Tuberculosis of Olfactory Area: A Rare Presentation

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Abstract Nasal tuberculosis is a rare clinical entity even in developing countries where tuberculosis of respiratory tract is extremely high. It becomes more difficult to diagnose if it presents with symptoms which are not commonly associated with nasal tuberculosis. Here we report the diagnosis, treatment and follow up of a rare case of primary nasal tuberculosis of olfactory groove region. Early diagnosis and timely treatment will certainly reduce the morbidity of this disease.

Keywords Tuberculosis · Olfactory area · Anti Koch treatment

Abbreviations

CT	Computed tomography
MRI	Magnetic resonance imaging
ANCA	Anti neutrophilic cytoplasmic antibody
TB	Tuberculosis
PAS	Periodic acid schiff
GMS	Gomori methamine silver
AFB	Acid fast bacilli

HPE	Histo pathological examination
AKT	Anti-Koch's treatment
RNTCP	Revised national tuberculosis control programm

Introduction

Upper respiratory tract tuberculosis is uncharacteristic and presents in 1.8% of all patients suffering from tuberculosis [1]. Tuberculous involvement of nose, nasopharynx and paranasal sinus is extremely rare even in countries with a high incidence of pulmonary disease [2]. Tuberculosis involvement of nose is usually secondary to the tuberculosis of lungs or larynx, though in rare instances primary infection can occur at nose [3, 4]. A diagnosis is established on the basis of anamnesis, rhinoscopy, nasal endoscopy, biopsy and histopathological verification, as well as additional diagnostic methods (biochemical blood analysis, serology, isolation of mycobacterial tuberculosis complex, radiological investigation). The definite diagnosis is established by biopsy and histopathological verification of Langerhan's cells [5]. In this we report a case of tuberculosis of olfactory area.

Case Report

A 32 year old female, nurse by profession presented with complain of progressive loss of sense of smell since 1 month, which was preceded by an upper respiratory tract infection, treated conservatively. No complain of blood stained/watery discharge from nose. Even after the treatment there was no improvement and gradually patient

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Fig. 1 Pre treatment CT scan

Fig. 2 Pre treatment MRI scan

developed complete loss of smell and decreased taste sensation. Clinical examination and routine investigations were normal. Radiological investigation revealed enhancing soft tissue along the roof of nasal cavity approximately measuring 2.5×1.4 cm with discontinuity of cribriform plates on either side on computed tomography (CT) scan (Fig. 1). These findings were confirmed with magnetic resonance imaging (MRI) (Fig. 2). The differential diagnosis as per imaging included olfactory neuroblastoma, Wegener's granulomatosis and carcinoma.

Additional investigations to confirm diagnosis and to exclude pulmonary tuberculosis were done including routine haematological, biochemical, serology, X-ray chest which were normal. Special laboratory tests C-ANCA, P-ANCA done were normal. CT chest done in view of

Fig. 3 Histopathological examination

pulmonary TB was normal. After excluding pulmonary tuberculosis she was planned for endoscopic endonasal biopsy, which was suggestive of granulomatous lesion with extensive caseation. Histiocytic infiltration and Langerhan's type of giant cells were seen. Thickened blood vessels were seen. No fungus, no tumour cells were seen. Nasal respiratory epithelium was ulcerated. Special stains for PAS, GMS and AFB were negative. Vasculitis was not seen (Fig. 3).

With the HPE report, patient was started on Anti-Koch's treatment (AKT) as per revised national tuberculosis control programme (RNTCP) guidelines. After completion of 6 weeks of treatment, repeat MRI was done which was suggestive of substantial regression of the abnormal soft tissue thickening in the superior nasal fossa along the midline anterior nasal septum. Anti-tubercular treatment was continued. Symptomatically some smell sensation improved but patient developed parosmia (perverted sense of smell). After couple of years smell sensation improved but did not recover to normal. Taste sensation also improved. MRI was repeated post treatment (Fig. 4) and after 2 years (Fig. 5) which showed complete resolution.

The patient is on regular follow up including comprehensive clinical and nasal examination and she is disease free at this time.

