CASE REPORT

Tuberculous scleral abscess with choroidal detachment

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SUMMARY

We present a case of ocular tuberculosis (TB) presenting as scleral abscess with choroidal detachment. A 60-year-old woman presented with intense pain, redness, watering and decreased vision in the right eye (RE) for 1 week duration. Slit lamp examination of RE revealed diffuse scleritis with two pus-pointing areas in the supero-temporal quadrant suggesting scleral abscess. Fundus examination of the RE showed choroidal detachment in the temporal and inferior quadrant. Left eye examination was unremarkable. Ziehl-Neelsen staining of scleral biopsy showed acid-fast bacilli. PCR of the scleral tissue was also positive for *Mycobacterium tuberculosis* genome. The final diagnosis of tuberculous scleral abscess with choroidal detachment was made and patient showed good response to antitubercular treatment. In countries endemic for TB, it should be considered as a differential diagnosis for scleral abscess, since prompt diagnosis and treatment will ensure good visual outcome as depicted in our case.

BACKGROUND

Infectious scleritis accounts for 5–10% of all scleritis cases.^{1–2} It can occur either by primary scleral infection or by secondary spread from adjacent keratitis or severe infectious endophthalmitis. It is important to diagnose underlying organism causing scleritis and immediately start the definitive treatment as delay in diagnosis can result in rapid spread of infection. *Pseudomonas aeruginosa* is the most common organism accounting for 85% of cases with bacterial scleritis.³ Other organisms reported include *Staphylococcus species*, *Streptococcus species*, *Haemophilus influenza*, *Stenotrophomonas maltophilia*, *Serratia marcescens*, *Nocardia* and fungus. Rarely, *Mycobacterium tuberculosis* (MTB) can cause scleritis, especially in endemic areas. Most of the cases reported in the literature describe anterior nodular type of tubercular scleritis.^{4–5} Also, these cases are mostly diagnosed on the basis of either positive Mantoux test or QuantiFERON-TB Gold test, which is indirect evidence of tuberculosis (TB).^{4–5} We report an interesting case of tubercular scleral abscess with choroidal detachment where scleral tissue biopsy showed acid-fast bacilli on Ziehl-Neelsen (ZN) staining and PCR was positive for MTB genome.

CASE PRESENTATION

A 60-year-old woman presented with 1 week duration of intense pain, redness, watering and decreased vision in the right eye (RE). She was

diagnosed as having nodular scleritis elsewhere and prescribed prednisolone drops six times a day but her symptoms worsened. She underwent an uneventful cataract surgery in RE 3 years ago with good postoperative vision. There was no history of trauma to RE. There was no history of similar symptoms in the past. She was a known case of hypertension on treatment. She did not give any history of TB or contact with TB patients. There were no symptoms in the left eye (LE).

On examination, best-corrected visual acuity (BCVA) was 6/18 in RE and 6/6 in LE. Intraocular pressure was 11 and 14 in RE and LE, respectively. Extraocular movements were full in both eyes. Under diffuse illumination, RE examination revealed diffuse scleritis with congestion of deep episcleral plexus and scleral oedema with two pus-pointing areas in supero-temporal quadrant suggestive of scleral abscess (figure 1). On anterior segment examination, RE had fine keratic precipitates, anterior chamber reaction 2+ and posterior chamber intraocular lens in the bag. Fundus examination of RE revealed normal disc, but there was choroidal detachment in the inferior and temporal quadrant (figure 2). B-scan of RE also confirmed the presence of serous choroidal detachment in the inferior and temporal quadrant (figure 3). There was no 'T' sign on B-scan. LE examination was normal.

INVESTIGATIONS

Complete haemogram showed total leucocyte count of 8200/ μ L, with differential count: neutrophils 63%, lymphocytes 28% and eosinophils 9%. Erythrocyte sedimentation rate was 35 mm/hour. Liver and renal function test were normal. Chest X-ray (PA view) was normal. Basic immunological work-up, including rheumatoid factor, antinuclear antibody and antineutrophil cytoplasmic antibody and serum angiotensin-converting enzyme level were normal. HIV serology was non-reactive. Mantoux test showed induration of 6 mm at 48 hours. Blood

Figure 1 Slit lamp photograph of RE showing diffuse severe scleritis with two pus-points (yellow arrow) in low (A) and high magnifications (B). RE, right eye.

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Figure 2 Fundus picture of RE showing choroidal detachment (white arrow) in inferior (A) and infero-temporal quadrant (B).

and urine cultures were sterile. Under local anaesthesia, scleral biopsy was performed by collecting the sample from the base after dissecting conjunctiva and de-roofing at the site of pus-pointing for microbiology evaluation. Care was taken not to perforate the globe. Gram's and Giemsa staining were negative. Potassium hydroxide 10% mount and calcofluor white preparations were negative. ZN staining showed acid-fast bacilli (figure 4). Bacterial and fungal cultures were sterile. PCR of the scleral tissue was positive for MTB genome IS6110. Systemic workup by an internist did not reveal any evidence of active pulmonary or miliary TB.

TREATMENT

The patient received standard antitubercular treatment comprising of intensive phase and maintenance phase. She received isoniazid (300 mg), rifampicin (600 mg), pyrazinamide (1500 mg), ethambutol (1000 mg) and pyridoxine (10 mg) during intensive phase for 2 months. During maintenance phase of next 4 months, she received isoniazid (300 mg) and rifampicin (600 mg). She was also started on topical amikacin sulfate 1% eye drops 6 times/day for 2 weeks and then 4 times/day for next 2 weeks. Topical prednisolone drops started elsewhere was stopped. The patient was compliant to treatment and completed the full course of treatment, despite frequent episodes of gastritis and vomiting.

