Photo Essay

Multimodal Imaging after Electric Shock Retinopathy

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PRESENTATION

A 29-year-old male patient presented with decreased vision for 2 years following electrocution injury (electric cables with 25000 volts). No significant family or ocular history was elicited. He was diagnosed to have pigmentary retinopathy in both eyes clinically.

Best corrected visual acuity (BCVA) was 6/12, N8 in the right eye and 6/18, N8 in the left eye. Anterior segment examination revealed early posterior subcapsular lens opacities. Fundus examination [Figure 1] showed optic disc pallor, presence of chorioretinal atrophy surrounding the optic nerve, with localized pigment stippling about 4 disc areas temporal to the fovea. Mild retinal vascular attenuation was noted bilaterally. No inflammatory reaction in the anterior chamber or vitreous was noted. Fundus autofluorescence imaging [Figure 2] showed bilateral increased autofluorescence surrounded by a ring of reduced autofluorescence in the peripapillary region indicating RPE atrophy. Visual field analysis revealed corresponding nasal defects in both eyes. Fundus fluorescein angiography (FFA) [Figure 3] showed early hypofluorescence and late hyperfluorescence

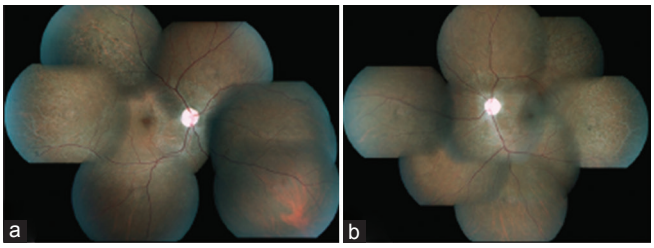

Figure 1. Colour fundus photographs of the right (a) and the left (b) eyes respectively showing peripapillary pigmentary changes, pale optic disc, pigmentary stippling in the temporal region and generalized vascular attenuation in both eyes.

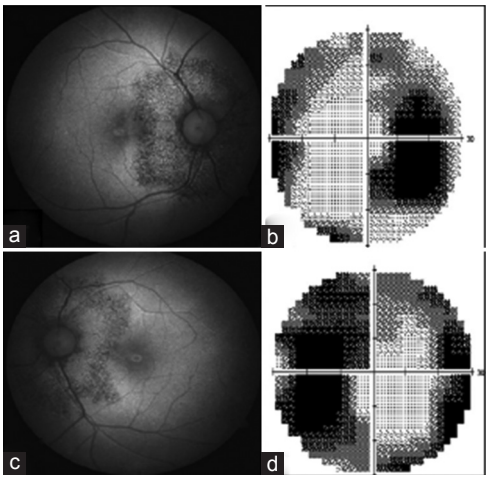

Figure 2. Fundus autofluorescence images of the right (a) and the left (c) eyes respectively showing a peripapillary region of increased autofluorescence surrounded by a ring of reduced autofluorescence. The corresponding binasal visual field defects are shown (right, b and left, d).

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around the disc and the temporal fundus, indicating transmission window defects. Optical coherence tomography (OCT) [Figure 4] showed thinning in the outer retinal layers nasal to the macula, disrupted IS/OS junction and reduced central subfield thickness. Full field electroretinogram [Figure 5] showed delayed and reduced amplitudes of scotopic and photopic responses in both eyes.

DISCUSSION

The patient had a history of shock with electric cables 2 years prior to presentation to us. We diagnosed him as having electric shock retinopathy and ruled out other hereditary or inflammatory conditions based on history and examination findings. We discuss the late retinal manifestations of electrocution injury may be myriad and non-specific.[1,2] Caused by thermal coagulative necrosis, these changes are mainly seen surrounding the optic nerve and in the retinal periphery.[3] The initial retinal whitening seen in acute injury due to thermal damage usually progresses to retinal pigment epithelium (RPE) atrophy as a late manifestation.[4,5] Late optic atrophy and retinal vascular damage may occur. Differentiation from the other causes with similar clinical pattern needs a thorough history and clinical evaluation. This case illustrates the typical findings of electrocution retinopathy both clinically, and with various imaging modalities. Since the main differentials

