

A Case of Toxoplasmosis Mimicking Influenza and COVID-19: Diagnostic Pitfalls and Management Challenges

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Abstract

Background: Toxoplasmosis, caused by *Toxoplasma gondii*, is a globally prevalent parasitic infection that often presents with nonspecific symptoms, making diagnosis challenging, especially in immunocompetent individuals.

Case Presentation: We report a case of a 22-year-old immunocompetent male presenting with cervical lymphadenopathy, fever, and flu-like symptoms, initially misdiagnosed as influenza or COVID-19. Despite symptomatic treatment, his condition worsened. Serological testing confirmed acute toxoplasmosis (IgM: 6.64 IU/ml; IgG: 44 IU/ml). Ultrasonography showed hypoechoic cervical lymph nodes, consistent with lymphadenopathy. Treatment with azithromycin, pyrimethamine, and folic acid for 10 days led to complete symptom resolution.

Conclusion: This case highlights the importance of considering toxoplasmosis in the differential diagnosis of cervical lymphadenopathy, especially in patients with persistent flu-like symptoms. Early serological testing and imaging are crucial for accurate diagnosis and timely intervention. The rapid clinical improvement observed underscores the effectiveness of antiparasitic therapy in immunocompetent individuals. Greater clinician awareness of the diverse presentations of toxoplasmosis is essential to prevent misdiagnosis and optimize patient outcomes.

Keywords: Toxoplasmosis, Cervical lymphadenopathy, *Toxoplasma gondii*, Immunocompetent host, Azithromycin, Pyrimethamine

1. Background

Lymphadenitis refers to an acute or chronic infection of one or multiple lymph nodes.¹ This condition can present with various types of non-purulent or caseous pus in different body regions, including the neck, below the chin, above the collarbone, armpits, and groin.² Lymphadenopathy, characterized by lymph node enlargement, often indicates an underlying infectious process.² When encountering an infection, lymph nodes—essential components of the immune system—may swell as they filter pathogens and produce immune cells to combat the infection.³ Enlarged lymph nodes can be tender to the touch and are commonly found in the cervical, axillary, and inguinal regions.² Various infectious agents, including viruses, bacteria, fungi, and protozoa, can cause lymphadenopathy.⁴

Toxoplasmosis is a parasitic infection caused by *Toxoplasma gondii* and is a common cause of lymph-

adenopathy.⁵ The primary mode of transmission is the ingestion of oocysts, with felids serving as the definitive hosts of the parasite.⁶ In individuals with a healthy immune system, toxoplasmosis symptoms are typically mild and transient, often presenting as swollen lymph nodes and a brief fever.⁷ However, in immunocompromised individuals, the disease can take a more severe clinical course, particularly due to the reactivation of dormant parasites or new infections, and may affect the central nervous system.⁷

While symptoms in immunocompetent individuals are typically mild and self-limiting, they can be more severe and persistent in immunocompromised individuals, such as those with HIV/AIDS or those undergoing immunosuppressive therapy.⁸ Failure to recognize toxoplasmosis can lead to misdiagnosis and inappropriate treatment, potentially worsening the condition.⁸ Therefore, clinicians should include toxoplasmosis in the differential diagnosis

of lymphadenopathy, particularly in high-risk populations, to ensure timely and effective intervention. Diagnostic methods such as serological testing and imaging can confirm *Toxoplasma gondii* infection, guiding appropriate therapeutic strategies and improving patient outcomes.

In this study, we report a case of a 22-year-old immunocompetent male who presented with cervical lymphadenopathy, fever, and flu-like symptoms, initially misdiagnosed as influenza or COVID-19.

2. Case Presentation

We present the case of a previously healthy 22-year-old man who was admitted to our tertiary care hospital with a two-week history of progressive neck swelling (cervical lymphadenopathy), localized tenderness, fever, malaise, and myalgias (Figure 1). Over the following days, the patient reported that his symptoms began to resemble an upper respiratory tract infection, and he was initially given supportive treatment for a presumed case of influenza or COVID-19. However, despite worsening neck tenderness and a low-grade fever (38.2 °C), his condition did not improve, prompting further investigation.



Figure 1. Clinical Presentation of a 22-year-old Male with Toxoplasmosis lymphadenopathy. Left submandibular lymph node enlargement with localized swelling and tenderness. Serological testing and ultrasonographic imaging confirmed the diagnosis.

