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Case study

Purtscher's retinopathy: A case of severe bilateral visual loss due to chest compression

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ABSTRACT

We report a case of bilateral Purtscher's retinopathy in a young man following a motor vehicle rollover accident. Decreased vision was noticed on the fifth day following the trauma. Visual acuity in the right eye was close counting finger, and left eye, counting finger one meter. There was no evidence of direct ocular, head or facial trauma. Purtscher flecken, pre-retinal and retinal hemorrhages were present in both eyes. The right eye showed optic disc edema and more extensive areas of capillary dropout. Patient was treated with intravenous methyl prednisolone. After 5 weeks the right eye vision improved to counting finger one meter and left eye improved to 6/18. Early detection, proper documentation and treatment of the underlying causes in these cases is very important in order to avoid medico-legal pitfalls.

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INTRODUCTION

First described by Otmar Purtscher in 1910, Purtscher's retinopathy is a rare condition seen in patients with a history of trauma or other systemic diseases. Reduced vision is the primary symptom of this condition; which can be minimal or marked. Though usually bilateral, unilateral cases are also reported [1–3].

Various types of trauma, including chest compression or severe head injury, were reported among the common causes. A similar retinal appearance has also been described in a variety of conditions including acute pancreatitis, fat embolism syndrome, renal failure, childbirth, and connective tissue disorders [4,5].

The exact pathogenesis of Purtscher's retinopathy is not known. Hemorrhagic occlusion of the arterioles is presumed to be a major factor in the development of Purtscher's retinopathy.

Intermediate size emboli from various sources appear to be capable of producing features of Purtscher's retinopathy [1]. Complement activation induced leukocytic aggregation is also found in cases with Purtscher's retinopathy [6].

Common clinical signs include: Purtscher flecken (multiple discrete areas of retinal whitening in the retina between arterioles and venules which are variable in size) intra-retinal hemorrhages, cotton wool spots and optic disc edema [7].

CASE REPORT

A 24 year old male driver, who was not wearing a seatbelt, was involved in a rollover accident and thrown out of the vehicle. He sustained crush injuries as the wheel of the vehicle compressed his chest and abdomen from behind. There was no history of loss of consciousness.

On examination, there were no signs of direct ocular, facial or head trauma. He was found to have a fracture of the transverse process of the vertebrae from L1 to L5 and a fracture of the spinous process of L5.

He underwent an emergency exploratory laparotomy, suturing of a liver laceration and bilateral chest tube insertion.

Ophthalmology consultation was sought on the fifth day of admission, as the patient complained of decreased vision in both eyes. On examination, vision in his right eye was reduced to close counting fingers (CCF), and in his left eye to counting fingers at one meter (CF 1 m). The right eye showed relative afferent pupillary defect (RAPD), and optic disc edema.

Pre-retinal hemorrhage in front of the macula, intra-retinal hemorrhages, discrete areas of retinal whitening (Purtscher flecken) and cotton wool spots were present in both eyes (Figs. 1, 2 and 4). On the basis of these findings he was diagnosed as having bilateral Purtscher's retinopathy and was given methyl prednisolone 1 g via intravenous slow infusion, once daily, for three days.

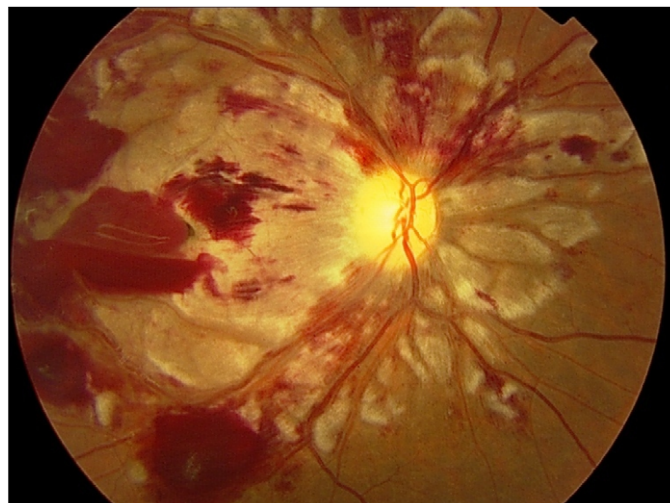


Figure 1. Right eye fundus photograph shows optic disc edema, Purtscher flecken (white areas), retinal and pre-retinal hemorrhages.

