

المؤتمر السنوي الدولي للجمعية المصرية  
INTERNATIONAL CONGRESS OF THE

EGYPTIAN OPHTHALMOLOGICAL SOCIETY

**EOS 2023**



## **Role of mfERG after blunt trauma (case presentation)**

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- A 34-year-old man presented with left eye visual loss after blunt injury by a football.
- On examination, his visual acuity was **6/6** for the right eye and **1/60** for the left eye.
- There was mild hyphema in the left eye.

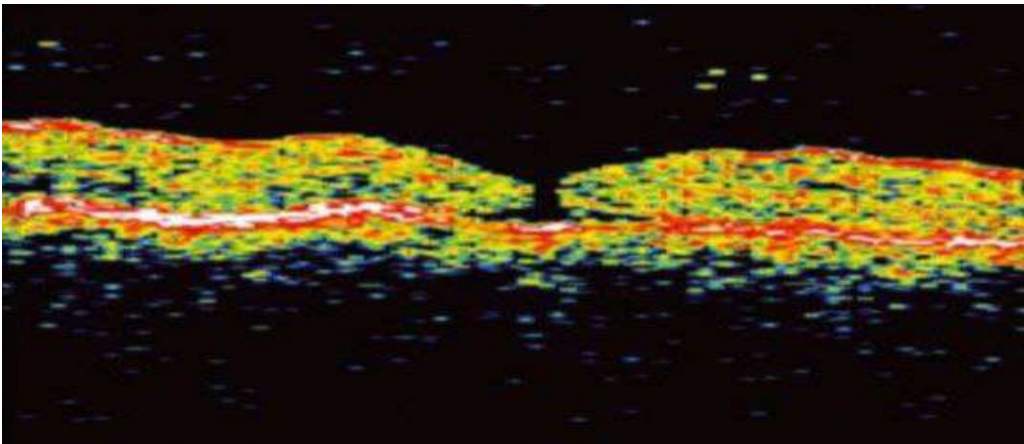


- Fundus examination showed a localized area of commotio retinae at the superior-nasal part of the macula.
- We prescribed for him topical cyclopegic, topical steroid, antibiotics, antiglucoma medication and antifibrinolytic medication with bed rest and follow up.



- Two weeks after injury, the hyphema resolved, and his left eye visual acuity improved to **6/36**.
- He noted a scotoma at the inferio-temporal visual field.
- Fundus examination revealed an area of mild retinal pigment epithelial atrophy at the site of the commotio retinae.

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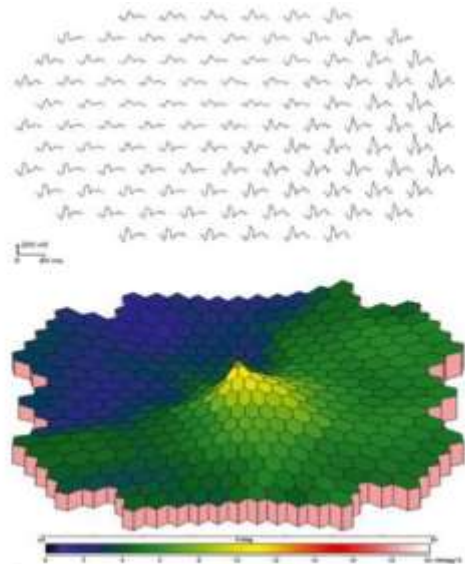


- Optical coherence tomography (OCT) imaging showed a 100 um **full thickness traumatic macular hole**.