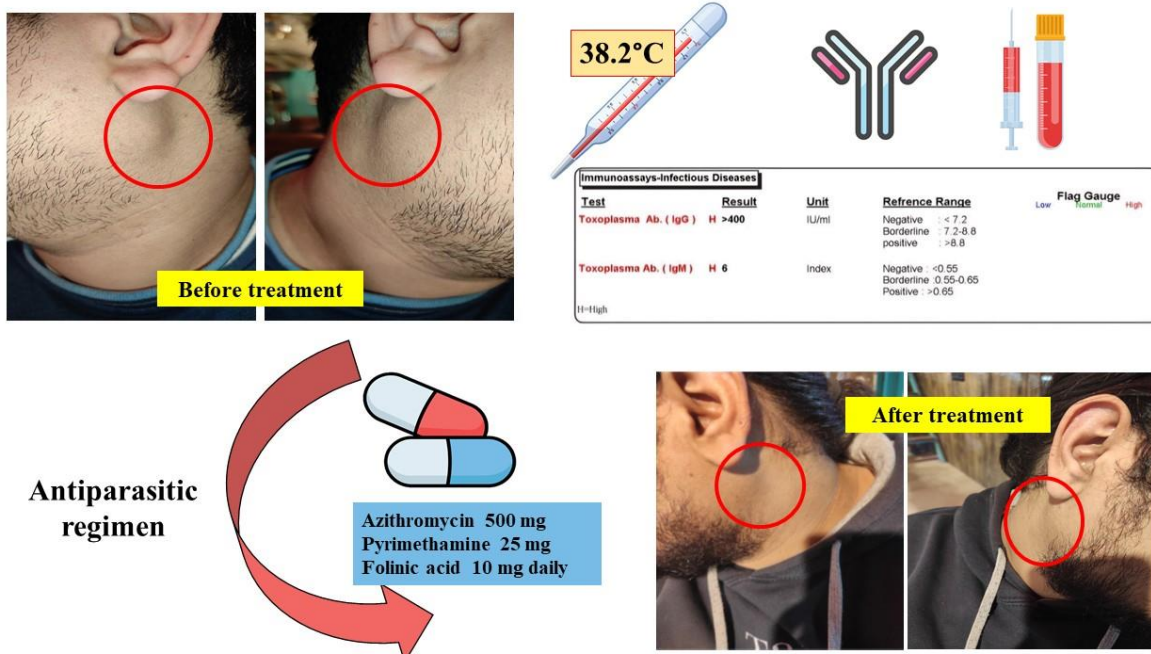


Figure 2. Case Presentation of Toxoplasmosis-Induced Cervical Lymphadenopathy. The top panel shows enlarged lymph nodes before the initiation of treatment, along with serologic positivity for *Toxoplasma gondii* and concomitant fever. Part two of the article covers the proposed antiparasitic treatment: Azithromycin, Pyrimethamine, and Folic acid. The lower half demonstrates lymph nodes after treatment, serving as an indicator of the therapeutic efficacy of the regimen.

On examination, thin, firm, and mobile lymph nodes were palpated bilaterally in the cervical region, with a

greater prominence in the left submandibular area. No other significant lymphadenopathy or organomegaly was

detected. Initial laboratory tests revealed leukocytosis with lymphopenia and elevated inflammatory markers (C-reactive protein: 32 mg/L). Serological tests for viral and bacterial pathogens, including Epstein-Barr virus, cytomegalovirus, and streptococcal infections, were negative. However, serology for *Toxoplasma gondii* showed positive IgM (6.64 IU/ml; normal range <0.55 IU/ml) and IgG (44 IU/ml; normal range <4 IU/ml), consistent with acute *Toxoplasma* infection.

Neck ultrasonography using a multi-frequency superficial probe revealed multiple oval, hypoechoic lymph nodes. Additionally, two lymph nodes were identified in the anterior cervical chain of the left submandibular area, measuring 10 × 20 mm and 12 × 18 mm. A hypoechoic lymph node measuring 11 × 24 mm was also noted in the right posterior cervical chain. These findings were consistent with lymphadenopathy, with no evidence of suppuration or abscess formation. Based on clinical, serological, and imaging findings, toxoplasmosis-induced cervical lymphadenitis was diagnosed.

The patient was started on a targeted antiparasitic regimen consisting of oral azithromycin (500 mg daily for 10 days, or twice weekly if intolerant), along with pyrimethamine (25 mg daily) and folinic acid (10 mg daily) to prevent hematological toxicity. Supportive care, including antipyretics and adequate hydration, was also provided. The patient tolerated the treatment well, with no reported toxicities.

During follow-up, significant clinical improvement was observed after completion of the treatment course, with complete resolution of neck pain and swelling (Figure 2). Subsequent serologic testing showed a decline in *Toxoplasma*-specific IgM levels and persistently elevated IgG, indicating a resolving acute infection. The patient was advised to continue folinic acid supplementation for two weeks and undergo routine follow-up to monitor for recurrence.

