

Primary sinonasal tuberculosis without conventional symptoms of TB: Case Report

Mohsen Barzegar¹ , Seyed Hossein Tabatabaei² , Naeimeh Kheirandish^{2*} , Seyed Mojtaba Alavikia¹ 

1. Department of Oral and Maxillofacial Surgery, School of Dentistry, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

2. Department of Oral and Maxillofacial Pathology, School of Dentistry, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

* Correspondence: Naeimeh Kheirandish. Department of Oral and Maxillofacial Surgery, School of Dentistry, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. Tel: +989131561614; Email: kheirandish1382@gmail.com

Abstract

Tuberculosis (TB) remains one of the world's most persistent infectious diseases, with pulmonary involvement being its most frequent clinical presentation. However, extrapulmonary forms of TB, although relatively rare, continue to pose diagnostic and therapeutic challenges because of their atypical and nonspecific symptoms. This report presents the case of a 35-year-old male who was admitted with gradual, progressive facial swelling, without nasal obstruction, rhinorrhea, or respiratory complaints. Given the absence of conventional symptoms of TB, the patient underwent comprehensive diagnostic evaluations to rule out neoplastic, granulomatous, or infectious conditions. Investigations included fine needle aspiration (FNA), chest computed tomography (CT), incisional biopsy of the affected area, and Ziehl-Neelsen staining, which revealed the presence of acid-fast bacilli. Histological and microbiological examinations ultimately confirmed the diagnosis of primary sinonasal tuberculosis, an extremely rare manifestation of extrapulmonary TB. The patient was started on a standard anti-tubercular regimen and monitored closely for six months, during which substantial clinical improvement was observed. Facial swelling resolved, with no evidence of recurrence. This case illustrates the diagnostic complexity of atypical presentations of TB and emphasizes the importance of maintaining a high index of suspicion, especially in TB-endemic regions. Sinonasal tuberculosis can easily mimic neoplasms or other chronic inflammatory conditions, potentially leading to misdiagnosis. Timely recognition and proper management are crucial for improving patient outcomes. This report provides valuable insight into the limited literature on primary sinonasal TB without nasal obstruction and highlights the need for increased awareness among healthcare professionals when evaluating similar head and neck presentations.

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Introduction

Tuberculosis, one of the oldest known human infectious diseases, is one of the major causes of mortality and health problems in developing countries and is caused by *Mycobacterium tuberculosis* or *Mycobacterium bovis* (1-3). Extrapulmonary tuberculosis is a rare condition that affects organs and tissues other than the lungs, such as the pleura, pericardium, and perihilar lymph nodes within the thorax. Up to 15% of tuberculosis manifestations have been reported as extrapulmonary tuberculosis (4). The first report of extrapulmonary tuberculosis in the human nose was made by an Italian anatomist who studied the effects of tuberculosis on human organs (5).

The patient in the present study was a 35-year-old man who complained of facial swelling on the right side of the face in the infraorbital region (Figure 1A). The patient's facial swelling had started during the previous year. Despite receiving oral and injectable antibiotics, there was no improvement in the healing process of the facial swelling. The patient had no headache, dizziness, or fever. The lymph nodes were normal. No abnormalities were found on examination of the organs, motor limbs, head and neck movements, thorax, or heart and lung auscultation (Figure 1B). Ocular examination showed consistency and erythema of the right lower eyelid associated with the infraorbital region on the right side. The lesion had a firm consistency but was not tender to touch. Ear health was confirmed by the relevant tests. Bilateral nasal airflow was normal. There was no history of obstruction or tenderness hematoma. The mandibular border was palpated and was not tender. The sinus tract was found without purulent discharge in the right buccal vestibule of the maxilla. Swelling and firm consistency were reported, associated with tenderness and erythema without warmth in the buccal and infraorbital regions. Normal nerve conduction was reported. The patient's occlusion could not be evaluated because of the absence of posterior teeth. Mobility and hematoma were not observed on the floor of the mouth. Purulent exudate discharge in region 6 was associated with a vestibular fistula. Evaluation of the

patient's CT scan showed a soft tissue tumor with erosion without perforation of the maxillary bone in the anterior wall of the right maxillary sinus, with haziness in the maxilla in the premolar and molar area as well as the wall of the right maxillary sinus (Figure 1C). After FNA biopsy and diagnosis of a giant cell tumor of soft tissue, re-biopsy was recommended to rule out malignancies (Figure 1D and 1E). ZN staining confirmed the presence of TB bacteria (Figure 1F). Given the extremely rare occurrence of primary sinonasal tuberculosis and its nonspecific clinical manifestations, diagnosis can be challenging, particularly in patients presenting without conventional symptoms of tuberculosis. Furthermore, this condition may clinically and radiographically mimic other inflammatory or neoplastic lesions of the maxillofacial region, potentially resulting in delayed diagnosis and inappropriate management. Therefore, reporting such rare cases is important to increase clinicians' awareness, highlight the need to consider tuberculosis in the differential diagnosis of atypical facial swelling, and facilitate early diagnosis and timely treatment.