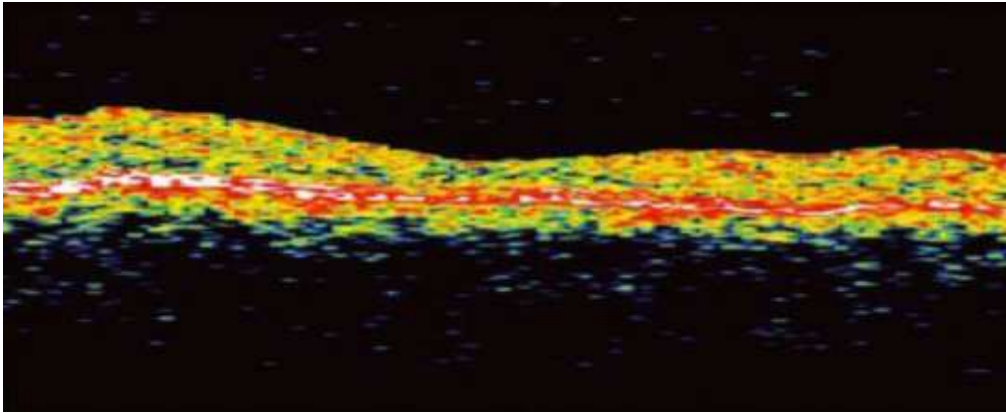
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- Multifocal electroretinogram (mfERG) showed reduction in retinal response density at the central macula with a well-demarcated area of depressed retinal response density in the superior-nasal part of the macula.



- He was observed and surgery was not performed to the macular hole.
- Six weeks after injury, the left eye visual acuity improved to **6/9**.



OCT revealed spontaneous closure of the macular hole.

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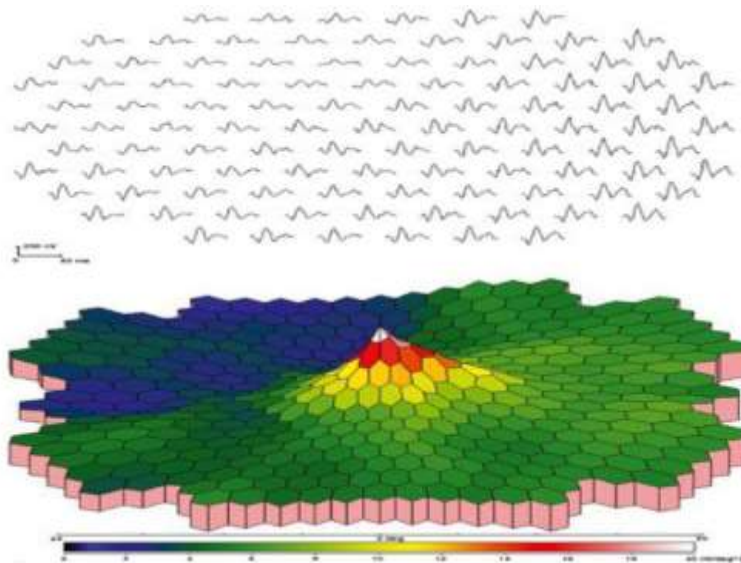
•At 10 months after injury, his left eye vision recovered to **6/6** but he still complained of scotoma at the inferio-temporal field.



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- Also, MfERG showed recovery of the retinal response density at the central macula due to closure of the macular hole.
- However, the well-demarcated area of depressed retinal response in the superior-nasal macula persisted secondary to the damage associated with commotio retinae.



- Previous studies have used OCT imaging in documenting the natural progression and spontaneous closure of traumatic macular holes anatomically.
- However, the functional changes following traumatic macular hole could not be assessed using OCT.



## Summary and conclusion



•The use of mfERG in our patient helped us to detect objectively the functional improvement after spontaneous closure of the traumatic macular hole by the recovery of the retinal response amplitude at the central macula.



- As observed in our patient, the inferio-temporal visual field defect which persisted after the injury corresponded to the area of the commotio retinae.
- This was confirmed objectively by the well-demarcated reduction in retinal response density in the mfERG.





- The mfERG results in our patient supported that permanent visual loss following commotio retinae may occur due to permanent loss of photoreceptors.



- mfERG is known to be an objective tool that has been used to assess retinal function in various macular disorders as:

1. Age-related macular degeneration.
2. Diabetic retinopathy.
3. Macular hole.
4. Retinal vascular occlusions.
5. Retinal drug toxicity.
6. Congenital retinal disorders, such as stargardt's macular dystrophy and retinitis pigmentosa.



## Take home message



**mfERG as a valuable tool for assessing the functional changes of the retina, in patients after blunt ocular trauma.**





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