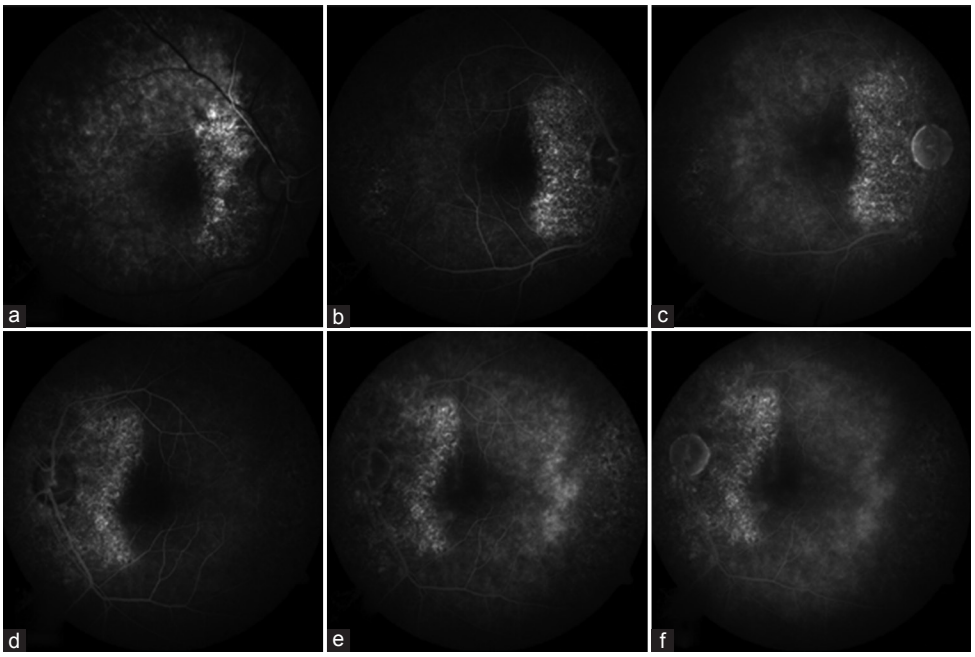

Figure 3. Fundus fluorescein angiogram of both eyes (early phase, a and d; mid phase, b and e; late phase, c and f, right and left eyes, respectively) showing normal dye transit times and transmission defects surrounding the optic disc and temporal retina.

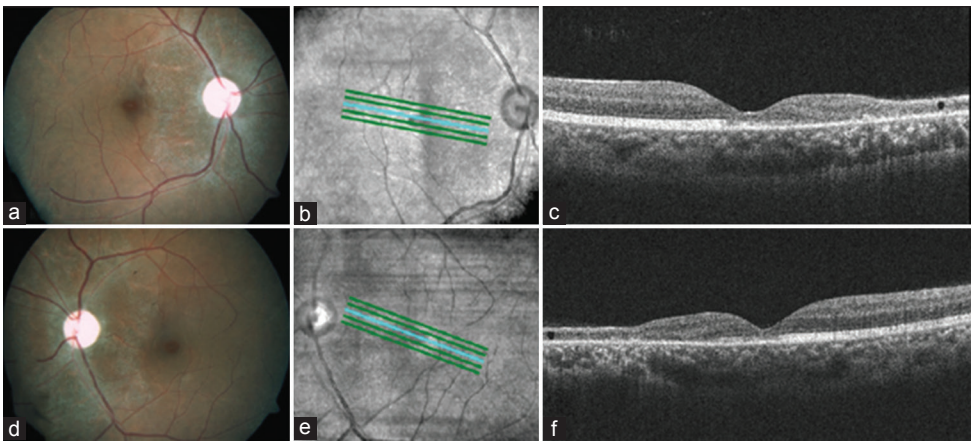

Figure 4. The posterior pole photograph and red free images of the right (a and b) and left (d and e) eyes, respectively. The corresponding OCT images (c, right eye; f, left eye) show reduced central foveal thickness, disrupted IS/OS junction and retinal thinning in outer retinal layers nasal to the macula.

