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Case Report

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Parotid Swelling Unmasked: Tuberculosis Masquerading as Pleomorphic Adenoma

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HIGHLIGHTS

- Parotid TB mimics adenoma
- FNAC enables accurate diagnosis
- AFB staining confirms tuberculosis
- ATT avoids unnecessary surgery
- Early suspicion improves outcomes

Key Words:

Parotid tuberculosis
Pleomorphic adenoma mimic
FNAC
Acid-fast bacilli
Salivary gland swelling
Anti-tubercular therapy

ABSTRACT

Introduction: Tuberculosis involving the parotid gland is an exceedingly rare manifestation, representing less than 0.1% of all tubercular infections. Its clinical and radiological resemblance to benign parotid tumors, especially pleomorphic adenoma, often leads to diagnostic confusion and unnecessary surgical interventions. **Aims & Objectives:** This case report aims to describe an unusual presentation of parotid tuberculosis initially misdiagnosed as pleomorphic adenoma, to highlight the diagnostic utility of fine-needle aspiration cytology (FNAC) and Ziehl–Neelsen staining, and to emphasize the importance of clinical suspicion in endemic regions. **Case Presentation:** A 62-year-old male presented with a slow-growing, painless swelling in the right parotid region of several months' duration, associated with intermittent low-grade fever. Clinical examination revealed a firm, ill-defined swelling below the pinna. Ultrasonography showed a heterogeneous lobulated lesion in the superficial lobe of the parotid, raising suspicion of pleomorphic adenoma. FNAC and Ziehl–Neelsen staining were performed to establish the diagnosis. **Results:** Cytological examination revealed epithelioid cell granulomas, lympho-histiocytic clusters, and necrosis. Ziehl–Neelsen staining demonstrated acid-fast bacilli with 3+ positivity, confirming the diagnosis of parotid tuberculosis. The patient was started on standard anti-tubercular therapy (ATT) as per national guidelines. Remarkable clinical improvement with significant regression of the swelling was observed within weeks of therapy, avoiding unnecessary surgical excision. **Conclusion:** Parotid tuberculosis, though rare, should be considered as a differential diagnosis in patients presenting with parotid swelling, especially in tuberculosis-endemic regions. Its clinical and imaging resemblance to pleomorphic adenoma makes diagnosis challenging. FNAC combined with AFB staining remains the cornerstone for diagnosis, allowing prompt initiation of medical management and preventing unwarranted surgical interventions. A high index of suspicion, supported by cytopathological evidence, is essential for timely recognition and treatment.



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INTRODUCTION

Tuberculosis (TB) remains one of the most significant infectious diseases worldwide, caused by *Mycobacterium tuberculosis*, with the lungs being the primary site of infection. However, extrapulmonary manifestations are not uncommon, especially in endemic countries like India. Among the various extrapulmonary sites, involvement of salivary glands is exceedingly rare, accounting for less than 0.1% of tubercular cases. Within the salivary glands, the parotid gland is most frequently affected, but the diagnosis often poses a challenge because its clinical features mimic those of benign and malignant parotid neoplasms [1,2].

Clinically, parotid tuberculosis typically presents as a slowly enlarging, painless swelling, which closely resembles the presentation of pleomorphic adenoma, the most common benign salivary gland tumor. Both entities share overlapping features such as firm consistency, gradual progression, and absence of acute inflammatory signs, often leading to misdiagnosis. Radiological imaging further complicates the diagnostic process, as ultrasonography and computed tomography (CT) may reveal heterogeneous lobulated lesions that can be indistinguishable from neoplastic conditions [3].

Historically, parotid gland TB has been underrecognized because clinicians seldom consider it in the absence of a prior history of tuberculosis or systemic symptoms. In many cases, patients do not exhibit pulmonary involvement, which further decreases suspicion. This frequently leads to unnecessary surgical procedures such as superficial parotidectomy under the assumption of pleomorphic adenoma or other tumors [4]. The gold standard for diagnosis is demonstration of acid-fast bacilli (AFB), but cytological techniques like fine-needle aspiration cytology (FNAC) remain the first-line diagnostic approach due to their simplicity and accuracy. FNAC findings of epithelioid granulomas, caseous necrosis, and Langhans giant cells, when

combined with Ziehl-Neelsen staining, are highly suggestive of TB. In regions where tuberculosis is endemic, such cytological examination plays a pivotal role in distinguishing infectious causes from neoplastic lesions [5].

