CASE REPORT

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Sudden loss of vision following bilateral closed femoral nailing: a case of Purtscher's retinopathy

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Non-ocular causes of loss of vision following polytrauma have been rarely reported in the literature. We report a case of Purtscher's retinopathy in a 20-year-old male patient who had bilateral femur fracture. His vision became normal at 8 weeks follow-up without any intervention.

Key words: Fat embolism syndrome; femur; fundus; Purtscher's retinopathy; retinopathy; trauma.

Sudden loss of vision following polytrauma could be due to fat embolism syndrome or due to displacement of the retinal vessels by fat emboli.[1-4] First described in 1910 by Purtscher in a patient with head trauma,[5-7] Purtscher's retinopathy has been reported occasionally following long bone fractures.[1,6,8,9] The condition resolves completely within a few weeks in most of the cases.

Case report

A 20-year-old male patient sustained a bilateral femur fracture with a fracture of the left lateral femoral condyle in an alleged road traffic accident (Fig. 1). Chest radiographs were normal. CT scan of the brain showed mild diffuse brain edema.

Once the patient was hemodynamically stabilized, he underwent closed nailing of both femurs and open reduction of the lateral femoral condyle fracture (Fig. 2). The procedure was done under general anesthesia and lasted for over 7 hours. He was afebrile, and his arterial blood gas study was normal. The patient received 4 units of cross matched blood in the operating room and another unit the subsequent day. There were no petechial spots over his body and in the oral cavity. There were no signs and symptoms suggestive of fat embolism syndrome as per Gurd's criteria.

On the first postoperative day, he complained of loss of vision in the right eye.

On examination, his right eye showed normal anterior segment, and a vision of counting fingers close to face (CFCF) only. Pupil dilated by mydriatic and fundus showed normal optic disc and multiple patches of retinal whitening around the optic disc, also involving the macula. Left eye showed small lid laceration and subconjunctival haemorrhage. Pupil dilated by mydriatic and fundus was normal.

The patient was diagnosed with Purtscher's retinopathy in the right eye. A fundus photograph was taken, and the patient was advised follow up (Fig. 3).

At 2 weeks follow up, ophthalmic findings were as follows: the right eye vision improved to CF 2 meters; there was no improvement with pinhole (NIP); and the left eye vision was 6/6.

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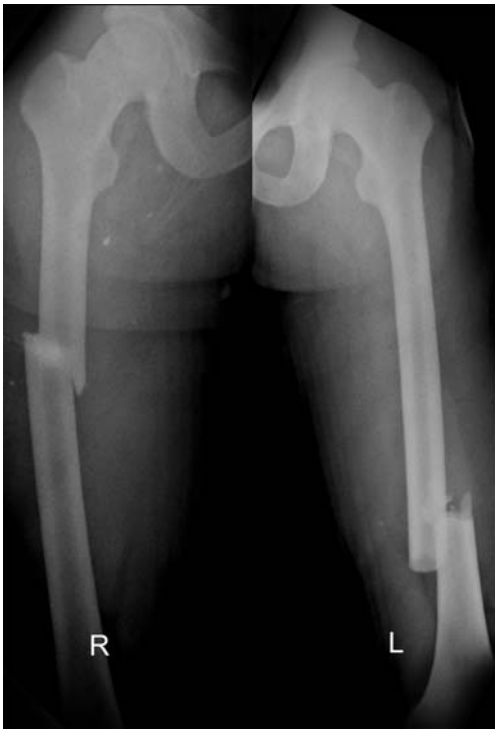

Fig. 1. Plain radiographs of both femurs showing the femur fracture.

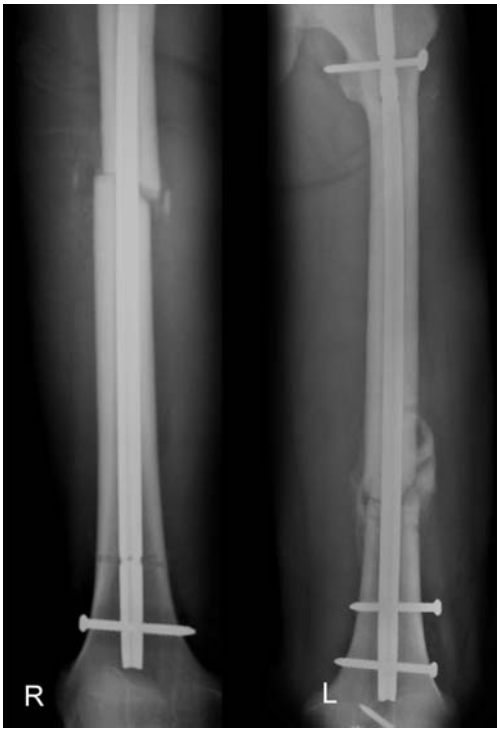

Fig. 2. Postoperative plain radiographs showing the femur fracture fixed with intra medullary nails.

