Primary Nasal Tuberculosis

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Varun Jerath,1 Bipin Kishore Prasad,2 Yamuna Ranganathan,1 Sunil Goyal1

ABSTRACT

Introduction
Tuberculosis, considered a major global and public health challenge, not only manifests in the lungs but also affects other sites. Tuberculosis primarily occurring in the nose, poses a diagnostic challenge, as the clinical presentations of other important pathologies such as infective and inflammatory diseases, granulomatous disorders and neoplastic conditions are similar, have an indolent course and are non-specific. Moreover, due to its rarity, it is often missed and not considered in differential diagnosis. It is hence felt that a series of three cases of Primary Nasal Tuberculosis, conclusively diagnosed within a year, merits reporting.

Case Report
A series of 03 cases, presented with complaints of nasal obstruction, crusting in nasal cavity, intermittent epistaxis, conclusively diagnosed as a case of primary nasal tuberculosis.

Conclusion
Primary nasal tuberculosis is rare. One should have a high index of suspicion in patients living in endemic areas not responding to routine treatment and presenting with nasal mass and crusting.

Keywords
Primary Nasal Tuberculosis; Lupus; Extra Pulmonary Tuberculosis; Granulomatous Disease

Nobel Laureate Robert Koch discovered Tubercle Bacillus in 1882 which was named Mycobacterium tuberculosis (Mtb) in 1886.1 Tuberculosis (TB) is considered a major global and public health challenge even today. The disease in human host commonly manifests in the lungs and is referred to as pulmonary TB (PTB), but it can also affect other sites and is then referred as extra-pulmonary TB (EPTB). EPTB accounts for 15% of newly diagnosed TB cases worldwide, of which 10–35% manifest in the head and neck region.2

In India, the incidence was noted to be 2.1 million cases in the year 2013, 16% of which were new cases of EPTB.3 The data proves that EPTB is a global as well as national health issue with huge morbidity burden.

The rising incidence of EPTB may be due to rising numbers of immune-compromised population. Tissues other than lung parenchyma may get infected either ‘primarily’ by direct infection or ‘secondarily’ by haematogenous/lymphatic spread, ingestion of infected sputum, or by contagious spread from adjacent organ. The sites commonly affected in EPTB are lymph nodes, meninges, skin, pleuro-pericardium, abdomen, eyes, genito-urinary tract, and upper aero-digestive tract. Primary nasal tuberculosis is extremely rare clinical manifestation caused by Mtb even in high prevalence country.4

TB, primarily occurring in the nose, poses a diagnostic challenge because the clinical presentations of other important pathologies such as infective and inflammatory diseases, granulomatous disorders and neoplastic conditions are similar, have an indolent course and are
non-specific. Moreover, due to its rarity, it is often missed and not considered in differential diagnosis.

It is hence felt that a series of three cases of Primary Nasal Tuberculosis (PNTB), conclusively diagnosed within a year, merits reporting.

Case series

Case 1
A 42 years old female, on regular medication for diabetes, hypertension and hypothyroidism, presented with complaints of nasal obstruction, pain and crusting for five months. She was treated as a case of chronic rhinosinusitis by a general physician for one month without benefit. She denied any history of anosmia, headache, facial pain, fever, and weight loss. There was no history of trauma to the nose or of nasal surgery.

Anterior rhinoscopy revealed, deviated nasal septum (DNS) to left and crusts filling right nasal cavity with inflammation of surrounding nasal mucosa. Diagnostic nasal endoscopy (DNE) revealed inflamed, polypoidal, tender and friable mucosa of nasal floor, anterior end of inferior turbinate and corresponding septum (Fig. 1a & b).

Her blood counts, C reactive protein, autoimmune workup, test for Human Immuno-deficiency Virus and erythocyte sedimentation rate were within normal limits. Chest radiography revealed normal findings. Mantoux test result and serology for Veneral Disease were negative. Interferon Gamma release assay and sputum for acid fast bacilli (AFB) was also negative. Histopathological examination (HPE) of the biopsy tissue from nasal lesion was reported showing well defined epithelioid cell granuloma with Langhan’s giant cell reaction and necrosis (Fig. 2). Further investigations directed at establishing the systemic presence of tuberculosis or existence of a primary focus, including microbiology of bronchoalveolar lavage and blood for the Mycobacteria Deoxyribonucleic acid polymerase chain reaction (DNA PCR) were negative.