The management of parotid tuberculosis is primarily medical, relying on standard anti-tubercular therapy (ATT) as per World Health Organization and national guidelines. Early diagnosis not only spares patients from unnecessary surgery but also ensures timely treatment, resulting in rapid clinical improvement [6]. **Figure 1.** Diagnostic approach to parotid tuberculosis mimicking pleomorphic adenoma. FNAC demonstrates granulomas, caseous necrosis, and Langhans giant cells, while AFB staining confirms *Mycobacterium tuberculosis*. Early diagnosis enables anti-tubercular therapy (ATT) and prevents unnecessary parotidectomy.

Devi RS, et. al; 2024; highlighted a 62-year-old male with a parotid swelling initially suspected to be pleomorphic adenoma based on clinical and radiological findings. The diagnosis of tuberculosis was established through FNAC and Ziehl-Neelsen staining, and the patient demonstrated significant clinical improvement with ATT. This case underscores the importance of maintaining a high index of suspicion for tuberculosis in chronic parotid swellings, particularly in endemic regions, and emphasizes the role of cytopathological examination in avoiding unwarranted surgical interventions [7].

CASE PRESENTATION

A 62-year-old male presented to the outpatient department with a complaint of a gradually increasing swelling in the right parotid region for the past several months. The swelling was painless, non-tender, and associated with intermittent low-grade fever but without constitutional symptoms such as weight loss, night sweats, or loss of appetite. There was no history of tuberculosis,

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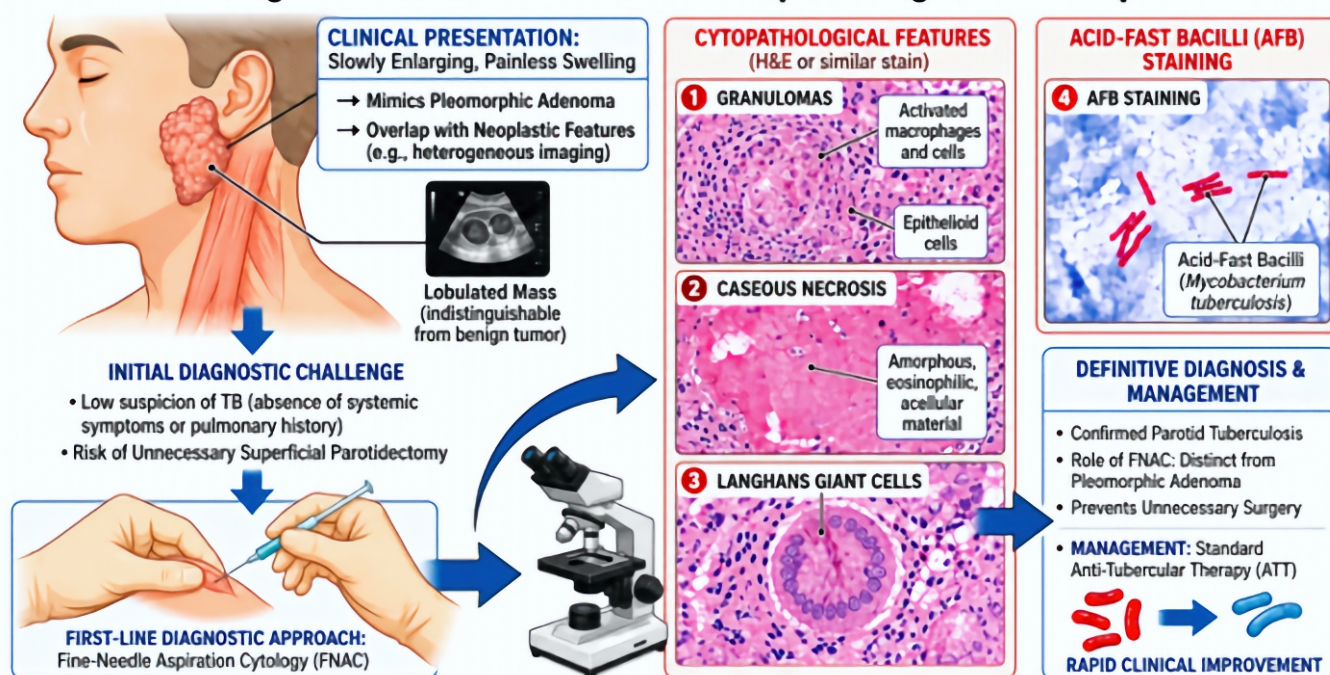


