American Journal of Ophthalmology Case Reports 7 (2017) 59–61

Contents lists available at ScienceDirect

American Journal of Ophthalmology Case Reports

journal homepage: http://www.ajocasereports.com/

Case report

A novel clinical sign in intraocular tuberculosis: Active chorioretinitis within chorioretinal atrophy

Avinash Pathengay [a, *], Bhavik Panchal [a], Himadri Choudhury [a], Soumyava Basu [b], Nidhi Relhan [c], Harry W. Flynn Jr. [c]

[a] Retina and Uveitis Department, L V Prasad Eye Institute, GMR Varalakshmi Campus, Visakhapatnam, Andhra Pradesh, India
[b] Retina and Uveitis Department, L V Prasad Eye Institute, Bhubaneswar Campus, Bhubaneswar, Odisha, India
[c] Department of Ophthalmology, Bascom Palmer Eye Institute, University of Miami Miller School of Medicine, 900 N.W. 17th Street, Miami, FL, 33136, USA

ARTICLE INFO

Article history:
Received 6 December 2016
Received in revised form
22 March 2017
Accepted 2 June 2017
Available online 6 June 2017

Keywords:
Intraocular tuberculosis
Tubercular chorioretinitis
Chorioretinal atrophy

ABSTRACT

Purpose: To report a novel clinical sign in patients with intraocular tuberculosis. The current study is an observational consecutive case series of patients diagnosed with intraocular tuberculosis managed at a tertiary eye care centre from June 1, 2012 to December 31, 2015.
Observations: The diagnosis of intraocular tuberculosis was made in 6 patients based on ocular features suggestive of tuberculosis along with a positive tuberculin skin testing and chest X-ray consistent with tuberculosis. All patients presented with decreased visual acuity ranging from 20/25 to 20/400, anterior chamber reaction, vitritis, multifocal choroiditis and vasculitis. All patients had an area of active chorioretinitis within the zone of pre-existing chorioretinal atrophy, apart from various other signs suggestive of intraocular inflammation. All patients were started on anti-tubercular therapy for a period of 9 months alone or in combination with oral corticosteroids tapered over 3–4 months. A prompt response to the treatment with resolution of chorioretinitis within the chorioretinal atrophy occurred in all patients. In addition, there was resolution of vitritis and improvement in the visual acuity ranging from 20/20 to 20/40 at last follow-up.
Conclusions and importance: and Importance: Active chorioretinitis within an area of chorioretinal atrophy is a novel clinical sign that may indicate intraocular tuberculosis.
© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

The clinical diagnosis of intraocular tuberculosis (IOTB) poses a major challenge as it has protean manifestations.[1] A few clinical signs suggestive of intraocular tuberculosis have been described including broad-based posterior synechiae, retinal vasculitis with or without choroiditis, and serpiginous-like choroiditis.[2] However, the diagnosis can still be challenging in many patients.

A novel clinical sign, presence of active chorioretinitis within the chorioretinal atrophy was identified in 6 patients with posterior uveitis. This sign may indicate TB as a possible etiology.

2. Findings

The current study is an observational consecutive case series of patients diagnosed with intraocular tuberculosis managed at a tertiary eye care centre from June 1, 2012 to December 31, 2015. The study was approved by the institutional review board and adhered to the guidelines of the Declaration of Helsinki. A written informed consent was obtained from all the study patients.

Case 1 - A 51-year-old male presented with complaints of gradual painless diminution of vision in the right eye for the previous 4 months. He had been treated elsewhere as toxoplasma retinochoroiditis and was on oral trimethoprim/sulfamethoxazole, oral azithromycin and oral corticosteroids for the past 3 months without improvement in visual symptoms.

On clinical examination, his best corrected visual acuity was 20/30 in the right eye and 20/20 in the left eye. The intraocular pressure was 14 mmHg in both eyes. The anterior segment of right eye showed fine keratic precipitates and 2 + cells in the anterior

* Corresponding author. Vitreo-Retina & Uveitis Service, LV Prasad Eye Institute, GMR Varalakshmi Campus, Hanumanthuwaka Junction, Visakhapatnam, AP, 530040, India.
E-mail addresses: avinash@lvpei.org (A. Pathengay), drbhavikpanchal@gmail.com (B. Panchal), whiteflint@gmail.com (H. Choudhury), basu@lvpei.org (S. Basu), nxb190@med.miami.edu (N. Relhan), hflynn@med.miami.edu (H.W. Flynn).

http://dx.doi.org/10.1016/j.ajoc.2017.06.001
2451-9936/© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

chamber. View to the posterior segment was hazy with media clarity of grade 2. The left eye examination was unremarkable. A yellowish grey area of chorioretinitis was observed within a clover leaf shaped zone of chorioretinal atrophy in the inferotemporal quadrant (Fig. 1A). The patient had a positive tuberculin skin testing, chest X-ray showed opacities suggestive of tuberculosis and a positive PCR on the vitreous biopsy for *Mycobacterium tuberculosis* DNA. Based on these findings, a diagnosis of IOTB[3] was made.