Case Presentation

The patient was prepped and draped by the anesthesia service after tracheal intubation. A pharyngeal tube (Pack) was then inserted. Access to the lesion was obtained after dissection following a Weber-Ferguson incision on the right side. After extraoral osteotomy, the anterior wall of the right maxillary sinus at the lesion site was separated from the sinus mucosa. It was then completely removed from the soft tissues after dissection and sent to the pathology laboratory.

In general, hemostasis was established in the right infraorbital nerve region. The wound sites were sterilized with normal saline solution and hydrogen peroxide. After that, gelfoam was placed in the extraction site to aid stabilization of blood clots. Both mucosal and skin incisions were then sutured with vicryl and nylon. The wounds were bandaged, the pharyngeal pack was removed, and the patient was delivered to the anesthesia service in good general condition.

The submitted specimen contained 3 parts of soft tissue with dimensions of $5 \times 3 \times 1.5$ cm, cream color, and firm consistency, and was processed in 3 numbers. Microscopic examination revealed a fibrous vascular background of granulomatous (Tubercle) aggregates with definite boundaries, including histiocytes, lymphocytes, and scattered Langhans-type multinucleated giant cells. Due to positive ZN staining, the diagnosis was in favor of tuberculosis.

Pulmonary tuberculosis was excluded based on the absence of respiratory symptoms, normal chest imaging findings, and negative clinical evaluation for active pulmonary involvement, confirming the diagnosis of primary sinonasal tuberculosis.

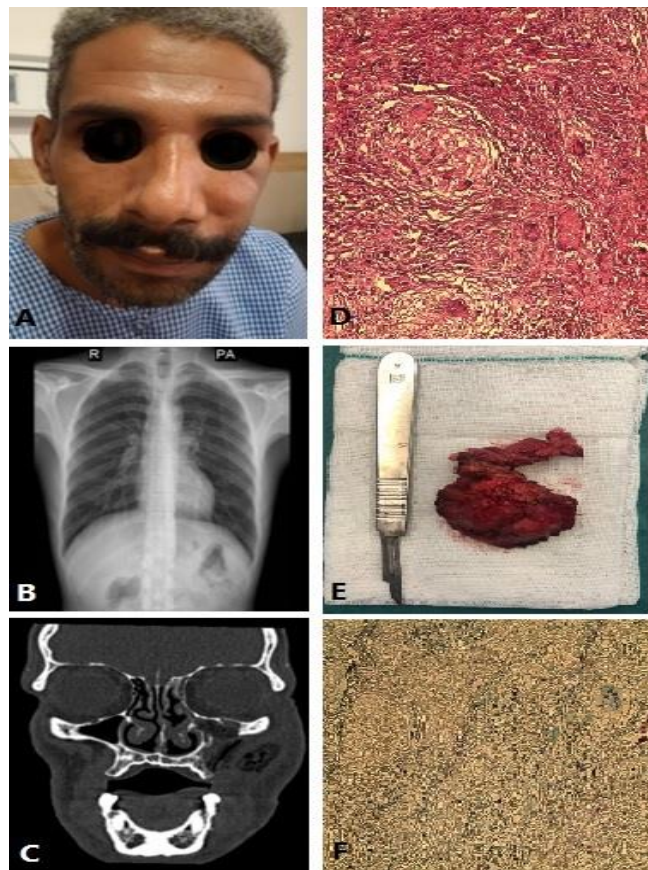


Figure 1. A: Clinical view, B: Chest radiography C: Skull CT, D: H&E staining E: Gross, F: ZN staining

Discussion

It has been reported that extrapulmonary tuberculosis occurs in approximately 15-20 percent of all cases of tuberculosis in immunocompetent individuals (6). It has also been suggested that primary involvement of the sinonasal system in TB infection occurs very rarely (7), but may be present while the lungs are healthy in all aspects (8-10). Patients usually have normal physical health (10,11), and, as in the sample studied here, it is more common in adults.