Figure 1: Diagnostic approach to parotid tuberculosis mimicking pleomorphic adenoma.

chronic cough, or contact with patients suffering from TB. On clinical examination, a firm, ill-defined swelling measuring approximately 3×1.5 cm was noted just below the right pinna. The overlying skin was normal, without redness or local rise of temperature. The swelling was non-fluctuant, non-transilluminant, and not fixed to deeper structures. Regional lymphadenopathy was absent except for a few small, palpable cervical nodes in level II that were clinically reactive. Based on the clinical findings, a provisional diagnosis of benign parotid neoplasm, most likely pleomorphic adenoma, was considered (**Figure 2**).

Ultrasonography of the neck revealed a heterogeneous, hypoechoic, lobulated lesion in the superficial lobe of the right parotid gland, with suspicion of an exophytic component. No abscess cavity or calcification was identified. The lymph nodes in levels I and II were enlarged but appeared reactive. The radiological impression favored a benign salivary gland tumor, strengthening the clinical suspicion of pleomorphic adenoma. To establish a definitive diagnosis, fine-needle aspiration cytology (FNAC) was performed.

The smears revealed epithelioid cell granulomas, clusters of lymphohistiocytic cells, and areas of necrotic debris. No evidence of neoplastic cells was observed. Ziehl–Neelsen staining of the aspirate demonstrated acid-fast bacilli (3+ positivity), confirming the diagnosis of parotid tuberculosis (**Figure 3**).

The patient was started on standard anti-tubercular therapy (ATT) as per national tuberculosis control guidelines. Within weeks of initiation, a remarkable reduction in the size of the swelling was observed, accompanied by resolution of fever and overall clinical improvement. No surgical intervention was required, and the patient was advised to complete the full course of ATT with regular follow-up.

This case illustrated how parotid tuberculosis can masquerade as pleomorphic adenoma, leading to diagnostic challenges. However, timely use of FNAC and AFB staining allowed accurate diagnosis and avoided unnecessary parotidectomy (**Figure 4**).

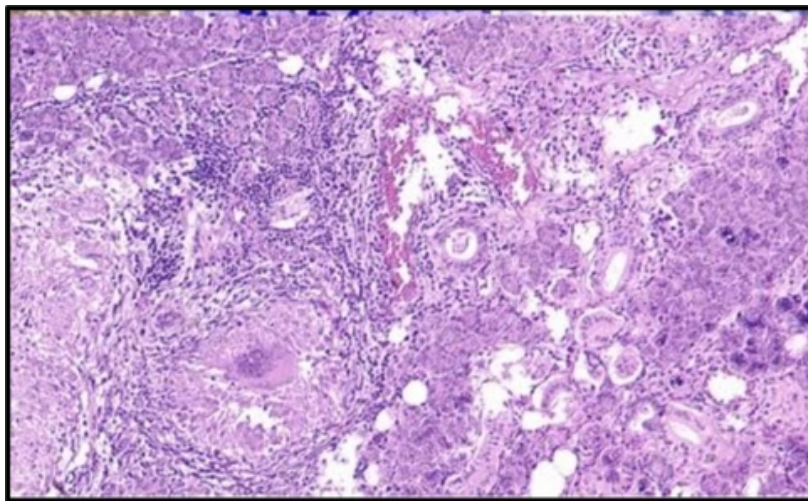


Figure 2: Histopathology section showing granulomatous inflammation with multinucleated giant cells

