Case Report

Orbital tuberculosis with coexisting fungal (Aspergillus flavus) infection

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Abstract

Background: A coexisting invasive fungal and tubercular involvement of the skull base is a rare event. Co-infection has been reported with involvement of paranasal sinuses and middle ear cleft.

Case Description: We herein report a case of an elderly male diabetic patient who presented with gradually progressive visual loss, which on imaging showed an orbital lesion. Surgical decompression and microbiological evaluation showed growth of Mycobacterium tuberculosis and Aspergillus flavus.

Conclusion: Rare combinations of such infections do exist and should be treated aggressively to achieve good outcomes in a losing battle with fastidious organisms in the backdrop of compromised immunity.

Key Words: Aspergillus, co-infection, fungal, granuloma, orbital, skull base, tuberculosis

INTRODUCTION

Orbital lesions, pose a challenge as there are many mimics and imaging alone is not sufficient to diagnose the problem at large. Infections form an important differential diagnosis with the path of spread extending from the sinus to the skull, with an intervening orbit. Fungal lesions are important differentials to be considered, extending from paranasal sinuses to the skull base. Involvement of the bony orbit by tuberculosis has been sparingly reported. However, a combination of both these infections predominantly in the orbital soft tissue has not been reported till date. To be declared cured, both the infections require a protracted treatment. The challenge to cure multiples exponentially when these fastidious organisms invade synergistically a host marred with systemic illness/immune deficiency. We herein report the first ever case of co-infection in the skull base and orbit by Mycobacterium tuberculosis and Aspergillus flavus.

CASE REPORT

A 65-year-old male patient, with poorly controlled diabetes mellitus, presented to us with painless, progressive diminished vision in both eyes over 4 months (asymmetrical involvement; right eye defect more than left eye). On examination, right eye had only perception of light and left eye had vision of counting fingers up to 2 feet. Fundus showed features of optic atrophy. His neurological examination was unremarkable. There were no signs of meningeal irritation. He was negative for HIV, HBsAg and HCV done by ELISA as a routine presurgical investigation. His chest
X-ray was unremarkable. Mantoux was negative. Sputum AFB (done in the postoperative period after the tissue cultures showed growth of tuberculosis) was negative. Sputum for acid fast bacilli was negative. He had an FBS = 176 mg/dl, PPBS = 231 mg/dl, and Hb1Ac = 8.2%. Magnetic resonance imaging (MRI) of brain with orbit showed a lesion, which was heterogeneously hypointense on T1W and hyperintense on T2W, located in the orbit, encircling the optic nerve and was extending through the optic foramen into the cranial cavity. On gadolinium contrast T1W imaging, the lesion was brilliantly enhancing and was extending onto the planum sphenoidale [Figure 1]. Mild enhancement was also noted in the right orbit. The paranasal sinuses were normal. A working diagnosis of orbital meningioma was made. A left supraorbital craniotomy and deroofing of the orbit was followed by subtotal excision of the lesion. The tumor was grayish, mildly vascular, firm, nonsuckable and was encircling the left optic nerve and was extending into the optic canal. The frozen section examination was suggestive of granulomatous pathology and hence the specimen was subjected to microbiological examination as per our departmental protocol for suspected infections (aerobic, tubercular, and fungal staining, and cultures). Histopathological examination showed multi-septate hyphae suggestive of fungus. On day 5, growth of *Aspergillus flavus* was noted on fungal culture. The patient was started on antifungal drugs immediately (Inj. Voriconazole 400 mg on day 1 followed by 200 mg daily for 14 days, followed by oral Voriconazole 200 mg, twice daily for 4 weeks, to be reviewed with repeat imaging). On day 28, all three cultures tubes for tuberculosis [BACTEC 460 Tb system (Becton Dickinson, USA) using the 12 B vials] were positive. He was started on antitubercular drugs as per his body weight (Isoniazid 300 mg once a day, Rifampicin 600 mg once a day, Pyrazinamide 750 mg twice daily, Ethambutol 800 mg once a day, and Benadone 20 mg once a day). He was discharged on 14th postoperative day with no change in his visual status. He, however, had a cerebrovascular accident and succumbed to it on 38th postoperative day.