Finally, a diagnosis of PNTB was made and the patient was treated with anti-tuberculosis drugs (ATD) for six months with regular endoscopic follow-up. Two biopsies, taken one month apart, after completion of six months of ATD, were reported normal. She continued to be disease-free nine months after completion of ATD (Fig 3 a, b).
A 42 years old male with no medical comorbidity presented with complaints of recurrent epistaxis both nostrils, intermittent nasal obstruction and crusting in both nostrils for 2.5 years. He also complained of change in skin colour over the tip of nose for 6 months. There was no history of trauma to the nose or of nasal surgery. Clinical examination showed erythema over the nasal tip and crusts in both nasal cavities. DNE confirmed the presence of crusts along with septal perforation involving both cartilaginous and bony parts. Fleshy friable mucosa in the floor of nasal cavities, both sides, bled on probing. Purulent discharge was noticed in bilateral middle meatal region (Fig. 4 a, b).
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Fig. 4a. & b. Endoscopic view showing fleshy friable mucosa in the floor of nasal cavities with crusts and septal perforation.

Fig. 5a. & b. Photograph of the patient with Lupus vulgaris during and after ATD.
His routine blood investigations were normal. ESR level was elevated. Viral markers, VDRL and autoimmune workup to rule out other granulomatous diseases were negative. Nasal swab for TB PCR and AFB were negative. Biopsy from the lesion was suggestive of granulomatous disease, though AFB and fungal stain were negative.

In view of epithelioid cells and granuloma, not responsive to antibiotics, patient was diagnosed as a case of nasal TB and started on ATD. While undergoing anti TB therapy, the redness of tip of his nose spread to columellar skin and down to the upper lip. It was diagnosed as Lupus Vulgaris (Fig. 5 a & b). ATD was continued for nine months as per Revised National Tuberculosis Control Programme (RNTCP) guidelines for treatment of Ear, Nose, Throat TB. Two biopsies from nasal floor mucosa, taken after completion of ATD, were reported negative for Mtb.

Case 3
A 33 years old male, with no comorbidity, presented with gradually progressive obstruction in right nostril of 3 months duration. There was no history of trauma to the nose or of nasal surgery. His external nasal pyramid looked normal, Anterior rhinoscopy did not reveal any abnormality. DNE revealed a globular mass with smooth surface covered by pink mucosa arising from posterior 2/3rd of inferior turbinate reaching upto choana on the right (Fig. 6a). Radiological image revealed the same mass (Fig.6b).

HPE of punch biopsies taken from growth, showed a necrotizing granulomatous lesion, likely tuberculosis. Tissue was lined by stratified squamous epithelium. Underlying stroma shows lymphoid cells along with numerous coalescing granulomas of varying sizes composed of plump histiocytes and epithelioid cells. Scattered
Langhan’s giant cells and areas of central breakdown in granuloma were also seen. TB PCR was also positive for Mtb.

Patient was started on ATD therapy consisting of Isoniazid, Rifampicin, Pyrazinamide, and Ethambutol for two months during initial phase (2HRZE) and on Isoniazid and Rifampicin for four months of continuous phase (4HR). Patient has been on regular endoscopic follow-up and is disease free.

Discussion

Italian anatomist Giovanni Battista Morgagni was the first person to document ulcerations in the nose, soft palate and nasopharynx with presence of tubercles in the year 1761, during an autopsy of a young man with similar lesions in the lungs. Many authors have given credit to W.F. Clarke of presenting the first case of EPTB in head neck region in 1876 in the Pathological Society of London, though the lesions described were ulcers with tubercles without the demonstration of the bacillus of Robert Koch. The disease is still considered a rarity in nose, but increasing number of cases have since been reported with different presentations, such as mimicking granulomatous lesion, resembling malignant tumour or masquerading as malignant granuloma.

