Photo Essay

Successful Management of Proliferative Diabetic Retinopathy and Multiple Choroidal Tubercles in a Patient with Miliary Tuberculosis

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PRESENTATION

A 30-year-old man who was recently diagnosed as having diabetes presented with symptoms of weight loss, fever, and cough persisting for 2 months. A computed tomogram of his chest revealed multiple, diffuse, miliary, nodular lung opacities, and a transbronchial lung biopsy revealed caseating granulomas. With the diagnosis of miliary tuberculosis, he was started on anti-tubercular therapy (ATT). After a week of initiation of treatment, he was evaluated for the mild blurring of vision. He had a visual acuity of 20/30 in the right eye (RE) and 20/20 in the left eye (LE). He showed multiple reddish-orange choroidal lesions at the posterior pole bilaterally with indistinct margins, 1/3 to 1 disc diameter in size (choroidal tubercles), intraretinal hemorrhages, cotton wool spots, radially oriented macular hard exudates, and neovascularization of the disc (NVD) and elsewhere in the retina (NVE). The right eye showed a superotemporal tubercle with overlying NVE [Figure 1a], while the left eye showed NVEs over nasal and inferonasal tuberculomata [Figure 1b]. Fluorescein angiography (FA) revealed macular leakage and leakage from NVD and NVE in both eyes [Figure 1c]. The choroidal tubercles showed early hypofluorescence and late hyperfluorescence. Cystoid spaces were noted in both maculae (Figure 1d). In view of the proliferative diabetic retinopathy (PDR) and macular edema, he received bilateral intravitreal bevacizumab followed by panretinal photocoagulation. At 6 months post-procedure, the choroidal tubercles and NVD/NVE showed regression [Figure 2]. The ATT was continued for 1 year and the final visual acuity was 20/30 and 20/20 in the right and left eye, respectively. Miliary tuberculosis responded to ATT and diabetes was under control.

DISCUSSION

Though approximately 15% of tuberculosis cases are attributable to diabetes[1], the coexistence of PDR and choroidal tubercles has not been previously reported. Choroidal tubercles can be seen in up to 38.4% of miliary and meningeal tuberculosis cases.[2] The morphology of the choroidal lesions seen in our case was typical of choroidal tubercles. We observed neovascularization over some choroidal tubercles; these regressed along with the overlying neovascularization following treatment.

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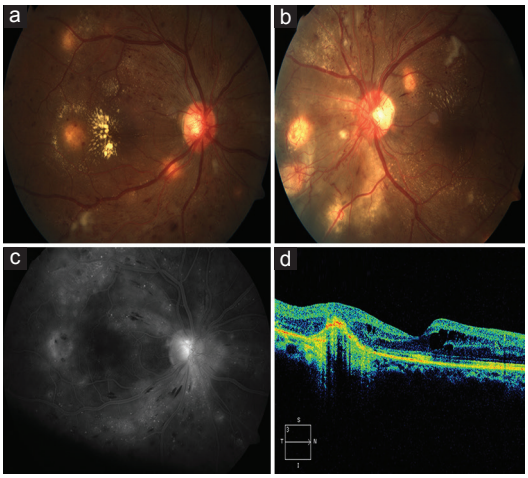

Figure 1. Fundus photograph of the right (a) and left (b) eyes showing multiple tubercles, multiple hemorrhages, hard exudates, and multiple areas of neovascularization. (c) Late-phase fluorescein angiogram of the right eye showing mild diffuse leak at the macula, hyperfluorescence of the temporal tubercle, neovascularization of the disc, and superotemporal small neovascularization elsewhere over a small tubercle. (d) Optical coherence tomogram of the right eye showing cystic spaces at the macula, and a dome-shaped elevation of retinal pigment epithelium with underlying heterogenous reflectivity.

Retinal or optic disc neovascularization can occur in inflammatory diseases of the posterior segment without the presence of capillary non-perfusion.[3] However, our patient had peripheral retinal capillary non-perfusion areas on FA and other signs of PDR. Exudation from choroidal tubercles may have caused the radial macular hard exudates. The patient's blood pressure was normal.

In guinea-pig models of tuberculosis, hypoxia and increased VEGF expression have been demonstrated within the choroidal granuloma by Thayil and colleagues.[4] Bansal and co-authors reported a 43-year-old woman with choroidal tuberculoma and surrounding subretinal exudation despite ATT and systemic steroids, who responded dramatically to bevacizumab.[5] The authors have previously shown that intravitreal bevacizumab acts dramatically against the choroidal neovascular membrane in choroidal tuberculoma.[6,7] VEGF is a common factor in the pathogenesis of PDR and diabetic macular edema,[8] and may also have a role to play in choroidal tuberculosis.[4,5] Increased expression of VEGF by the tubercular granuloma may have resulted in early neovascularization over the tuberculomata, increased the severity of PDR, and might also have caused the PDR to set in early in our young patient who was only recently diagnosed as having diabetes. Anti-VEGF agents may thus have an important role in such conditions.

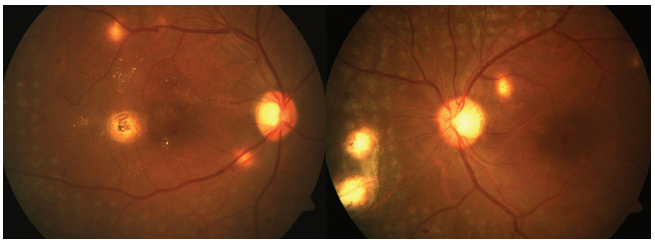

Figure 2. Fundus photographs taken six months after the presentation to ophthalmology department showing regressed tuberculomata and neovascularization in both eyes. Laser marks of pan-retinal photocoagulation are also visible.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of Interest

There are no conflicts of interest.

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