OUTCOME AND FOLLOW-UP

Within 1 week of starting treatment, the patient was symptomatically better with decrease in congestion, disappearance of the pus-points and decrease in the height of choroidal detachment. At 1 month of treatment, scleritis healed with scleral thinning and complete resolution of the choroidal detachment (figures 5 and 6). At 2-year follow-up, the patient was off treatment, and the eye remained quiet with no recurrence.

DISCUSSION

Tuberculous scleritis can result either from direct invasion of sclera by MTB or as an immune-mediated reaction to MTB antigens.⁴ In a retrospective study involving 500 cases with scleritis, 9.4% had underlying infectious cause and TB accounted for 10.6% of these cases.³ This is relevant especially in developing countries that are endemic for TB. Scleral involvement in TB can occur as isolated scleritis or with the involvement of adjacent peripheral cornea as sclero-keratitis. Tuberculous scleritis usually presents as anterior nodular scleritis.⁴ Histologically, they are granulomas composed of epithelioid cells and inflammatory cells, the centre of which shows caseation and contains Langerhans multinucleated giant cells.⁵ If left untreated, the nodule can ulcerate centrally, turn yellow forming abscess and ultimately leading to globe perforation. Our case also had initial presentation of painful nodular scleritis that subsequently underwent necrosis with the formation of scleral abscess.

Figure 3 B-scan (longitudinal) of RE depicting choroidal detachment in inferior (A) and infero-temporal quadrant (B).

Figure 4 Ziehl-Neelsen staining of scleral biopsy showing acid-fast bacilli.

Infectious scleritis with choroidal detachments has been documented with bacterial and viral infections but tuberculous scleritis with choroidal detachments has never been reported.⁶⁻⁸ Choroidal detachment in this case could be because of

Figure 5 Sequential photograph of RE at 2 days (A), 1 week (B), 2 week (C) and 2 months (D) showing resolution of pus-point, congestion and scleritis with the development of scleral thinning.

associated cyclitis or involvement of underlying choriocapillaries, leading to capillary leak, and subsequent development of choroidal detachment.

Infectious scleritis should be suspected if scleritis is associated with purulent exudates or infiltrates, scleritis associated with scleral or conjunctival ulcers, scleritis with visible pus-points or scleral abscess or scleritis associated with hypopyon. But at initial stage of presentation, infectious scleritis may have presentation similar to autoimmune type and treatment with steroids can only lead to worsening of condition. Hence, in such cases, once the patient is started on steroids, it is important to closely monitor the symptoms and clinical signs. Infection should be suspected if the patient complains of worsening of pain or increase in scleral congestion or purulent discharge while on steroids.

Diagnosis of ocular TB is a challenge. In majority of cases, diagnosis is based on corroborative evidence such as positive purified protein derivative (PPD) test and chest X-ray and exclusion of other causes.⁵ Direct evidence for the presence of the

infectious agent in ocular tissue or fluid is ideal for establishing the diagnosis. This evidence could consist of positive culture, demonstration of acid-fast organisms under microscope or detection of bacterial genome by nucleic acid amplification procedures. Demonstration of acid-fast bacilli is a rapid method for the detection of mycobacterium. However, demonstration of acid-fast bacilli is possible on smear only when at least 10^6 organisms/mL are present in fluid or tissue. As in most cases ocular TB is pauci-bacillary in nature, the yield of organism from intraocular fluids is low and, therefore, direct microscopy of the smears is not often helpful in the diagnosis of intraocular TB. But, in cases having lesions with abundant caseation necrosis or those with endophthalmitis with high load of MTB may demonstrate acid-fast bacilli on smear. Thus, the high load of MTB in our case could have led to positive acid-fast staining. Another limitation of acid-fast staining is its inability to distinguish between MTB and *Mycobacterium* other than TB (MOTT). Therefore, detection of MTB growth on culture or detection of *Mycobacterium* genome on PCR is necessary for definitive diagnosis of MTB.^{9 10} In our case, positive acid-fast staining along with positive PCR for MTB genome and good response to first-line antitubercular treatment confirmed the diagnosis of tubercular scleral abscess.

Thus, we here report successful outcome in tubercular scleral abscess with choroidal detachment diagnosed based on demonstration of acid-fast bacilli on ZN staining and positive PCR for MTB genome from scleral tissue.

Figure 6 Fundus picture of RE at 2 months.

Patient's perspective

I am very happy that a correct diagnosis was made and appropriate treatment was instituted, preventing loss of vision in my right eye. During the course of treatment I had loss of appetite, loss of weight, nausea and vomiting. Yet I was compliant to the treatment, completed the full course of it and I am fully recovered from the same.

Learning points

- ▶ Tuberculosis (TB) should be considered as a differential diagnosis of infectious scleritis especially in endemic countries.
- ▶ Tuberculous scleritis can be associated with choroidal detachment.
- ▶ Though diagnosis of ocular TB is a challenge, lesions with high bacilli load as in endophthalmitis or scleral abscess can yield positive acid-fast staining if proper sampling is performed.

Contributors SMP is responsible for idea and writing. ASK is responsible for collection of data. SK is responsible for analysis of data. RS is responsible for analysis and interpretation of data.

Competing interests None declared.

Patient consent Obtained.

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