Maxillary sinus involvement can occur through TB-infected droplets in the eyes (12), nose (10), and teeth (13). Symptoms of TB in the paranasal sinuses can vary and may appear as nonspecific signs. The most common symptom of TB is nasal obstruction, followed by nasal discharge (10,14), which did not appear in the studied sample of the present study. Other symptoms of TB include mucosal thickening of the sinuses (11,13), nasal polyps (12,13), malodor (10), hemoptysis (11), purulent manifestations (9,10,15), bone erosion (11,13), sinus tract (15), and, rarely, hyperplastic changes, tuberculous granuloma formation (8,13,15), and haziness of the sinus environment (13,15). The results showed chronic firm facial swelling and erythema in the infraorbital region associated with a vestibular fistula and pus secretion in the sample studied in the present study.

Some researchers have also mostly reported normalized serological tests (12,13) and increased ESR (8-12).

In the advanced stages of the disease, sinonasal involvement usually occurs under the prevalence of TB disease. Some researchers have also stated that untreated dental infection-induced maxillary sinus

involvement is the main cause of the above involvement (13), while fungal and malignant infections should also be considered. It was stated that allergic fungal sinusitis often occurs due to *Aspergillus* and eventually results in granulomatous microabscesses without necrosis or invasion. Fungal cell wall staining includes PAS and methenamine silver (11).

The appearance of wavy or hyperplastic inflammation in the sinonasal region may be a sign of different types of malignancy (15), such as differential diagnoses of squamous cell carcinoma (SCC), non-keratinized carcinoma, and malignancies of the salivary glands and endocrine glands. In this study, histopathological examination, together with positive Ziehl-Neelsen staining, confirmed the diagnosis of primary sinonasal tuberculosis in the absence of pulmonary involvement.

In this regard, it has been reported that methods such as serological tests, PPD, histopathological analysis, and PCR (11) can be used to diagnose *Mycobacterium tuberculosis*.

In histopathological examination, the formation of deformed granulomas associated with necrosis, epithelioid (Langhans) cells, histiocytes, lymphocytes, plasma cells, and giant cells (13) is observed in TB disease. It is noteworthy that although caseous necrosis is not a specific symptom of this disease, it distinguishes TB disease from other types of granulomatous diseases, including Wegener's granulomatosis and sarcoidosis. ZN staining confirms the presence of an acid-fast bacillus that causes tuberculosis (9). On the other hand, there are some reports that PCR diagnosed TB disease in the absence of AFB. The use of the PPD test in the diagnosis of TB disease was also positive in most cases (11) and has been reported as negative in some cases (9).

Treatments for this disease include an anti-TB regimen of ATT and surgical operation, although the latter method has been rejected by some researchers (13). In contrast, the surgical method was performed in the present study. The ATT regimen includes rifampin (45 mg), ethambutol (800 mg), isoniazid (300 mg), and pyrazinamide (750 mg), and vitamin B-6 was also used in the patient's treatment in the present study. In some studies, steroids (20 mg prednisolone daily) were used to reduce swollen lymph nodes (8). On the other hand, ethambutol was not used in some studies to avoid inflammation of the optic nerve (11). In addition to the above, antibiotic treatment was used in the present study but had no positive effects on treatment of the disease. This result was in line with the results of some researchers (9,13,15). Since the lesion was completely excised surgically, the independent effect of anti-tuberculosis therapy on the resolution of facial swelling could not be accurately assessed. Clinical improvement was most likely attributable to complete surgical removal, while postoperative anti-tuberculosis therapy was administered to prevent recurrence and ensure complete disease control.

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None.

Ethical Statement

This study was approved by the Ethics Committee of Shahid Sadoughi University of Medical Sciences under the ethical code of IR.SSU.SRH.REC.1400.030.

Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

M.B. contributed to the clinical diagnosis and management of the patient and critically reviewed the manuscript. S.H.T. assisted in the pathological analysis and interpretation of the histological data. N.K. contributed to the concept and design of the case report, conducted the literature review, and drafted the initial manuscript. S.M.A. supported radiological evaluations and imaging interpretation and contributed to manuscript revisions. All authors read and approved the final manuscript and agreed to be accountable for all aspects of the work.

Data Availability Statement

The data that support the findings of this study can be requested from the corresponding author.

Use of Artificial Intelligence

Artificial intelligence was used to edit the English text.

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