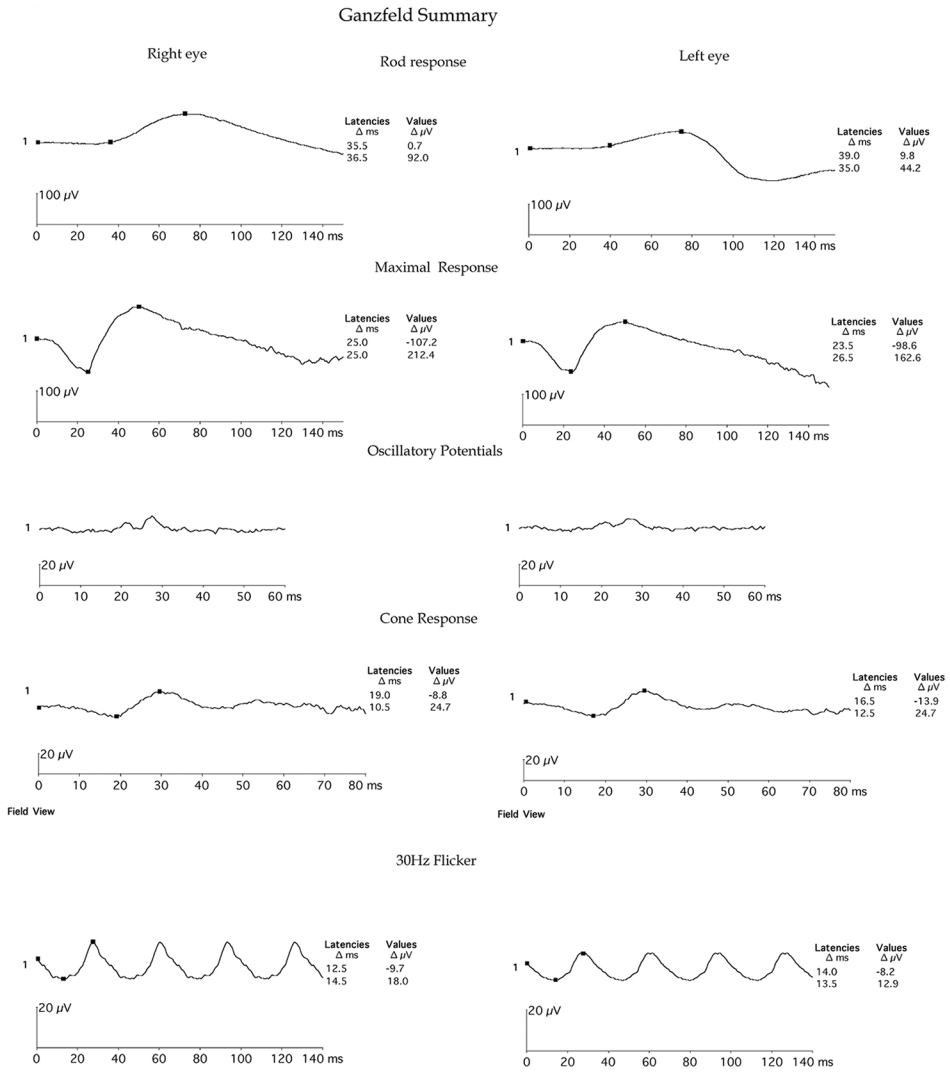

Figure 5. Full field electroretinogram showing delayed and reduced amplitudes of both scotopic and photopic responses in both eyes.

are hereditary and inflammatory retinopathies, taking a detailed history regarding symptoms of night/color blindness in the patient's family or presence of consanguinity is essential. Moreover, RPE degeneration may involve a larger area up to the mid-peripheral fundus. Fundus autofluorescence and OCT show the corresponding defects (generalized outer retinal thinning with indistinct edges, as seen in the present case). Differentiation of this condition from other entities based on electroretinography (ERG) alone may be difficult. Based on our clinical experience, inflammatory retinopathies usually present with inflammatory reaction in the anterior chamber and vitreous, a greater extent of retinal involvement, vascular changes such as sheathing, larger chorioretinal atrophic patches with patterns of RPE atrophy mixed with hypertrophy, and recurrent episodes with poorer vision. OCT may be normal, or show chronic cystoid changes or central thinning depending upon the stage of the disease.

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Conflicts of Interest

There are no conflicts of interest.

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