Nose and paranasal sinuses have unique epithelial architecture, robust muco-ciliary clearance mechanism, bactericidal nasal secretions and mechanical barrier of vibrissae and hence, are believed to be most resistant anatomic region to tuberculous invasion. The region may still get affected following inhalation of infected particles, traumatic inoculation, immunocompromised status or a combination of these factors. In our case series, one patient (Case 1) was diabetic.

Tuberculosis seldom occurs primarily in nose. Nasal TB occurs secondary to either a PTB or a retrograde involvement of the nose by lupus vulgaris of the facial skin. Lupus vulgaris is known to precede features of frank nasal tuberculosis, but its manifestation during the course of antitubercular drug therapy was indeed a surprise finding for us in Case No. 2. It is a known fact that lupus vulgaris usually develops by contiguous, haematogenic or lymphatic spread from a tuberculous focus elsewhere, or from external inoculation. The authors have not come across any such case documented in scientific publication. PNTB, though earlier reported to be occurring more commonly in female, Khan S et al found equal incidence in male and female in a review of published data of 15 years, from year 2000 to 2015, yielding 29 cases of PNTB. Like PTB, PNTB also occurs more commonly in those in the lower socio-economic strata in adult population. It usually presents unilaterally, but in one-third of the patients, it can be bilateral. All three patients in our series belong to low socioeconomic strata but with no history of contact. One patient (Case 2) had bilateral disease while the other two had unilateral disease.

Majority presents with nasal obstruction, epistaxis, crusting, pain, dryness of the nose or post-nasal discharge. These symptoms are very similar to other common nasal pathologies causing delay in diagnosis and worse missing the disease, which also happened in our patients.

The lesion can be proliferative, infiltrative, or ulcerative. These granulomas are usually pale red or pink and have slightly roughened or granular surfaces. The nasal obstruction which often ensues is not only because of granuloma alone, but is the result of crust formation. Disease usually affects the nasal septum (cartilaginous part) first, followed by nasal cavity mucosa and anterior part of inferior turbinate. Lesion spreads to the skin of face and nose with the lupus variety of tuberculosis, but it can otherwise spread to paranasal sinuses, choana, nasopharynx, orbit, and cranial cavity.

Nasal endoscopy allows a detailed evaluation of nasal cavity, and since nasal secretion swab seldom shows the presence of AFB or its colony growth on culture, it is important to take tissue biopsy in suspected cases. A patient hailing from a Tuberculosis geographical belt having relevant clinical features and not responding to usual therapy for rhinosinusitis should be further investigated for TB. Diagnosis can be confirmed by the presence of caseating granuloma on biopsy and demonstration of Mb on PCR.
Basic principles of treatment of PTB are also applicable for EPTB. Standard chemotherapy regimen covering 6 months with 2 months of ‘Intensive phase’ instituting Rifampicin, Isoniazid, Ethambutol, and Pyrazinamide (2EHRZ) and 4 months of ‘Continuation phase’ instituting Rifampicin and Isoniazid (4HR) has been recommended by World Health Organization.\(^{12}\) The clinicians can also follow Guidelines on EPTB for India published by Government of India, supported by WHO India, under RNTCP where a regime constituting 2EHRZ plus 4-7 HR has been advocated for the treatment of Ear, Nose, Throat TB.\(^{13}\) Adequate local treatment including frequent nasal douching and removal of crusts is also important. Surgery is considered only to treat complications or for reconstruction of nose.

**Conclusion**

Primary nasal tuberculosis is a rare clinical entity. Most of the patients present with nasal obstruction, blood-stained nasal discharge, crusting, post nasal drip and nasal ulcerations. With nasal endoscopes in vogue, one must not shy away from using them for looking into nasal cavities and taking biopsy in case of any pathology is seen in nasal cavity. It was interesting to find lupus vulgaris developing during the course of the treatment of one of our cases of nasal tuberculosis which we do think possible since it is known to develop by contiguous spread from a tuberculous focus. Histopathology of nasal lesions is necessary for confirmation of diagnosis. Nasal TB can be treated effectively with anti-tubercular therapy, with maximal benefit and minimal morbidity. Lastly, one should have a high index of suspicion in patients living in endemic areas not responding to routine treatment and presenting with nasal masses and crusting.

**References**

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