

## Comotio Retinae: A Report of 4 Consecutive Cases

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**Abstract:** Blunt ocular trauma can lead to a myriad of ocular complications involving the anterior segment, posterior segment or both. Comotio retinae is a condition resulting from a countercoup mechanism, which can present with varying grades of visual impairment depending on the severity of the inciting injury. When very severe it can lead to acute visual loss. It is referred to as Berlin's edema when it involves the macula. Although recovery of vision is common, some patients may sustain a permanent visual impairment if it results in retinal pigment epithelial changes in the macula. We report a series of 4 consecutive cases of Comotio retinae (Berlin's edema) who showed signs of anatomic recovery with concurrent improvement in visual acuity.

**Keywords:** Berlin's edema, blunt ocular trauma, Comotio retinae.

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### I. Introduction

Comotio retinae is characterised by a transient, well defined greyish-white opacification of the retina occurring after blunt ocular trauma. The opacification may involve large areas of the peripheral retina or may be confined to the macula. When it involves the macula, it is referred to as Berlin's edema.

Comotio retinae was first described by Berlin in 1873.<sup>[1]</sup>

Comotio retinae is typically caused by an anterior segment trauma that produces a contusion injury by a countercoup mechanism.<sup>[2]</sup>

The pathogenesis of comotio retinae has been elaborately studied. It was originally postulated that comotio retinae was caused due to extracellular edema<sup>[1]</sup>. In a study by Hui and associates<sup>[3]</sup> on a rabbit model, it was concluded that the severe retinal contusion was mainly due to disruption of the photoreceptor and RPE cells and partly due to breakdown of the blood-retinal barrier. Recent reports on the histopathological studies have revealed disruption or fragmentation of the photoreceptor outer segment of the retina as the most common finding in patients with comotio retinae.<sup>[4,5]</sup>

Visual acuity in patients with comotio retinae can be normal if the injury is confined to the peripheral retina and if the injury has not resulted in any other ocular damage. However, if macula is involved, it may lead to loss of central vision.

### II. Case History

**CASE 1:** A 10 years old male presented with blurred vision in his right eye after blunt injury by a cricket ball. On examination, his best corrected visual acuity was 6/9 in the right eye and 6/6 in the left eye. Anterior segment evaluation was normal in the left eye and revealed a mild grade anterior uveitis in the right eye. The intraocular pressure in both eyes was 14 mm Hg by Rebound tonometer. Fundus examination was normal in the left eye. The fundus of the right showed a normal optic disc with a small choroidal rupture inferotemporal to the optic disc. There was a localised area of Berlin's edema in the inferonasal quadrant of the macula as seen in Fig.1. The child was treated with topical steroids in a tapering dose ( Prednisolone acetate 1% eye drops). After 2 weeks of treatment, the Berlin's edema showed signs of resolution and concomitant with the anatomic improvement, the visual acuity also improved to 6/6. (Fig.2)

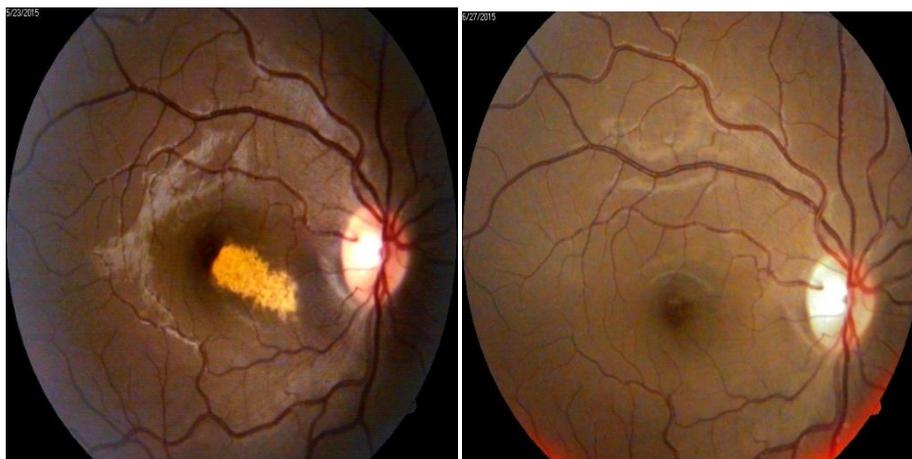


Fig 1. Berlin's edema with small choroidal rupture in the RE. Fig 2. Complete resolution of Berlin's edema

**CASE 2:** A 55 year old male patient presented with complaints of pain and defective vision in his right eye of 2 days duration following a blunt injury to his eye with agricultural equipment. On examination, his best corrected visual acuity was 6/24 in the right eye and 6/6 in the left eye. Anterior segment evaluation was normal in the left eye and right eye revealed a small grade I hyphaema with a severe anterior uveitis. The intraocular pressure in the right eye was 8 mm Hg and in the left eye was 14 mm Hg by Rebound tonometer. Fundus examination was normal in the left eye and showed an area of commotio retinae in the inferior quadrant of the peripheral retina in the right eye. (Fig. 3). This patient was treated with topical steroid eye drops (Prednisolone acetate 1%) in tapering doses and cycloplegics (Homatropine eye drops). The commotio retinae showed signs of improvement at 3 week follow up visit (Fig. 4).