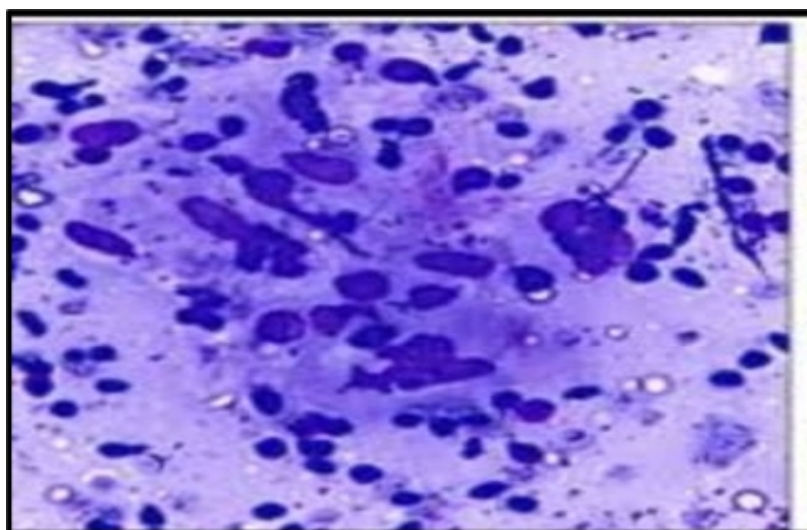


Figure 3: Cytology smear showing epithelioid histiocytes and multinucleated giant cells

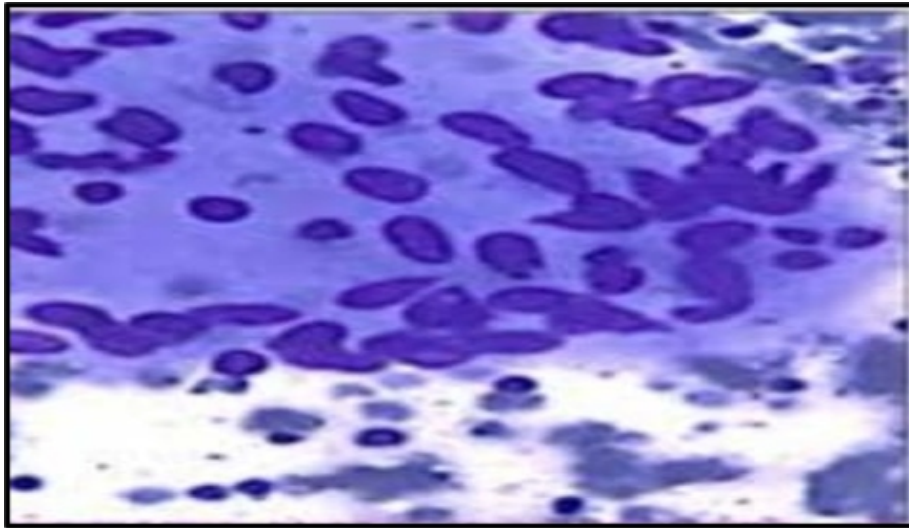


Figure 4: Cytology smear with numerous epithelioid histiocytes in cohesive clusters

DISCUSSION

Tuberculosis of the salivary glands, particularly the parotid, is a rare occurrence. Its incidence is less than 0.1% of all tubercular infections, yet it continues to pose significant diagnostic dilemmas due to its nonspecific presentation. The parotid gland is susceptible to TB via two possible routes: ascending infection from the oral cavity through Stensen's duct or hematogenous spread from a distant focus. In many cases, including the present one, there is no active pulmonary or systemic tuberculosis, making primary parotid tuberculosis a distinct clinical entity [8,9].

Clinically, parotid TB often mimics benign or malignant tumors. The typical presentation is a slow-growing, painless mass without inflammatory signs. These features are nearly identical to those of pleomorphic adenoma, the most common benign parotid tumor. Radiological investigations such as ultrasound, CT, or MRI can demonstrate a heterogeneous mass but are usually insufficient to differentiate between neoplastic and infectious lesions. Hence, reliance on imaging alone frequently results in misdiagnosis [10].