Pupillary reactions were normal, and there was no RAPD (relative afferent papillary defect). A fundus examination of the right eye showed patches of retinal whitening around the optic disc fading away, and the left eye fundus was normal (Fig. 4).

The patient was seen after 6 weeks in the eye clinic. Ophthalmic findings were as follows: vision in the right eye, 6/12 NIP, and the left eye, 6/6. A fundus examination of the right eye showed further clearing of retinal lesions. The left eye fundus was normal. At 2 months follow-up, the lesions completely disappeared, and he regained 6/6 vision in the right eye (Fig. 5).

Discussion

Purtscher's retinopathy is a phenomenon where there is a sudden deterioration of vision without injury to the

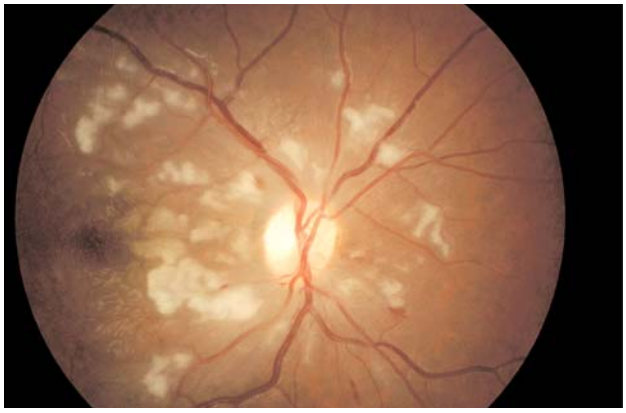

Fig. 3. Fundus photograph of the right eye showing the cotton wool patches typical of Purtscher's retinopathy. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

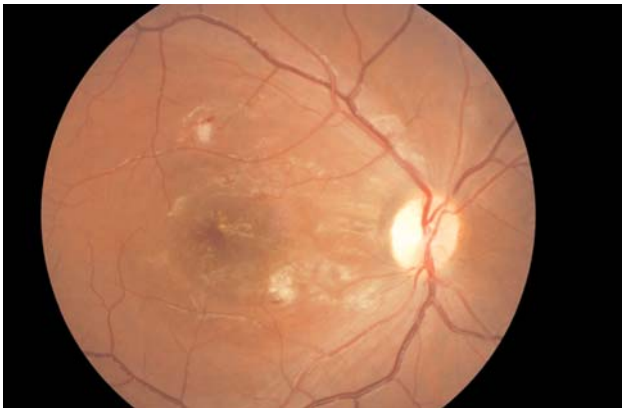

Fig. 4. Fundus photograph of the right eye at 2 weeks showing the lesions fading away. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

globe. First description was by an Australian ophthalmologist in a patient with head trauma.[5,7] The disturbance follows soon after the trauma, and progresses over a period of 1 to 2 days, and in most of the patients resolves completely within 3 to 4 months.[6,10] The onset may immediately follow trauma or may be delayed while it may be unilateral or bilateral.[7,10] In most cases, the visual acuity improves without any treatment. However, in severe cases pigmentary changes and optic atrophy may occur,[10] and when the macular arterioles are involved, the visual prognosis is poor.[3] Pathognomonic change is seen in areas of retinal whitening in the inner retina between retinal arterioles and venules, with a characteristic clear zone without retinal whitening known as Purtscher flecken.

The aetiology has been attributed to fat embolization[7] or retinopathy due to increased arterial hydrostatic pressure or venous intravascular pressure or due to complement mediated leukoembolization.[7] Certain authors suggested retinal arteriolar embolization as the cause of visual disturbance.[2,3] Acute cortical blindness of both eyes due to fat emboli in the posterior cerebral arteries was reported following manipulation of the fracture, but the fundus examination was normal in their case.[4] In our patient, the ischemic retinal changes could be the cause of retinal lesions.

Since our patient underwent surgery for a bilateral femur fracture, we thought that the visual disturbance was due to fat embolism syndrome (FES). The incidence of FES may be around 5-10% in patients with multiple fractures,[9] but retinal lesions are seen in only 50-60% of patients with FES. Chuang et al. reported that subclinical fat embolism syndrome could be diagnosed based on a fundus examination in a patient with multiple long bone fractures.[11]

The cotton-wool patches of Purtscher's retinopathy are due to microinfarction of the nerve fiber layer of the retina. There is generalized retinal and macular oedema. The lesions are typically restricted to the posterior pole, and accompanied by minimal or no retinal haemorrhage and without any visible emboli in the large retinal vessels[5] in contrast to retinopathy of the FES.

