

# Rhegmatogenous retinal detachment following electrical shock injury

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**Dear Editor,**

We present a case of "Rhegmatogenous retinal detachment following electrical shock injury" for evaluation for publication in your journal. To our knowledge, this is the first case of retinal tears and retinal detachment caused by an electrical shock reported in the literature. That is why we think this submission could be interesting for you and your readership.

Ocular complications from electrical injuries are uncommon but can present with various disorders affecting different tissues of the eye, such as extraocular muscles, cornea, iris, lens, retina, choroid and optic nerve<sup>[1]</sup>. Although the extent of the damage depends primarily on the intensity of the electric current, several factors including the entrance and exit sites of the current and its tract, the tissue's resistance to the current and duration of exposure contribute to the pathology<sup>[2]</sup>. We report a case of retinal detachment with two retinal tears following an electrical shock injury.

A 48-year-old man sustained a 380-volt electrical injury to the right side of his body, including the hand, arm and shoulder following an accidental contact with a wire in the workplace. He did not experience a loss of consciousness at the scene of accident and no severe skin burns occurred. He was discharged from the emergency care unit following an overnight observation without any major therapeutic intervention. Four days after the accident, the patient admitted to an ophthalmology clinic with complaints of vision loss and flashing lights in his right eye. He was then referred with a diagnosis of retinal detachment.

On admission to our clinic one week after the electrical injury, his best-corrected visual acuity was 20/400 OD and

20/20 OS. The examination of extraocular structures and anterior segment was unremarkable. Intraocular pressure was normal in both eyes. Fundus examination of the right eye revealed a 5 clock hours superior retinal detachment extending beyond superior vascular arcades without involving the fovea. A detailed examination with a wide angle fundus contact lens revealed two large retinal tears, reciprocally located at 1 o'clock and 7 o'clock in the mid-periphery, just behind the equator. The central vitreous was clear with minimal amount of pigment dispersion. Fundus examination of the other eye was unremarkable (Figure 1).

Pars plana vitrectomy (PPV) was applied the next day. Posterior vitreous was found detached and cortical vitreous near both retinal tears was condensed in a fibrillary fashion. Following complete removal of the vitreous gel and complete reattachment of the retina, endolaser photocoagulation was applied around retinal tears. Silicone oil was used for tamponade. Three months after the operation, the silicone oil was removed. The patient's best-corrected visual acuity was 20/40 OD and 20/20 OS in the last control visit. The retina was reattached without any additional problems (Figure 2). Retinal disorders that can occur following an electrical shock injury include macular cysts, macular edema, macular hole, retinal pigment epithelial changes, retinal vascular occlusions, retinal detachment, abnormal electrophysiological tests and coagulative necrosis of the choroidal and retinal vessels<sup>[2-5]</sup>. Although retinal detachment is mentioned among possible consequences of electrical injuries, our literature search did not reveal a report of retinal tear or retinal detachment secondary to electrical shock. Only a case of retinal necrosis and detachment subsequent to a PPV for macular hole caused by electrical injury was reported by Rajagopal *et al*<sup>[4]</sup>.

A possible mechanism for the formation of retinal tears and subsequent development of retinal detachment are concussive forces of the electrical shock which leads to incomplete vitreous detachment and vitreoretinal traction. In addition, thermal shrinkage of the vitreous following an electrical injury could exert less abrupt, but more prominent traction over the retina. Focal or generalized ischemia of the retina or the choroid, as well as focal or generalized thermal injuries to these structures could also trigger processes leading to exudative or rhegmatogenous retinal detachments.

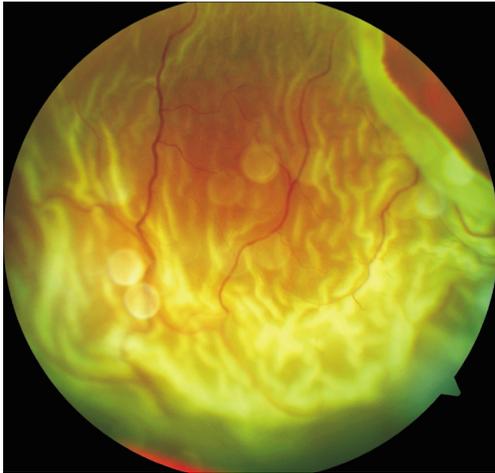


Figure 1 Preoperative fundus photograph of the eye showing the superior retinal detachment and the hole at 1 o'clock.



Figure 2 Postoperative fundus photograph of the eye showing the localization of both retinal holes.

In our case, loss of vision occurred on the fourth day following the injury and retinal tears and detachment were diagnosed on the same day. Two large breaks were localized

almost 180 degrees apart and no additional retinal pathology predisposing to their formation was present. The patient had no visual complaints such as floaters and flashes before the injury. These findings make the presence of an asymptomatic retinal pathology prior to the injury unlikely. As the voltage of the electric current (380-volt) and the degree of concomitant bodily injuries were relatively low, findings of thermal or ischemic damage to retina or its adjacent structures were not observed in our case. Instead, vitreoretinal traction forces generated by the concussion caused by the electrical shock seems to be a more logical explanation for the formation of retinal breaks and detachment.

In summary, we report a case of retinal detachment with two large retinal tears secondary to a relatively low voltage electrical shock injury, which is successfully treated with pars plana vitrectomy. To our knowledge, this is the first case of retinal tears and retinal detachment caused by an electrical shock reported in the literature.

**REFERENCES**

- 1 Miller BK, Goldstein MH, Monshizadeh R, Tabandeh H, Bhatti MT. Ocular manifestations of electrical injury: a case report and review of the literature. *CLAOJ* 2002;28(4):224–227
- 2 Grover S, Goodwin J. Lightning and electrical injuries: neuro-ophthalmologic aspects. *Semin Neurol* 1995;15(4):335–341
- 3 Sony P, Venkatesh P, Tewari HK, Garg SP. Bilateral macular cysts following electric burn. *Clin Experiment Ophthalmol* 2005;33(1):78–80
- 4 Rajagopal J, Shetty SB, Kamath AG, Kamath GG. Macular hole following electrical shock injury. *Can J Ophthalmol* 2010;45(2):187–188
- 5 Boozalis GT, Purdue GF, Hunt JL, McCulley JP. Ocular changes from electrical burn injuries. A literature review and report of cases. *J Burn Care Rehabil* 1991;12(5):458–462