 2-cm latero-cervical mass without signs of superinfection or associated respiratory symptoms.

Diagnostic Assessment:

Cervical ultrasound demonstrated multiple necrotic lymph nodes on the left side. An exploratory cervicotomy with excisional biopsy was performed. Histological analysis showed epithelioid and giant-cell granulomas with central caseous necrosis, confirming tuberculous lymphadenitis. GeneXpert MTB/RIF was positive for *Mycobacterium tuberculosis* with no rifampicin resistance. The diagnosis of cervical tuberculous lymphadenitis was retained.

Therapeutic Intervention and Clinical Course:

A standard anti-TB regimen recommended by the World Health Organization (2 months RHZE followed by 4 months RH) was initiated. After two months, the patient developed new left cervical lymphadenopathies and a 4 × 2 cm cutaneous fistula, suggesting a paradoxical inflammatory reaction. Surgical drainage of the superficial abscess was performed under general anesthesia, without manipulating the deep nodes. A short course of oral corticosteroids (prednisone 1 mg/kg/day for four weeks) was prescribed while maintaining the same anti-TB regimen. The patient improved rapidly, with complete healing and no recurrence after one year of follow-up.

II. Discussion:

Tuberculosis remains a major public health concern, especially in high-burden countries. According to the 2024 WHO Global Tuberculosis Report, more than 1.3 million children develop TB each year, with extrapulmonary forms representing about 20% of pediatric cases. Among these, cervical tuberculous lymphadenitis is the most frequent extrapulmonary manifestation, accounting for up to 45% of cases in children. It often develops following lymphatic spread from a primary, sometimes latent, pulmonary focus and typically presents as a chronic, painless swelling that may progress to suppuration and fistulization.

Paradoxical reactions are well-documented but often underrecognized complications of anti-TB therapy. They are defined as the clinical or radiological worsening of pre-existing lesions, or the appearance of new lesions in patients initially responding to treatment, in the absence of drug resistance or poor adherence. These reactions are immunologically mediated and usually occur between the 4th and 12th week of therapy. Reported incidence ranges from 6% to 25% in adults and approximately 8–10% in HIV-negative children. The underlying mechanism involves hyperactivation of the Th1 immune response, triggered by the release of mycobacterial antigens following bacillary death. This results in excessive secretion of pro-inflammatory cytokines such as TNF- α , IFN- γ , and IL-6, causing local inflammatory exacerbation manifested by polyadenopathy, necrosis, or fistula formation.

In our case, the child initially presented with a single node that evolved into multiple left-sided cervical lymphadenopathies with a 4 × 2 cm fistula after two months of therapy, consistent with a paradoxical reaction. The absence of rifampicin resistance, good adherence, and rapid improvement after corticosteroid therapy confirmed the diagnosis. This highlights the diagnostic challenge of paradoxical reactions, which can easily be mistaken for treatment failure or secondary bacterial infection.

Management of paradoxical reactions relies primarily on continuing the same anti-TB regimen, as the process is inflammatory rather than infectious. Short-course corticosteroid therapy (prednisone 0.5–1 mg/kg/day for 4–6 weeks) is recommended for symptomatic or suppurative forms to reduce inflammation and scarring. In our case, adjunctive corticosteroid therapy and limited surgical drainage resulted in rapid clinical improvement. Surgery plays a complementary role and should be restricted to superficial drainage, avoiding deep lymph node manipulation to prevent nerve injury and cosmetic complications. This conservative approach aligns with the recommendations of the **World Health Organization (2022)** and the **French Society of Otorhinolaryngology (SFORL)**, emphasizing multidisciplinary management involving infectious disease specialists, pediatricians, and ENT surgeons.

The prognosis of cervical tuberculous lymphadenitis complicated by paradoxical reaction is generally favorable when recognized early and managed appropriately. Most patients experience complete healing within weeks, although long-term follow-up is essential to detect delayed relapses, especially in children with

immature immune responses. In our case, the outcome was excellent, with no recurrence after 12 months of observation.

This case underscores the importance of recognizing paradoxical reactions during TB therapy in children. Early identification avoids misdiagnosis and inappropriate treatment modifications. Continuous clinical vigilance, multidisciplinary collaboration, and physician awareness are crucial to prevent complications and ensure optimal outcomes. This case also illustrates the benefits of an individualized and conservative approach in managing pediatric cervical tuberculous lymphadenitis in endemic settings.

III. Conclusion:

Cervical tuberculous lymphadenitis remains common in children from high-burden regions. Paradoxical reactions, though rare, must be recognized by clinicians to prevent diagnostic errors and inappropriate therapy. A multidisciplinary approach, careful follow-up, and good adherence to treatment are key to ensuring a favorable outcome.

Figures:



Figure 1: Left latero-cervical swelling with cutaneous fistulization observed two months after initiation of therapy, illustrating a paradoxical inflammatory exacerbation.

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