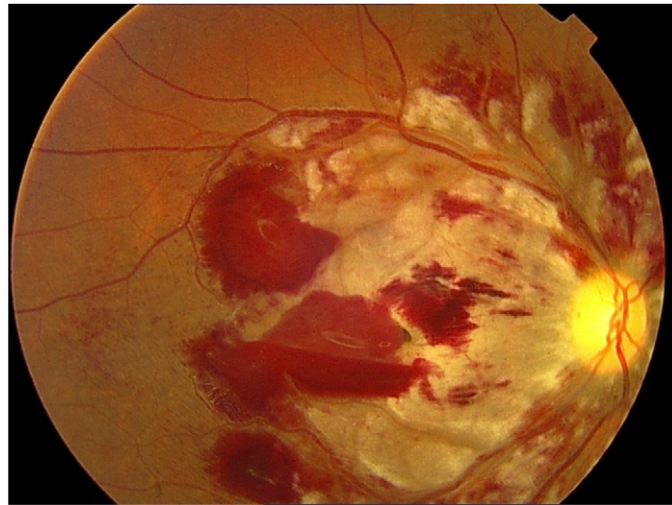


Figure 2. Right eye fundus photograph, another view.

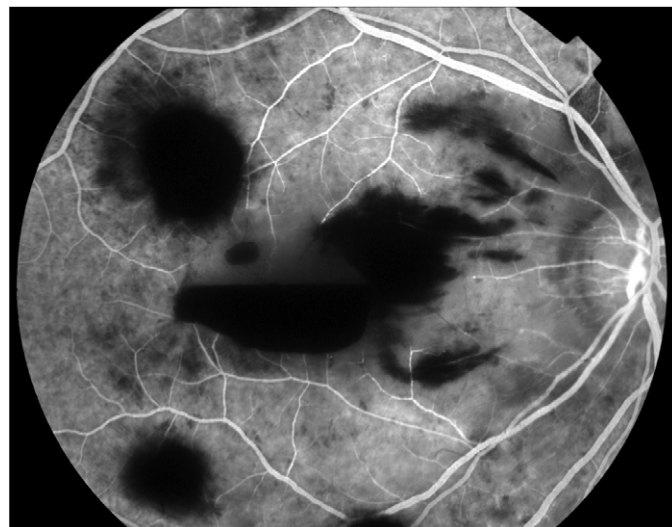


Figure 3. Right FFA shows areas of blocked fluorescence corresponding to the areas of hemorrhage and capillary dropout in the areas of Purtscher flecken.

Fundus Fluorescein Angiogram (FFA) was done three weeks after the injury as the patient was prescribed strict bed rest by the orthopedic surgeon. FFA revealed blocked fluorescence in the sites corresponding to the retinal and pre-retinal hemorrhages, capillary dropout in the areas of Purtscher flecken and cottonwool spots(Figs. 3 and 5).

A review 5 weeks after the injury showed right eye vision improved to CF 1 m and left eye to 6/18. The optic disc edema in the right eye had diminished. The pre-retinal and intra-retinal hemorrhages in both eyes were significantly reduced. Further follow up was not possible as the patient returned to his home country.

DISCUSSION

Though Purtscher's retinopathy is a rare condition, the chances of developing unilateral or bilateral severe reduction in visual acuity in patients, with no apparent ocular or even head or facial injury, makes it a very important entity. The decreased vision is usually noted 2–4 days after trauma as the patient recovers from the initial shock.

