
Rhegmatogenous retinal detachment and full-thickness macular hole induced by lightning

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Abstract

A 31-year-old gentleman was remotely struck by lightning and complained of blurred vision in his left eye. He was diagnosed with left eye anterior uveitis and full-thickness macular hole (FTMH), and subsequently referred for vitreoretinal intervention. On examination, his left-eye vision was hand movement. Anterior uveitis had resolved with no cells in the anterior chamber. Posterior subcapsular cataract 2+ was noted. There was a FTMH and partial posterior vitreous detachment (PVD) confirmed by optical coherence tomography (OCT). Right eye was normal with 6/6 vision. At one-month follow-up, the macular hole was closed spontaneously but localised rhegmatogenous retinal detachment (RRD) was noted in the inferior retina with macula-on. There were multiple holes in the inferior equatorial region surrounded by hyper- and hypopigmented retinal atrophy. The patient underwent phacoemulsification, intraocular lens implantation, vitrectomy, and gas tamponade (C3F8 14%). At one week postoperative, he had recurrent retinal detachment with multiple new atrophic holes noted. He underwent a second vitrectomy with silicone oil tamponade. Best-corrected visual acuity (BCVA) in his left eye two months after surgery was 6/45 and the retina had reattached.

Keywords: full-thickness macular hole (FTMH), lightning strike, retinal atrophy, rhegmatogenous retinal detachment (RRD)

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Lekang retina rhegmatogen dan lubang makular penuh yang disebabkan oleh kilat

Abstrak

Seorang lelaki berusia 31 tahun telah dipanah kilat dan mengadu penglihatan kabur di mata kirinya. Dia didiagnosis dengan uveitis anterior mata kiri dan lubang makular tebal penuh (FTMH), dan kemudiannya dirujuk untuk intervensi vitreoretinal. Semasa pemeriksaan, penglihatan mata kirinya adalah pergerakan tangan. Uveitis anterior telah pulih dengan tiada sel di ruang anterior. Katarak subkapsular posterior 2 + telah diperhatikan. Terdapat FTMH dan lekang vitreous posterior separa (PVD) yang disahkan oleh tomografi koheren optik (OCT). Mata kanan adalah normal dengan penglihatan 6/6. Pada satu bulan susulan, lubang makula telah ditutup secara spontan tetapi retina retina (RRD) rhegmatogenous tempatan telah diperhatikan berlaku di retina inferior dengan macula masih normal. Terdapat banyak lubang di rantau ekuator yang dikelilingi oleh atrophy retina jenis hipopigmen dan hypopigmented. Pesakit menjalani fakoemulsifikasi, implan kanta intraokular, vitrektomi, dan gas tamponade (C3F8 14%). Pada satu minggu pasca pembedahan, beliau mengalami lekang retina yang berulang dengan beberapa lubang atrophik baru yang ditemui. Dia menjalani vitrektomi kedua dengan tamponade minyak silikon. Ketajaman visual yang terbaik dengan bantuan (BCVA) di mata kirinya dua bulan selepas pembedahan adalah 6/45 dan retina telah berjaya dilekatkan.

Kata kunci: atrofi retina, lekang retina rhegmatogen, lubang makmal tebal penuh, mogok kilat

Introduction

We report a rare case of lightning strike survivor with multiple ocular manifestations including posterior subcapsular cataract, uveitis, full-thickness macular hole (FTMH), and rhegmatogenous retinal detachment (RRD). Treatment outcomes are also reported and treatment modality is suggested based on our experience of managing this case.

Case report

A 31-year-old gentleman was remotely struck by lightning and presented to the eye clinic after 1 month complained of pain, redness and progressive blurring of vision

in his left eye. He was diagnosed with anterior uveitis and FTMH in his left eye (Fig. 1), treated with guttae dexamethasone 0.1% (Alcon, Couvreur, Belgium), and was subsequently referred to our centre for vitreoretinal intervention. On examination, vision in his left eye was hand movement. Anterior uveitis had resolved with no cells in the anterior chamber. Posterior subcapsular cataract 2+ was noted. There was a FTMH and partial posterior vitreous detachment (PVD) confirmed by optical coherence tomography (OCT) (Fig. 2). Right-eye vision was 6/6 and normal. At one-month follow-up, the macular hole was closed spontaneously (Figs.3 and 4). However, localised rhegmatogenous retinal detachment (RRD) was noted in the inferior retina with macula-on (Fig. 4). There were multiple holes in the inferior equatorial region surrounded by hyper- and hypo-pigmented retinal atrophy (Fig.5). The patient underwent phacoemulsification, intraocular lens implantation, vitrectomy, laser photocoagulation, and gas tamponade (C3F8 14%). At one week postoperative, he had recurrent retinal detachment at the same location with multiple new atrophic holes. He underwent a second vitrectomy with silicone oil tamponade. Best-corrected visual acuity (BCVA) in his left eye at two months postoperative was 6/45 and the retina had reattached.