The patient was started on anti-tubercular therapy (ATT). At 1 month, a short course of oral corticosteroids was given as the patient developed paradoxical worsening with ATT and tapered off over next 4 months. At the last follow-up visit 6 months after completion of ATT, the visual acuity improved to 20/25 with complete resolution of vitritis and chorioretinitis, leaving an area of non-pigmented chorioretinal atrophy (Fig. 1B).

Case 2 - A 45-year-old male presented with gradual painless diminution of vision in his left eye for the last 6 months. His best corrected visual acuity at presentation was 20/400 in the affected eye. The slit lamp biomicroscopy showed 2 + cells in the anterior chamber. Fundus showed vitritis grade 2 along with a whitish area of active chorioretinitis within a circumferential depigmented chorioretinal atrophy in the nasal retina (Fig. 2A). His tubercular skin test was positive with an induration measuring 15 mm and chest X-ray showed granulomas suggestive of tuberculosis. A diagnosis of probable IOTB[3] was made and ATT was started in combination with oral corticosteroids. The ATT was continued for 9 months along with tapering doses of oral corticosteroids over a period of 3 months. The vitritis and chorioretinitis resolved with improvement in visual acuity to 20/20 at last follow-up (Fig. 2B).

Cases 3–6 - The presence of active chorioretinitis within the chorioretinal atrophy was noted in 4 other patients with positive tuberculin skin testing and chest X-Ray consistent with the evidence of tuberculosis. Polymerase chain reaction (PCR) of the vitreous specimen was performed for 4 cases (remaining 2 cases could not afford the diagnostic test), and was positive in 2/4 cases. Personal history and clinical picture were not suggestive of syphilis, thus no serological tests for syphilis were performed. Moreover, presence of active chorioretinitis within the chorioretinal atrophy was present in all 6 cases. All patients were started either on ATT alone or in combination with oral steroids. The ATT was continued for a period of 9 months alone or in combination with oral corticosteroids tapered over 3–4 months. All patients responded well to the treatment, showing complete resolution of the chorioretinitis. The clinical features of all 6 patients are summarized in Table 1.

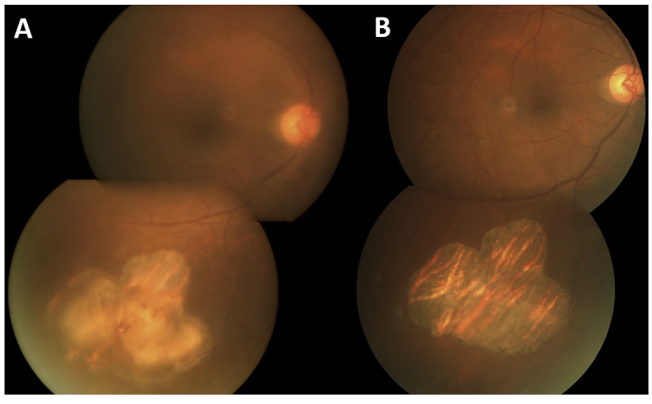

Fig. 1. (A) Fundus photograph of right eye at presentation shows vitritis and an inferotemporal area of active chorioretinitis within a clover leaf shaped zone of depigmented chorioretinal atrophy. The patient was treated with antitubercular treatment for 9 months along with short course of systemic corticosteroids. (B) Fundus photograph of right eye at 15 months follow-up shows complete resolution of chorioretinitis and vitritis with a patch of chorioretinal atrophy.

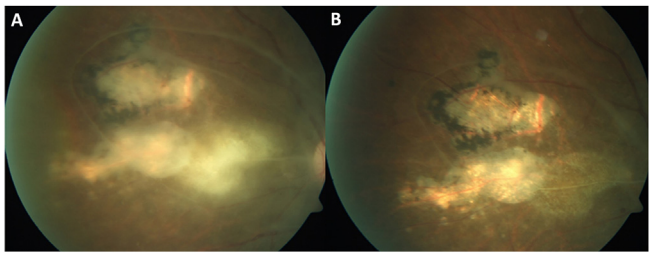

Fig. 2. (A) Fundus photograph of case 2 showing an area of active chorioretinitis within chorioretinal atrophy nasal to the disc at the time of presentation. The patient was treated with antitubercular treatment for 9 months. (B) Fundus photograph shows complete resolution of chorioretinitis with healed patch of chorioretinal atrophy.

3. Discussion

The location of active chorioretinitis within pre-existing chorioretinal atrophy in cases of posterior uveitis may provide an important clue to the etiology. Chorioretinitis adjacent to an area of pigmented and/or atrophic scar has been well documented in toxoplasma retinochoroiditis.[4] The toxoplasma cysts remain dormant at the edge of the scar and on reactivation the organism undergoes multiplication giving rise to this typical clinical picture.[4] However, presence of retinitis within the chorioretinal atrophy may indicate a different etiology other than toxoplasmosis.

