

Orbital cold abscesses with associated pansinusitis and bone involvement: Case report

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ABSTRACT

Orbital involvement in tuberculosis is rare even in areas where TB is endemic. Orbital TB is classified into five forms; classical periostitis, orbital soft tissue tuberculoma or cold abscess with no bone destruction, orbital TB with bone destruction, orbital TB spread from para-nasal sinuses and tuberculous dacryoadenitis. We present a 17 year old patient who presented with a third recurrence of orbital and forehead abscesses. On orbital CT-scan, the patient had pan-sinusitis, right orbital and frontal abscesses, bilateral proptosis and frontal bone destruction. Initially the diagnosis of orbital TB was based on a good response to antituberculosis medications and it was later confirmed by histology showing caseating TB granulomas.

CASE REPORT

A 17 year old male patient presented with a third recurrence of right orbital and forehead swellings. He was first reviewed at his local district hospital seven months before the current admission with similar swellings. He was immediately referred to the nearest provincial hospital and a diagnosis of orbital cellulitis with orbital and forehead abscesses was made. Incision and drainage of the abscesses was done and a course of intravenous antibiotics given. The patient's condition improved and was allowed home.

The orbital and forehead swellings recurred gradually and three months later, the patient was taken back to the same provincial hospital. Incision and drainage was done again and the patient allowed home after a course of antibiotics. The swellings recurred three months later and this time round the patient was referred to Kenyatta National and Referral Hospital and that's when we took over his management.

In addition to the swellings, the patient had started coughing and complained of hotness of the body. He also reported that he was experiencing difficulties in breathing, night sweats and weight loss. There was no history of contact with someone with open TB and he reported that he had been admitted in hospital two years before with pneumonia from which he recovered fully.

On examination at admission, the patient was sick-looking, wasted, afebrile, not pale and not jaundiced. He had non tender, discrete and mobile sub-mental lymphadenopathy. On examination of the respiratory system, he had bilateral crepitations and ronchi on left lung fields but no signs of pleural effusions. The thyroid gland was noted to be prominent but it was not tender. Examination of the rest of the systems did not reveal any significant findings.

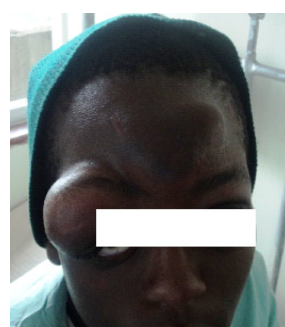
On ocular exam, the visual acuity was 6/36 for right eye (no improvement with refraction) and 6/6 for left eye. There was bilateral axial proptosis with a hertels reading of 23 and 24 for right and left eye respectively (base 110).

There was limited abduction for both eyes but he was orthophoric at primary gaze. There was an obvious forehead swelling and right upper lid swelling.

The forehead swelling was more on the right although it extended beyond the midline with a horizontal diameter of 70mm and vertical dimension of 20mm with overlying surgical scars and skin hyper-pigmentation. It was fluctuant, non-tender and not warm to touch. There was also a separate massive right eye lid swelling which was non tender, fluctuant and not warm. The overlying skin was shiny and the swelling was extending deep into the orbit.

On examination of the right eye, the anterior chamber was normal. A grade 2 RAPD was noted on examination of the pupils. On fundoscopy, the optic disc had blurred margins and the vessels were engorged. Choroidal folds were also noted. The rest of the retina was normal. The anterior segment and posterior pole of the left eye were normal (Figure 1).

Figure 1: Patient at admission



Laboratory tests and results were:

- (i) Full haemogram; HB 15.6 g/dl, white blood count 7,620 cells/mm³, neutrophils 38.4% and lymphocytes 23.1%
- (ii) ESR 22mm/hr
- (iii) Sputum for ZN stain – negative
- (iv) Pus aspirate for Gram stain – negative
- (v) Pus aspirate for ZN stain – negative for AAFB
- (vi) Pus aspirate for culture and sensitivity – negative

- (vii) HIV serology – negative
- (viii) Thyroid function tests – normal
- (ix) Urea, electrolytes and creatinine – normal

Radiological tests and results were:

- (i) Chest X-ray – normal
- (ii) Orbital/ head CT scan; bilateral proptosis, frontal and superior orbital ring enhancing hypo-dense lesions, erosion of the periosteum and anterior layers of the frontal bone leaving the surface un-even, all the sinuses were opacified. The extra-ocular muscles were normal. An impression of pan-sinusitis, orbital abscesses and chronic osteomyelitis was made. The differentials are as shown in Table 1.