Cherry red spot formation seen in the FES and Purtscher's-like retinopathy is not a feature of traumatic Purtscher's retinopathy.[12] In the retinopathy of the FES, along with cotton-wool patches, haemorrhages and retinal oedema, there are systemic manifestations.[1,2] Ocular examination of FES shows intraretinal hemorrhages along with cotton-wool patches. The fat emboli which are initially hidden by the infarcted retina may be visible as small yellowish-white plaques after about 2 weeks.[9] Retinal lesions in FES also resolve without treatment.

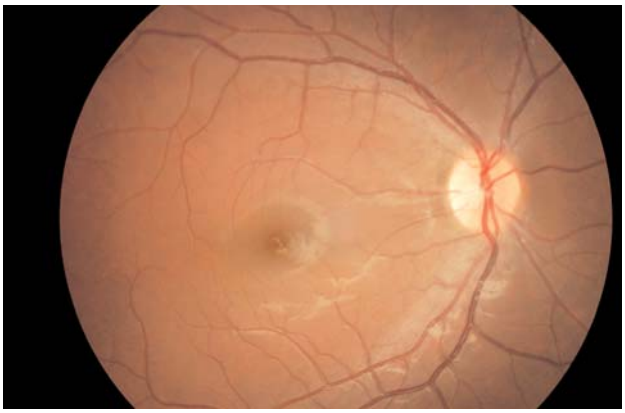

Fig. 5. Fundus photograph of the right eye showing clearing of the lesions. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

In FES the lesions may appear anywhere in the fundus whereas in Purtscher's retinopathy, lesions are located in the peripapillary area and the posterior pole.[3] Most people with Purtscher's retinopathy are aware of the visual loss unlike those with FES. In FES, cotton wool spots and small blot hemorrhages are seen, whereas in Purtscher's retinopathy, there are large white retinal patches representing areas of confluent ischaemia.[3]

Roden et al. concluded that the differentiation of retinopathy associated with extraocular trauma into Purtscher's retinopathy and FES is arbitrary and it has no clinical or pathological foundation.[1]

Steroids were used by Micha et al., and Agrawal and McKibbin, however they have not been proved useful.[5,6] Nor-Masniwati et al. reported good outcome with oral indomethacin in a patient with Purtscher's-like retinopathy.[13]

Conflicts of Interest: No conflicts declared.

References

1. Roden D, Fitzpatrick G, O'Donoghue H, Phelan D. Purtscher's retinopathy and fat embolism. Br J Ophthalmol 1989;73:677-9.
2. Nentwich MM, Remy M, Schaller UC. Ocular fat embolism syndrome. Int Ophthalmol 2011;31:15-6.
3. Buckley SA, James B. Purtscher's retinopathy. Postgrad Med J 1996;72(849):409-12.
4. Shahrulazua A, Ariff MS, Aziz MA. Cortical blindness in fat embolism syndrome following fracture manipulative procedure. Malaysian Ophthalmol J 2010;4:35-8.
5. Agrawal A, McKibbin M. Purtscher's retinopathy: epidemiology, clinical features and outcome. Br J Ophthalmol 2007; 91:1456-9.

6. Peled M, Rubin A, Pikkel J, Laufer D. Purtscher's retinopathy associated with mandibular fracture: a case report. J Trauma 1996;40:141-3.
7. Watkins RC, Hambrick EL, Martin M, Washington M. Purtscher's retinopathy: a case of visual impairment associated with multiple trauma. J Natl Med Assoc 1993;85:557-9.
8. Chan A, Fredrick DR, Leng T. Neovascularization in Purtscher's retinopathy. Clin Ophthalmol 2011;5:1585-7.
9. Handa S, Au Eong KG. Visual disturbance after traumatic femur fracture. Postgrad Med 2005;118:45-6.
10. Nayak H, Harun S, Palimar P. Purtscher's retinopathy after fracture dislocation of shoulder joint. Emerg Med J 2005;22:831-2.
11. Chuang EL, Miller FS 3rd, Kalina RE. Retinal lesions following long bone fractures. Ophthalmology 1985;92:370-4.
12. McLeod D. Why cotton wool spots should not be regarded as retinal nerve fiber layer infarcts. Br J Ophthalmol 2005; 89:229-37.
13. Nor-Masniwati S, Azhany Y, Zunaina E. Purtscher-like retinopathy following Valsalva maneuver effect: case report. J Med Case Rep 2011;5:338.