Fig. 1. Fundus photo of the left eye showing FTMH.

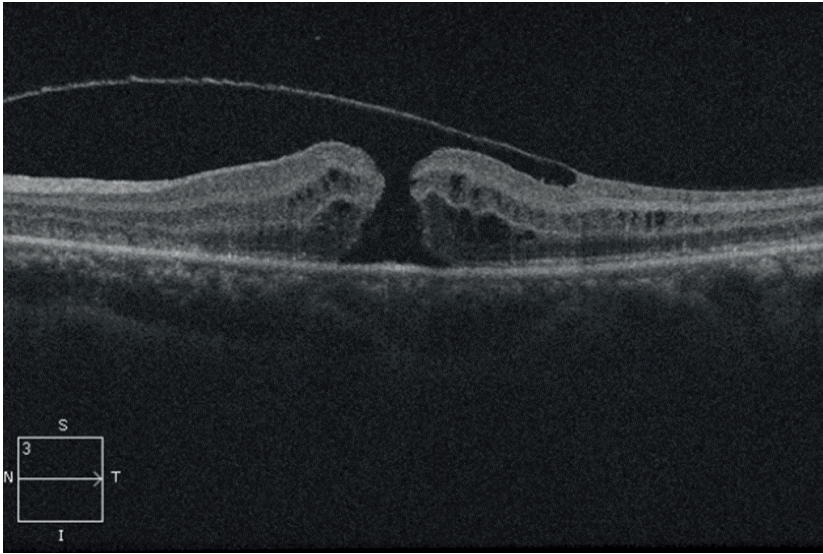


Fig. 2. Left-eye OCT showing FTMH and partial PVD.

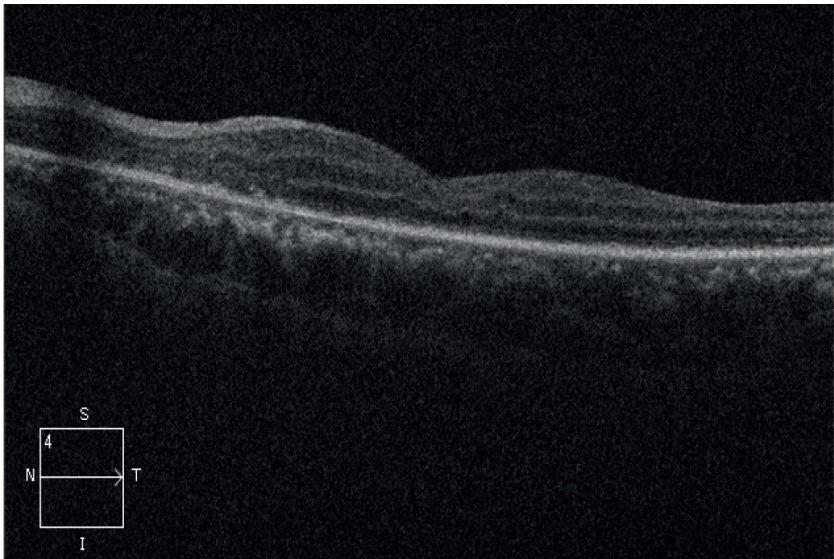


Fig. 3. Left-eye OCT at one-month follow-up showing spontaneously closed macular hole.

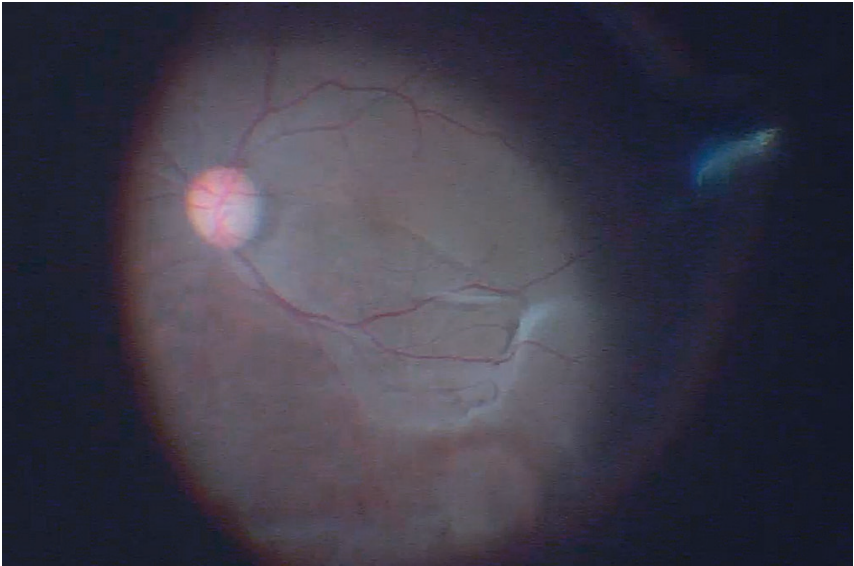


Fig. 4. Intraoperative photo showing spontaneously closed macular hole. Localized inferior RRD was noted with macula-on .

