

Bilateral electric cataract: A rare case report

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Abstract

Electrical insults to the human body range from death to damage to various parts of the body. It can result in a wide range of ocular injuries with resultant ocular complications. Of these, electrical cataract can occur after a latent period and then can progress with starting rapidly. The clinical picture of electrical injury is influenced by numerous factors including voltage, tissue sensitivity, type of current (direct or alternating), length of contact, place and area of contact, and route traveled in the body. The majority of cases respond well to surgery, but final visual acuity will depend on the other ocular damage due to electrical current. However proper surgical management can result in good and stable visual acuity as is seen in this case. The need for awareness of the possibility of this complication and screening of all cases of electrical injuries is stressed. The majority of cases respond well to surgery. We report a rare case of a 15 years young boy having bilateral anterior sub-capsular cataracts caused by high-voltage electrocution in a young man who regained normal vision after surgery in both eyes. Bilateral Phacoemulsification with foldable hydrophobic lens [PCIOL] in capsular bag was done.

Keywords: Electrical cataract, Anterior sub-capsular cataracts, Phacoemulsification

Case Report

We report a rare case of a 15 years young boy with history of sudden painless diminution of vision both eye (left eye >right eye), for 40 days after the electric injury with an overhead high tension railway electric cable while playing.

On examination his best corrected visual acuity on initial visit was right eye finger count at 3 meter distance and hand movement at 2 feet distance in left eye perception of light and projection of rays was accurate in all four quadrants. Rest anterior segment findings was within normal limit in both eye. Pupil of both eye normal reacting to the light Stellate shaped anterior sub-capsular lens opacity was seen in both eye.

Entry wound of size 6 × 1 cm present over parietal bone posteriorly in a coronal plane .wound of exit present over right little finger, which was amputated.

Fundus examination: In right eye faint red glow was seen on distant direct ophthalmoscopy and media was hazy due to cataractous changes. Disc focused with -3, C:D was 0.3:1; blood vessels and peripheral retina was within normal limit. In left eye fundal glow was not seen.

Both eye Phacoemulsification with foldable hydrophobic lens [PCIOL] in capsular bag was done. The procedure was the same in both eyes: Clear corneal incisions were made at 10 o'clock and 2 o'clock. Diluted adrenalin and atropine (1:10 000) were injected into the anterior chamber. The anterior capsule was stained with trypan blue. Acohesive ophthalmic viscosurgical device (sodium hualuronate 1% [Healon]). A continuous curvilinear capsulorhexis done. After phacoemulsification and IOL implantation in the capsular bag, the incision was sealed with stromal hydration. Subconjunctival betamethasone 4 mg and gentamicin 20mg were injected, and the eye was

patched. Intraoperative and postoperative course were uneventful. His best corrected visual acuity after 8 days of operation was [RE]-6/12 which improves to 6/6 with pin hole and [LE] -6/9 PH →6/6, Postoperative fundus examination reveals normal posterior segment findings.

Discussion

The incidence of cataract reported in patients with electrical injuries varies from 0.7% to 8.0%. This is probably due to differences in the voltage and duration of action of the current, the distance of the area of contact from the eye, the extent of the surface contact, and the direction taken by the current in the body. The strength of electrical current causing cataract formation varies from 220 to 80 000 volts.

The cataract may develop immediately after injury or be delayed a few days; the latency varies from 1 to 18 months, although a latent period of 11 years has also been reported.⁸ If the point of contact is on one side and the lens changes are bilateral, the cataract initially forms in the eye on the affected side (closest to the contact point) and later in the contralateral eye. The interval between cataracts occurring in the 2 eyes can vary from 3 weeks to 2 years. High voltage electric burns can cause various ocular injuries and may manifest in the form of conjunctival hyperemia, corneal opacities, uveitis, miosis, spasm of accommodation, cataract, retinal edema, papilloedema, chorio-retinal necrosis/atrophy, retinal detachment and optic atrophy. Choroidal rupture, optic neuritis and retinal detachment may also be seen. Macular edema may progress to macular cysts or holes.

In most cases, the current passes through the head in the vicinity of the eye and a contact electrical burn develops. In our case, the current passed through the head and the patient developed electrical burns on his

scalp. Such findings have been reported in 2% of cases of burns due to electricity.

The earliest changes seen in the lens after electrical injury are a collection of multiple fine vacuoles beneath the anterior capsule, usually in the midperiphery of the lens, requiring dilation of the pupil for visualization. These collections are always present in the anterior subcapsular area and show no apparent relationship to lens fiber configuration. Over intervals varying from weeks to months, these vacuoles are replaced with flake-like opacities that coalesce and migrate into the line of vision. Electrical burn can cause scar formation in the anterior capsule, leading to impairment of lens nutrition and, eventually, cataract formation.

Industrial electrical accidents generally affect the anterior subcapsular cortex, while lightning injuries affect anterior and posterior subcapsular areas. Clinically, there is a general tendency toward progression but occasionally the cataract remains stationary for as long as 2 years.

The exact pathogenesis of electric cataract is controversial, and several theories have been put forward.

Decreased permeability of the lens capsule, a direct coagulative effect on the proteins of the lens cells, powerful contraction of the ciliary muscle causing a concussion type of cataract due to mechanical damage, nutritional disturbance of the lens due to iritis and impaired circulation, or ultraviolet and infrared irradiation could be causative factors in electric cataract. The present day cataract surgery of phacoemulsification followed by foldable in the bag implantation of posterior chamber intraocular lens resulted in stable and good visual acuity in this case. Thus, proper surgical management of electric cataract will result in a good visual rehabilitation if the eye has no additional damage as in this case.

In conclusion, electrical injuries can cause bilateral intumescent cataracts. Outcomes after cataract surgery are excellent if fundus and optic nerve examinations are normal.

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