**DISCUSSION**

Tubercular foci maybe found in different tissues because of hematogenous spread of bacilli. Endemicity for tuberculosis may well be the explanation for the high incidence of orbital tuberculosis as compared with nonendemic countries. Orbital infections commonly manifest as osteitis, as no bone seems to be exempted from tuberculosis.[1] It is not always possible to find the primary source of tuberculosis or active systemic infection elsewhere.[4] Presence of secondary infection in a tubercular lesion is heard of and commonly seen in pulmonary sites, but its coexistence with fungal lesion is an rare entity.[3] Cases of mucormycosis with tuberculosis have been reported but its presence with *Aspergillus flavus* infection has not been reported. The diagnosis is based on positive culture of both *Mycobacterium tuberculosis* and *Aspergillus flavus*.

Detection of acid fast bacilli is difficult in pathological specimens especially extra-pulmonary as they are paucibacillary.[8]

The recommended treatment of orbital tuberculoma is wide surgical excision, supplemented by antituberculous chemotherapy for 18 months.[4,7]

Invasive fungal infection involving anterior skull base and brain is an opportunistic infection commonly caused by mucor and aspergillus. It usually occurs in patients with systemic illnesses and is associated with diabetes mellitus in up to 37%. Compromised immune system, uncontrolled diabetes mellitus, blood malignancies, severe burns, kidney disease, AIDS, immune deficiency following organ transplant, neutropenia, consumption of corticosteroids, chemotherapy, anemia, or malnutrition also predispose to such fastidious infections. The common sites of involvement in skull base and paranasal sinus include nose and orbital cavity (53.3%), anterior skull base and brain in conjunction with sinonasal (36.6%), and nasal cavity involvement (10%).[5] The management includes surgical debridement and chemotherapy along with control of primary disease. The chance of survival for the patient who has no underlying disease or diabetes is estimated at 80%. However, the chance of survival for a patient with a serious underlying disease is approximately 50%.

**CONCLUSION**

A combination of invasive fungal and tuberculous infection involving he orbit has never been described. This

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**Figure 1:** MRI brain T1W axial sections (a), T2W axial (b), FLAIR (c), showing hypointense lesions in the left orbit (shown with arrow). On Gadolinium contrast, the lesion is brilliantly enhancing (d, e)
case proves the synchronism of existence of two common opportunistic infections fungal and tuberculosis in an immunocompromised patient and such an occurrence could be very aggressive and devastating like in our case.

REFERENCES

1. Dewan T, Sangal K, Premsagar IC, Vashishth S. Orbital tuberculoma extending into the cranium. Ophthalmologica 2006;220:137-9.
2. Finn DG. Mucormycosis of paranasal sinuses. Ear Nose Throat J 1998;77:813, 816-8, 821-2.
3. Lee YH, Fan KS, Lai CL, Wang JD, Ho HC. Coexisting pulmonary tuberculosis and rhino-orbital mucormycosis in diabetes mellitus-A case report. J Intern Med Taiwan 2004;15:86-90.
4. Madge SN, Prabhakaran VC, Shome D, Kim U, Honavar S, Selva D. Orbital tuberculosis: A review of the literature. Orbit 2008;27:267-77.
5. Morteza Javadi, Shabahang Mohammadi. Fungal infection of the sinus and anterior skull base. Med J Islam Repub Iran 2008;22:137-40.
6. Raina UK, Jain S, Monga S, Arora R, Mehta DK. Tubercular preseptal cellulitis in children: A presenting feature of underlying systemic tuberculosis. Ophthalmology 2004;111:291-6.
7. Sen DK. Tuberculosis of the orbit and lacrimal gland: A clinical study of 14 cases. J Pediatr Ophthalmol Strabismus 1980;17:232-8.
8. Suchanda B, Alugolu R, Purohit A, Lakshmi V, Sundaram C. A rare concomitant tubercular and Fonsecaea pedrosoi fungal infection of the skull base. J Neurosci Rural Pract 2012;3:189-91.