Conclusion

Tuberculosis, both pulmonary and extrapulmonary is a major health problem, which is caused by mycobacteria tuberculosis complex. It usually affects the lungs, although other organs are involved in up to one third of cases. The nose is least liable to invasion by acute tuberculosis of any part of the respiratory tract because of the structure of mucosa, respiratory movements of cilia and bactericidal

Fig. 4 Post treatment MRI scan

Fig. 5 Post treatment MRI scan after 2 years

secretions. However, nose can become infected either directly (primarily) through the air current by people sneezing or coughing or by direct inoculation by finger borne infection and by instrumentation. Indirectly (secondarily) the nose may become infected through the blood and lymph vessels [6]. It is twice as common in females as in males and common in people living in unhygienic surroundings with poor health [7]. The anterior portions of the

inferior turbinate are frequently involved. Involvement of posterior nares is rare and nasal floor is almost spared [8, 9]. Direct extension of infection from nose to ethmoid sinus may occur. The organism may spread into the sphenoid, frontal or maxillary sinus involving the sinus ducts. The orbit may be invaded and infection can extend to cranial cavity [3, 10]. In our case the area affected was the roof i.e. olfactory area and only symptom was loss of sense of smell.

The diagnosis is difficult because in nasal tuberculosis signs and symptoms are nonspecific [11]. A definite diagnosis is made by identifying or isolating tuberculous bacilli from tissue removed during biopsy or surgery. Biopsies of non-caseating granulomas are confusing histologically, and these cases are often misdiagnosed as Wegener's granulomatosis [12, 13].

Medical imaging can be useful, but should be reserved for specific indications. CT is ideal for investigation of sinus and nasal diseases. MRI is superior to CT to discriminate soft tissue but MRI is less sensitive to bone abnormalities or landmarks [14].

Accordance of current TB incidence trends, it would be kept in mind of infectious disease specialist as well as ENT specialist to consider TB as a potential entity when encountering an unusual lesion in the nasal cavity [15, 16].

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Informed Consent Informed consent was obtained from the individual participant included in the study.

Human and Animal Rights All applicable international, national, and/or institutional guidelines for the care and use of the human participant were followed.

References

1. Prasad BK, Kejriwal GS, Sahu SN (2008) Case report: nasopharyngeal tuberculosis. *Indian J Radiol Imaging* 18(1):63–65
2. Lau SK, Kwan S, Lee J, Wei WI (1991) Source of tubercle bacilli in cervical lymphadenopathy: a prospective study. *J Laryngol Otol* 105:558–561
3. Page JR, Jash DK (1974) Tuberculosis of the nose and paranasal sinuses. *J Laryngol Otol* 88:579–583
4. Purohit SD, Gupta RC (1997) Primary tuberculosis of nose. *Indian J Chest Dis Allied Sci* 39:63–64
5. Nayar RC, Alkaabi J, Ghorpade K (2004) Primary nasal tuberculosis: a case report. *Ear Nose Throat J* 83(3):188–191
6. Goldberg B (1946) *Clinical tuberculosis*. FA Davis Company Publishers, Philadelphia
7. Sharn R (1981) Primary tuberculosis of the nose. *Practitioner* 225:1506–1507
8. Hyams VJ (1991) Pathology of the nose and paranasal sinuses. In: GM English, otolaryngology. JB Lippincott, Philadelphia, pp 24–25

9. Mignogna FV, Garay KF, Spiegel R (1996) Tuberculosis of the head and neck and oral cavity. In: Rom WN, Garay SM (eds) Tuberculosis. Little Brown and Company, Boston, pp 567–576
10. Leukins RM (1959) Tuberculosis of the nose and nasopharynx. In: Jakson C, Jakson C (eds) Diseases of the nose, throat and ear. WB Saunders, Philadelphia, pp 36–69
11. Hughes RG, Drake Lee A (2001) Nasal manifestations of granulomatous disease. *Hosp Med* 2:417–421
12. Fitzgerald DW, Sterling TR, Haas DW (2010) Mycobacterium tuberculosis. In: Mandell GL, Bennett JE, Dolin R (eds) Principle and practice of infectious diseases, 7th edn. Churchill Livingstone, Philadelphia, pp 3129–3163
13. Waldman SR, Levine HL, Sebek BA, Parker W, Tucker HM (1981) Nasal tuberculosis: a forgotten entity. *Laryngoscope* 91:11–16
14. Goetz CG (1999) Textbook of clinical neurology, 1st edn. W. B. Saunders Company
15. Gougen LA, Karmody CS (1995) Nasal tuberculosis. *Otolaryngol Head Neck Surg* 113:131–135
16. Johnson IJ, Soames JV, Marshall HF (1995) Nasal tuberculosis: an increasing problem? *J Laryngol Tool* 109:326–327