Posterior segment manifestations of IOTB may have varied presentations including choroidal tubercle, choroidal tuberculoma, subretinal abscess, serpiginous-like choroiditis, retinitis and retinal vasculitis, neuroretinitis, optic neuropathy, endophthalmitis and panophthalmitis.[5] Several clinical signs too have been described viz. broad-based posterior synechiae, retinal vasculitis with or without choroiditis, and serpiginous-like choroiditis[2] in patients with latent or manifest tuberculosis in tuberculosis-endemic areas to arrive at a more specific diagnosis. However, no clinical sign or investigation has proved to be a gold standard in the diagnosis of IOTB.

The current series introduces a unique observation which may assist in making the clinical diagnosis of IOTB, which along with the other corroborative signs would enhance the pretest probability of a positive result from the subsequent investigations.

This novel clinical sign of active chorioretinitis within the chorioretinal atrophy, seen in these cases of IOTB can be explained if the pathophysiology of tuberculosis infection and the structure of a tuberculosis granuloma are considered. Dendritic cells when infected by mycobacteria stimulate CD4 and CD8 T cells, which in turn activate infected macrophages. The mycobacteria however resist lysosomal destruction and cause persistent infection leading to chronic antigenic stimulation and T-cell accumulation around macrophages. Macrophages later differentiate into epithelioid cells and may fuse to form giant cells. A granuloma thus results wherein there exists a balance between mycobacterial killing and survival.[6] Fibrosis or even calcification surrounding the granuloma can develop in long standing cases. Upon reactivation, the mycobacteria present within the granuloma multiply and the body is unable to contain the overwhelming infection, which in posterior segment of the eye may present as reactivation of chorioretinitis within the scar.

The novel clinical sign is applicable to all patients presenting with a focal chorioretinitis lesion in a TB-endemic country, where the etiological diagnosis remains inconclusive from the laboratory and radiological investigations. Incidentally, the disease

Table 1
Clinical profile of patients with active retinitis within an area of chorioretinal atrophy.

Patient No.	Age (years)/Sex	Eye	Polymerase Chain Reaction Results	Mantoux Test Results (mm)	Anterior Segment Inflammation	Vitritis	Other ocular signs corroborative of intraocular TB	Initial Visual Activity	Treatment	Final Visual Activity	Follow-up (Months)
1	51/M	OD	+	14	KP's, cells 2+	+	Snow ball opacities adjacent to the CRA	20/30, N6	ATT followed by CS	20/25, N6	25
2	45/M	OS	ND	15	cells 1+	+	Subvascular pigmentation	20/400, N24	ATT+CS	20/20, N6	15
3	55/M	OS	–	45	cells 1+	+	Subvascular pigmentation, MFC	20/200, N12	ATT alone	20/50, N9	9
4	39/F	OS	ND	30	quiet	+	NSD, choriditis	20/100, N36	ATT followed by CS	20/20, N6	20
5	22/M	OD	–	10	quiet	+	NSD, MFC, Vasculitis	20/400, N36	ATT followed by CS	20/60, N18	10
6	26/M	OD	+	18	KP's, cells 2+	+	Subvascular pigmentation, MFC	20/25, N6	ATT alone	20/20, N6	39

ATT-anti tuberculous treatment, CRA-chorioretinal atrophy, CS-corticosteroids, KP-keratic precipitates, MFC-multifocal choroiditis, ND-not done, NSD-neurosensory detachment, OD-right eye, OS-left eye, TB-tuberculosis.

progression is different in multifocal serpiginous choroiditis, a well-recognized form of IOTB, in which activity is always seen at the periphery of pre-existing lesions. This reflects the complexity in the immunepathogenesis of IOTB.

4. Conclusion

Active chorioretinitis within the chorioretinal atrophy may be an important clinical sign in the early diagnosis of intraocular tuberculosis.

Patient consent

The patients consented to publication of the case in writing.

Acknowledgements/disclosures

Funding/support

No funding or grant support.

Conflict of interest

The following authors have no financial disclosures: AP, BP, HC, SB, NR, HWF.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Author contributions

Conception and Design of the study (AP, BP, HC, SB, NR, HWF), collection and management (AP, BP, HC, SB), analysis, interpretation of the data, manuscript preparation, review and final approval (AP, BP, HC, SB, NR, HWF).

Other acknowledgements

None.

References

1. Tuberculosis Tabbara KF. *Curr Opin Ophthalmol*. 2007;18:493–501.
2. Gupta A, Bansal R, Gupta V, Sharma A, Bambery P. Ocular signs predictive of tubercular uveitis. *Am J Ophthalmol*. 2010;149:562–570.
3. Gupta A, Sharma A, Bansal R, Sharma K. Classification of intraocular tuberculosis. *Ocul Immunol Inflamm*. 2015;23:7–13.
4. Delair E, Latkany P, Noble AG, Rabiah P, McLeod R, Brezin A. Clinical manifestations of ocular toxoplasmosis. *Ocul Immunol Inflamm*. 2011;19:91–102.
5. Gupta V, Gupta A, Rao NA. Intraocular tuberculosis—an update. *Surv Ophthalmol*. 2007;52:561–587.
6. Saunders BM, Britton WJ. Life and death in the granuloma: immunopathology of tuberculosis. *Immunol Cell Biol*. 2007;85:103–111.