Table 1: Differential diagnosis

Differential	For	Against
Cold orbital tuberculosis abscesses	Chronic Fluctuant masses, not warm Not tender Associated weight loss, night sweats CT scan findings	Negative stain on ZN Normal chest X-ray Reported initial response to antibiotics Bilateral proptosis
Bacterial orbital cellulitis with abscesses	CT scan findings	Chronic No fever, tenderness, warmth Gram stain no organisms Culture no growths
Fungal orbital disease	Chronic pan sinusitis	CT scan findings (abscesses unusual)
Thyroid orbitopathy	Bilateral proptosis Palpable thyroid gland	Normal thyroid function tests Orbital abscesses Pan-sinusitis Normal extra-ocular muscles
Orbital malignancy/ metastasis	Chronic	CT scan findings
Chronic osteomyelitis	Bone destruction Chronic Abscesses	Non tender, non warm abscesses Bilateral proptosis Pan-sinusitis

The plan of management was as follows;

- (i) Intravenous antibiotics – ceftriaxone and metro nidazole
- (ii) Oral salbutamol
- (iii) Physician review
- (iv) ENT review

The ENT surgeons reviewed the patient and recommended fenestrated endoscopic sinus surgery (FESS), ethmoidotomy, incision and drainage of the abscesses and biopsy of the tissues for ZN staining and histopathology. With signs of respiratory distress, the patient needed to be stabilized to withstand general anaesthesia. The condition of the patient was however noted to be worsening with the initial treatment and a decision to start him on anti TBs was made based on the clinical presentation. A dramatic improvement was noted in his general state after the anti-TBs were started. By the end of the second week of anti TBs, the proptosis had reduced in both eyes to a hertel reading of 22 to 23 for right eye and left eye respectively. The orbital and frontal swellings were also decreasing without drainage of the abscesses.

Figure 2: The patient at discharge



The patient was later taken for FESS and ethmoidotomy and the tissues taken for ZN staining and histology. The ZN staining was still negative for AAFB but the histology showed the typical caseating granulomas of orbital TB. The patient showed remarkable improvement and was discharged eight weeks after presentation for follow up in both ENT and eye clinics (Figure 2).

DISCUSSION

Involvement of orbital tissues by tuberculosis is rare even in places where the prevalence of pulmonary TB is high¹. Orbital TB is classified into five forms; classical periostitis, orbital soft tissue tuberculoma or cold abscess with no bone destruction, orbital TB with bone destruction, orbital TB spread from paranasal sinuses and tuberculous dacryoadenitis²⁻⁵. The reported patient had multiple presentations that included sinusitis, orbital abscesses, and periostitis and bone destruction. This was probably because of the long period taken before the right diagnosis was made and appropriate treatment initiated.

The primary focus of infection is usually pulmonary from where the infection spreads haematogenously. However extra-pulmonary tuberculosis, like abdominal TB and TB lymphadenopathy, can be the main source of

origin of orbital TB^{2,5}. Direct spread of TB from the paranasal sinuses as the primary source has also been documented^{2,5}. In the presented case, there were no reported signs and symptoms of pulmonary TB on the earlier admissions. He however presented with cough and difficulties in breathing with crepitations and ronchi at the reported admission. His chest X-ray however did not show any features of pulmonary TB. The patient could therefore have presented with a concurrent lower respiratory tract infection and the source of the orbital disease was most likely a direct spread from the paranasal sinuses.

Acid fast bacilli are difficult to detect from pus aspirates and pathological specimens, as was the case with this patient, and diagnosis of orbital TB is usually based on the following;

- (i) The positive tuberculin skin test.
- (ii) The caseating granulomas inflammatory lesion on histopathology, which is highly suggestive of active tuberculosis.
- (iii) Positive culture for mycobacterium tuberculosis if the specimen are obtained early in the course of the disease.
- (iv) The complete resolution of the disease with the specific antituberculous medications⁶.

The tuberculin skin test is not a good diagnostic indicator of TB in high prevalence areas like sub-Saharan Africa and some parts of Asia^{3,7} and that is why it was not considered for this patient. The diagnosis was therefore based on the patient's response to antituberculous drugs and was later confirmed by histology.

Other diagnostic modalities that can be considered include PCR and interferon based immunological tests (Quantiferon)³. PCR is considered due to its specificity for pulmonary TB (98% if AAFB positive, 40 – 77% if AAFB negative) and extra-pulmonary TB (93.7% -100%)². Chest X-ray and sputum for AAFB are also necessary in patients with extra-pulmonary TB even when they do not present with signs and symptoms of pulmonary TB.

In conclusion, the following lessons were learnt from the presented case;

- (i) Orbital cold abscesses should be considered in patients with chronic orbital abscesses not responding to conventional treatment.
- (ii) A negative staining for AAFB from an aspirate from orbital abscess or tissues taken for histology does not rule out orbital TB.
- (iii) Presence of caseating granulomas inflammatory lesions on histopathology are usually suggestive of active tuberculous granulomas and are very useful in the work up of patients with orbital TB.
- (iv) Some cases of orbital TB are diagnosed by a complete resolution of the disease with treatment.
- (v) Even though pulmonary TB is the commonest primary infection site, some cases of orbital TB spread contiguously from the paranasal sinuses.

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