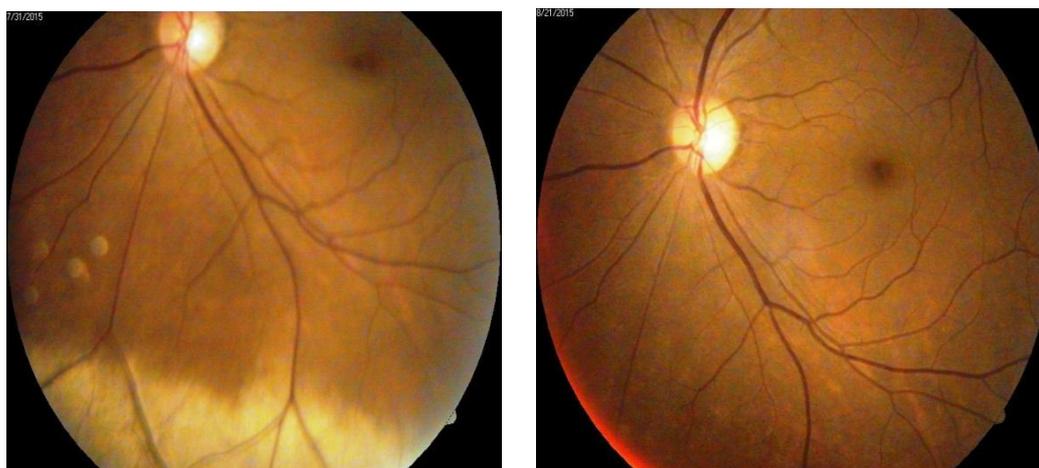


Fig 3. Commotio retinae in the inferior quadrant in LE Fig 4. Resolution of commotion retinae

**CASE 3:** A 20 year old male patient presented 48 hours after blunt trauma to his right eye from a cricket ball. Visual acuity was 6/12 in the right eye and 6/6 in his left eye. Anterior segment evaluation was normal in the left eye and right eye revealed a mild grade anterior uveitis. The intraocular pressure in both eyes was 16 mm Hg by Rebound tonometer. Fundus examination was normal in the left eye and right eye showed a localised area of Berlin's edema in the macula (Fig 5) with areas of commotio retinae in the inferior quadrant of the peripheral retina. This patient was treated with topical non-steroidal anti-inflammatory agent Nepafenac(0.1%) thrice daily. The Berlin's edema and commotio retinae showed signs of improvement at two weeks follow up visit (Fig 6).

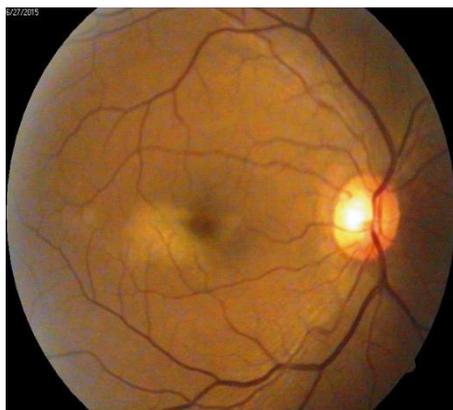


Fig 5. Berlin's edema in the right eye

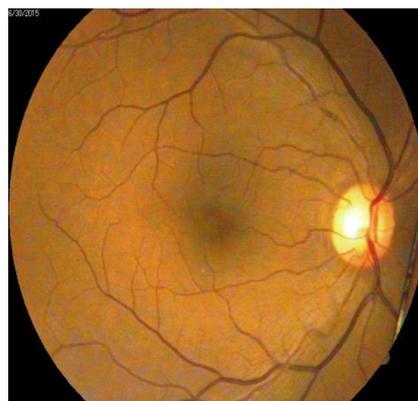


Fig 6. Resolution of Berlin's edema after 2 weeks

**CASE 4:** A 50 year old male patient presented 4 hours after blunt trauma to his left eye from a fall of coconut over the face. Visual acuity was 6/6 in both eyes. Anterior segment evaluation was normal in the right eye and revealed a large conjunctival laceration in the inferior bulbar conjunctiva and a mild grade anterior uveitis in the left eye. The intraocular pressure in both eyes was 16 mm Hg by Rebound tonometer. Fundus examination was normal in the right eye. The left eye showed a localised area of commotio retinae in the inferior retinal quadrant (Fig 7). The conjunctival laceration was sutured and the patient was treated with topical steroids which was tapered according to the clinical response. The commotio retinae showed signs of improvement at two weeks follow up visit (Fig 8).



Fig 7. Commotio retinae in the peripheral retina



Fig 8. Resolution of Commotio retinae

### III. Discussion

A patient who is diagnosed with Commotio retinae/ Berlin's edema due to blunt trauma needs a thorough eye examination to detect other serious accompanying ocular injuries like globe rupture, traumatic optic neuropathy and retinal tears which may lead to retinal detachment.

The visual acuity in commotio retinae varies from 6/6 to 6/120 and does not always correlate with the degree of retinal opacification. This visual loss may be transient or permanent. There is no known treatment specific to commotio retinae. Treatment is essentially supportive and directed to the associated manifestations of the injury.

Commotio retinae is usually self limiting and resolves without any complications and sequelae. The prognosis is excellent except in case of complications of choroidal rupture, hemorrhage or pigment epithelial damage. The outcome can be worsened if it results in retinal detachment or atrophy or hyperplasia of the retinal pigment epithelium.

### IV. Conclusion

Commotio retinae is one of the manifestations of blunt ocular trauma. Any patient with a history of blunt trauma to the eye requires a comprehensive eye examination and needs to be educated regarding the long-term implications of the injuries and the importance of followup. The patients in this case series were fortunate to obtain a good visual outcome but will require regular reviews to rule out long term sequelae of blunt ocular trauma.

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