Bilateral Cataract Following Electrical Injury

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Electrical injuries can result in a wide range of ocular complications. Of these, electrical cataract can occur after a latent period and then progress with startling rapidity. However proper surgical management can result in good and stable visual acuity as is seen in this case.

Case Report

A case of bilateral cataract which developed following electrocution injury in which there was rapid progression of the cataract in the left eye, its clinical history, surgical management and outcome is reported.

A 35 year old electrician reported to our outpatient department two months following electric injury – high tension wire (11,000 Volt) falling on his head, with redness in the left eye of one week duration. On examination, there was a sagittal linear deep raw area on the scalp and on both soles, with superficial burns on the face including periorcular area (Fig 1 and Fig. 2).

The best corrected visual acuity was 6/6, N 6 right eye and 6/12, N 12 in the left eye. Slit lamp examination showed anterior subcapsular cataractous changes in both eyes with anterior uveitis in the left eye (Fig. 3a & b). Fundii in both eyes were within normal limits. He was started on topical steroids and cycloplegics with which uveitis was controlled and vision in the left eye improved to 6/6 by three weeks. However, over one
week, his vision in the left eye deteriorated to counting fingers at one metre. On examination, right eye remained status quo while left eye showed an intumescent cataract with phacomorphic glaucoma (Fig. 4). Appropriate antiglaucoma medications were instituted and IOP was brought down to normal range.

He was scheduled for temporal clear corneal phacoemulsification with foldable PCIOL implantation under peribulbar anesthesia after controlling the IOP and intraocular inflammation. Ocular hypotony was achieved with digital massage. The anterior capsule was stained with trypan blue. Intraoperatively, the anterior chamber was very shallow, the anterior capsule of the cataract was convex with underlying fluid clefts. An attempt was made to decompress the capsular bag by aspiration of fluid cortex after a direct puncture with a 26 G needle. Since significant decompression could not be obtained with single needle puncture, cortical material was removed by bimanual I/A taking care to maintain the anterior chamber depth throughout the procedure. Capsulorhexis was continued with Utrata forceps under 1.4% sodium hyaluronate. The soft lens matter was aspirated with the phaco needle. A hydrophylic acrylic PCIOL was implanted in the capsular bag.

Postoperatively, there was mild anterior chamber reaction. The intraocular lens was well centred (Fig. 5) and fundus examination was normal (Fig. 6).

On review two weeks later, the PCIOL continued to be well centred with a best corrected visual acuity of 6/6, N6 in left eye. However right eye showed signs of uveitis with progression of the anterior subcapsular cataract. Vision had come down to 6/12, N8 in that eye. The uveitis was brought under control with topical steroids and the patient was kept on a maintenance dose of topical steroids. On review two months later, vision had further come down to 6/18, N12, with further progression of cataract in right eye. The IOP was raised to 48 mm of Hg and the angle was open on gonioscopy. He has been started on topical antiglaucoma medications with which IOP is well controlled and he is awaiting cataract surgery.

**Discussion**

Electrical cataracts may occur following contact with high tension conductor, lightning or electric shock therapy. Only few cases of electric cataract have been reported in the literature probably because few patients...
Fig. 7. Progression of cataract in right eye on review 2 months later

survive the high voltage of current that induces cataract formation. Cataract usually occurs 1-12 months after the accident and is frequently associated with no other observable ocular damage. An incidence of 6.2% of cataracts is seen following electrical injury. However the degree of lenticular change seems to bear no definite relation to the strength of the current. In most cases, the electric current has passed through the head in the vicinity of the eye with a contact electrical burn. Entrance and exit wounds are seen. It is found that the young lens is more liable to damage than the sclerosed lens of age. The exact pathogenesis of cataract development is unknown. Direct coagulation of lens proteins and the osmotic changes following damage to the subcapsular epithelium are thought to be responsible. Scale like grey opacities may form in the capsule and more characteristically in the subcapsular layers of the cortex, usually the anterior cortex, though posterior cortex may also be affected. The clinical course of the cataract varies. Regression may occasionally occur, they may remain stationary, or maturation may occur slowly over an average period of 6 months. Sometimes with startling rapidity after a long static period, the cataract may mature to complete milkiness resembling hammered silver or mother of pearl. The cataract may become intumescent and as a rarity cause acute angle closure glaucoma as it swells, as in this case.

A typical electric burn may occur at the point of contact leaving its imprint as a sharply defined necrotic mark without surrounding hyperemia. A similar exit wound may be seen. Other lesions affecting the eye are conjunctival hyperemia, interstitial corneal opacities, uveitis which may be mild or severe, miosis, spasm of accommodation etc. Electric energy can damage lens, retina and choroid. Optic nerve coagulation, necrosis of retina, choroid and optic atrophy have been reported. Retinal oedema, papillodeuma and haemorrhages with patches of chorio-retinal atrophy in the periphery, rupture of choroid, optic neuritis or even retinal detachment may occur. Macular oedema may lead to development of macular cysts or holes. Pareses of extraocular muscles have been frequently observed.

In the given patient typical entrance and exit wounds could be seen. Except for the anterior uveitis and cataract, the eyes had otherwise not been damaged. Following the episode of uveitis, the cataract in one eye was found to progress rapidly over a week leading to an intumescent cataract with phacomorphic glaucoma. However phacoemulsification followed by posterior chamber intraocular lens implantation in the bag resulted in stable and good visual acuity. Thus, proper surgical management of electric cataract will result in a good visual rehabilitation if the eye has otherwise escaped damage as in this case.

References