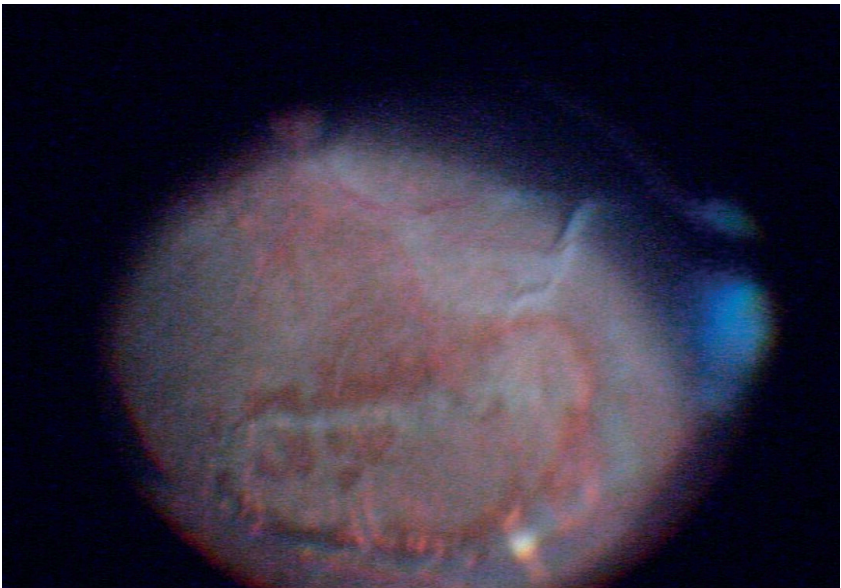


Fig. 5. Intraoperative photo showing multiple retinal holes surrounded by an area of hyper- and hypopigmented retinal atrophy.

Discussion

This is an uncommon case of multiple ocular injuries secondary to lightning. The pathogenesis of FTMH and RRD induced by lightning is not clearly understood. Besides, there are no clear guidelines for the treatment of both conditions when specifically caused by lightning. Our suggestion for treatment options and prognosis are given below based on our experience of managing this case.

Handa *et al.*¹ have reported a case of maculopathy which initially presented as retinal cysts with surrounding oedema and later evolved to simulate a full-thickness hole. This suggests that macular oedema due to lightning injury can coalesce to form a FTMH. Our patient had a spontaneously closed FTMH. Lee *et al.*² reported a similar case with a good visual outcome. We propose that this could be due to resolution of traction by PVD after inflammation subsides, subsequently leading to restoration of normal foveal contour and macular hole closure. There is no specific guideline regarding duration before the spontaneous closure of macular hole occurs. Nonetheless, surgery has been proven to be effective in restoring normal macular structure, but visual outcome remains poor despite anatomical closure.^{3,4}

Lightning-induced retinal detachment has also been reported in the literature,^{4,5} However, its occurrence is relatively rare. Espaillat *et al.*⁵ postulated that “heating of the retinal surface, the concussive forces on the eye, and a sudden lateral contraction of the attached vitreous results in posterior vitreous detachment and peripheral retinal break” lead to RRD. In our patient, patches of pigmentary degeneration and retinal atrophy that resemble traumatic chorioretinitis had been observed. This phenomena has also been reported by Zsolt Biro *et al.*⁶ Multiple atrophied retinal holes had been observed in our patient, which worsened progressively during follow-up. The progression of retinal atrophy and retinal holes had led to the failure of gas tamponade and recurrent detachment. A similar case of recurrent detachment after scleral buckle surgery and gas tamponade has also been reported by Espaillat *et al.*⁵ Postoperative visual acuity of the reported case⁵ and that of our patient are no better than 6/30.

Conclusion

In summary, we hope this report can help clinicians recognise the retinal changes after a lightning strike with the knowledge that spontaneous FTMH closure is not uncommon. Retinal pigmentary changes are at risk of developing retinal break and retinal detachment with unknown risk period. Thus, silicone oil tamponade is the preferred tamponade agent based on our experience in managing this case in view of the possibility of progressive chorioretinal atrophy and formation of more retinal holes.

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