Fine-needle aspiration cytology (FNAC) is pivotal in distinguishing parotid TB from neoplasms. In this case, FNAC revealed epithelioid granulomas, necrosis, & lymphohistiocytic infiltration, consistent with granulomatous inflammation. Ziehl Neelsen staining demonstrated AFB, which confirmed the diagnosis. The accuracy of FNAC in salivary gland tuberculosis has been reported to be high, and it prevents unnecessary invasive procedures [11,12].

Management of parotid tuberculosis is primarily medical. Standard anti-tubercular therapy (ATT) is effective in achieving complete resolution. Surgery is rarely indicated, except in cases of diagnostic uncertainty or complications such as abscess formation. Early & accurate diagnosis is crucial, as unnecessary parotidectomy carries risks such as facial nerve injury, Frey's syndrome, & cosmetic deformities [13]. The presented case emphasizes that even in the absence of a history of tuberculosis or systemic involvement, parotid TB should be considered in the differential diagnosis of parotid swellings, especially in endemic

areas. The absence of pulmonary signs should not exclude TB as a potential cause. Clinicians should maintain a high index of suspicion and utilize cytopathology and microbiological staining techniques for confirmation [14].

Thus, this case reinforced the importance of integrating clinical, cytological, and microbiological findings for accurate diagnosis. It also highlights the role of ATT in providing a complete cure, underscoring that parotid TB is a medical disease rather than a surgical one [15].

CONCLUSIONS

Parotid tuberculosis is an uncommon yet important clinical entity that can closely mimic pleomorphic adenoma, resulting in diagnostic and therapeutic challenges. Its rarity, absence of systemic features, and nonspecific imaging findings contribute to frequent misdiagnosis. This case reinforced the crucial role of FNAC and Ziehl–Neelsen staining in confirming the diagnosis, thereby facilitating effective medical management with ATT. Maintaining a high index of suspicion in endemic regions is essential to avoid unnecessary surgical interventions. Early recognition and appropriate therapy ensure favorable outcomes and highlight tuberculosis as a great masquerader in salivary gland pathology.

CLINICAL SIGNIFICANCE

This case highlighted the clinical challenge of differentiating parotid tuberculosis from pleomorphic adenoma. Both conditions present with similar features, including slow, painless enlargement of the parotid gland without acute inflammatory signs. Imaging studies often fail to clearly distinguish between infectious and neoplastic lesions, leading to frequent misdiagnosis. The clinical significance of this report lies in emphasizing the role of FNAC and Ziehl–Neelsen staining in establishing a definitive diagnosis. Prompt recognition of parotid TB enables initiation of anti-tubercular therapy, which results in excellent outcomes without surgical morbidity. Unnecessary surgical procedures such as parotidectomy not only expose patients to complications like facial nerve damage and cosmetic

deformity but are also avoidable with accurate diagnosis. Therefore, in tuberculosis-endemic regions, clinicians must always consider parotid TB in the differential diagnosis of salivary gland swellings, even in the absence of systemic symptoms or previous tuberculosis history.

ABBREVIATIONS

AFB: Acid-Fast Bacilli

ATT: Anti-Tubercular Therapy

FNAC: Fine-Needle Aspiration Cytology

TB: Tuberculosis

ZN stain: Ziehl–Neelsen Stain

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AUTHOR CONTRIBUTIONS

All authors significantly contributed to the study conception and design, data acquisition, or data analysis and interpretation. They participated in drafting the manuscript or critically revising it for important intellectual content, consented to its submission to the current journal, provided final approval for the version to be published, and accepted responsibility for all aspects of the work. Additionally, all authors meet the authorship criteria outlined by the International Committee of Medical Journal Editors (ICMJE) guidelines.

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CONFLICT OF INTEREST

Authors declared that there is no conflict of interest.

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CONSENT FOR PUBLICATION

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The authors confirm that no AI & LLM tools were used in the writing or editing of the manuscript, and no images were altered or manipulated using AI & LLM.

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