3. Discussion

Toxoplasmosis is a globally distributed zoonotic disease caused by the obligate intracellular parasite *Toxoplasma gondii* and presents with a broad spectrum of clinical manifestations.⁹ While the disease is often asymptomatic or self-limiting in immunocompetent individuals, it can manifest as cervical lymphadenopathy, fever, and flu-like symptoms, as observed in this case.⁸ The nonspecific nature of these symptoms can complicate the diagnostic process, as they overlap significantly with more common viral illnesses such as influenza or COVID-19, potentially leading to delayed diagnosis or misdiagnosis.¹⁰

This case highlights the importance of considering toxoplasmosis in the differential diagnosis of persistent lymphadenopathy, particularly in regions with a high *Toxoplasma gondii* seroprevalence.¹¹ Serological testing in this patient revealed elevated IgM (6.64 IU/ml) and

IgG (44 IU/ml) titers, indicative of an acute *Toxoplasma gondii* infection. IgM antibodies typically appear within the first week of infection, peaking at 1–2 months, while IgG antibodies rise more gradually and persist for life.¹¹ The presence of both IgM and IgG confirms a recent infection, as IgM serves as a marker of recent exposure, while IgG indicates an ongoing immune response. Serological testing remains the cornerstone of toxoplasmosis diagnosis, with IgM and IgG titers playing a crucial role in distinguishing acute from chronic infections.¹²

Several studies have suggested that vitamin levels play a crucial role in the immunopathogenesis of toxoplasmosis. Recent research has highlighted the effects of vitamin D and other micronutrients on the immune response against *Toxoplasma gondii*. Jalalizadegan et al.¹³ emphasize the potential adjunctive role of nutritional assessment in patients with toxoplasmosis, particularly those with atypical presentations.

Ultrasonographic findings of hypoechoic, oval-shaped lymph nodes in the cervical chain confirmed our diagnosis of toxoplasmosis-induced lymphadenitis. In toxoplasmosis, lymph nodes are typically well-defined and hypoechoic, without a necrotic center—features that help differentiate it from lymphadenopathy secondary to malignancies or tuberculosis.¹⁴ The absence of suppuration or abscess formation in this case aligns with the known non-purulent nature of toxoplasmosis.¹⁵

Additionally, recent data suggest that integrating ultrasound imaging features with serological markers can facilitate the early differentiation between toxoplasmosis and other causes of lymphadenopathy, leading to a more targeted management approach.¹⁶

The treatment of toxoplasmosis in immunocompetent patients remains a subject of debate, as the infection is often self-limiting. However, treatment is recommended for severe or persistent symptoms, as was the case in our patient. A combination therapy was chosen for its efficacy and tolerability.¹⁷ Azithromycin, a macrolide antibiotic, acts against *Toxoplasma gondii* by inhibiting protein synthesis,¹⁸ while pyrimethamine, a dihydrofolate reductase inhibitor, is a cornerstone of toxoplasmosis treatment. The addition of folinic acid prevents the hematological toxicity associated with pyrimethamine.¹⁰ This regimen led to rapid clinical improvement in our patient, demonstrating its effectiveness in acute toxoplasmosis.

Cervical lymphadenopathy has a broad differential diagnosis, including infectious, neoplastic, and autoimmune etiologies. Common viral infections such as Epstein-Barr virus (EBV) and cytomegalovirus (CMV) were excluded in this case through serological testing. Bacterial infections, including tuberculosis, can also present as cervical lymphadenopathy; however, ultrasonography did not reveal caseation or necrotic changes, making this diagnosis unlikely.¹⁴ Other differential considerations included lymphoma and metastatic disease, but the

benign ultrasonographic characteristics and the patient's resolution of symptoms with antiparasitic therapy ruled out these possibilities.

This case underscores the importance of a multi-disciplinary approach in the diagnosis and management of toxoplasmosis. Accurate diagnosis and timely treatment require collaboration between clinicians, radiologists, and laboratory specialists. A combined serologic and imaging-based diagnostic strategy, as demonstrated in this case, is essential for guiding appropriate therapeutic interventions.

In conclusion, toxoplasmosis should be considered among the rare causes of cervical lymphadenopathy, particularly in cases presenting with an acute onset or flu-like symptoms that do not respond to standard therapies. Early serological testing and imaging play a vital role in ensuring accurate diagnosis and prompt treatment. This case highlights the need for a high index of suspicion for toxoplasmosis in immunocompetent patients, as delays in diagnosis can lead to prolonged morbidity and treatment.

4. Conclusion

This report highlights the challenges of diagnosing and treating toxoplasmosis in immunocompetent individuals, particularly when the presentation mimics more common viral infections such as influenza or COVID-19. In this case, the presence of hypoechoic cervical lymphadenopathy on ultrasonography, along with positive IgM and IgG titers on serologic testing, confirmed acute toxoplasmosis. The patient's rapid clinical improvement following treatment with azithromycin, pyrimethamine, and folinic acid suggests the efficacy of this regimen in immunocompetent hosts.

Early diagnosis, supported by imaging and serological testing, is crucial in preventing misdiagnosis and ensuring timely management. This review outlines the diverse clinical manifestations of toxoplasmosis in immunocompetent patients while emphasizing the importance of a multi-disciplinary approach to optimize patient outcomes. Future studies should further investigate long-term treatment outcomes in this patient population.

Author Contributions

TE, FK, and FG contributed to the diagnosis and treatment of the parasitic infection. MM, HT, SH, and BB participated in the analysis of laboratory findings and disease differentiation. Notably, all authors contributed to the manuscript writing.

Conflict of Interest Disclosures

All authors declared that they have no conflict of interest.

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