Due to the peculiar anatomy of the blood supply of the peri-papillary retina and macular area, the retinal changes are usually confined to these areas and this was very evident in our case. The

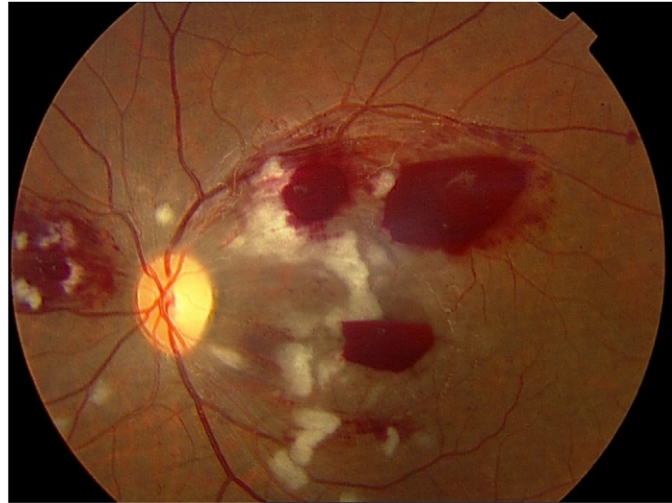


Figure 4. Left eye fundus photograph shows a milder picture, with no involvement of the optic disc.

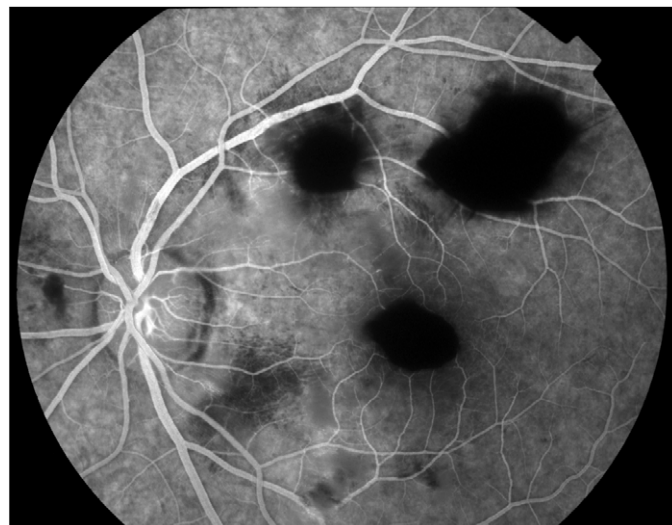


Figure 5. Left FFA shows blocked fluorescence and capillary dropout.

arterioles and capillaries in these areas are more susceptible to embolic occlusion as a result of fewer arteriolar feeders and fewer anastomoses [1,8].

Our patient suffered severe chest compression from the vehicle wheel which initiated a cascade of events resulting in the occlusion of pre-capillary arterioles of the retina and the development of Purtscher's retinopathy. The findings were more severe in the right eye with optic disc edema and RAPD.

Prognostic factors indicating poor visual outcome include optic disc edema, leakage seen in FFA, choroidal hypoperfusion, involvement of the outer retina and retinal capillary non perfusion [1,9]. The presence of optic disc edema and more extensive areas of capillary non-perfusion may be the causes for the poor visual recovery in the right eye. In a series of cases reported by Agrawal A and McKibbin M, spontaneous improvement of at least 2 Snellen lines was seen in 50% of cases [7].

At present there are no definite guidelines for the treatment of this disease. Treatment of the precipitating factor is important. There are isolated case reports of successful treatment using high-dose intravenous steroids [4,10]. The success may be due to the ability of the high dose steroids to stabilize the damaged neuronal membrane and microvascular channels.

In our case, the patient failed to show any rapid improvement after treatment with I.V. methyl prednisolone. The visual recovery was very poor in right eye while in the left eye visual recovery was

in parallel with the clearing of the retinal and pre-retinal hemorrhages. This indicates that the positive response to I.V. methyl prednisolone, in cases of Purtscher's retinopathy, is not a universal outcome but may vary according to the presentation of each case. Similar results were reported by Agrawal and McKibbin [7].

Non-ophthalmologists, especially those involved in trauma care should be aware of the possibility of the development of this potentially blinding condition even in cases with no evidence of direct ocular involvement by trauma. Early detection, proper documentation and treatment of the underlying causes in these cases are very important in order to avoid medico-legal pitfalls.

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