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CLINICAL VIGNETTE

Keep an Eye on the Ruptured Globe

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Case Presentation

A 70-year-old female presented the day after New Year's Day for right eye pain. She tripped and fell forward in the parking lot and hit her right side the face on a cement stopper on New Year's Eve. Her right eyelid was swollen and painful. She was unable to open her right eye due to an extremely swollen eyelid. She was seen in the Northern California Emergency Room right after the injury and was diagnosed with periocular contusion. She was given small quantity of Norco for pain and instructed to use a cold compress. She had been using the Norco during the past three days with good pain relief. However when the pain medication wore off, she experienced a "tension headache" described as a severe deep ache in the right temple. She came to my office to get a refill of the Norco for her on-going pain. Other than the pain, she reported no change of mental status, fever, chills, nausea, vomiting, neck stiffness, extremity numbness or weakness.

Her past medical history was remarkable for prior deep vein thrombosis on warfarin. She was not on other chronic medications.

I reviewed the Emergency Department documentation from 3 days prior. The note reported right eye subconjunctival hemorrhage with mild chemosis. Pupil was equal, EOMI. No visual acuity testing was documented. Head CT was ordered to "rule out intracranial hemorrhage" with normal results. The note was generated by a resident physician with attending attestation.

Physical exam in the office included normal vital signs. Right upper and lower lid swelling and ecchymosis with right eye bullous subconjunctival hemorrhage. There was no light perception in the right eye. Stat maxillofacial bone CT showed hypodense material within the right globe consistent with hemorrhage. She was sent to Ophthalmology for immediate assessment.

Case Follow Up

Slit lamp examination showed a right eye inferior corneal sclera laceration. The patient was taken to the OR for emergency repair of ruptured globe. Her vision did not return and she continued to have extreme eye pain after surgery. Oral pain medication failed to control her pain and she eventually agreed to enucleation.

Discussion

The diagnosis of a ruptured globe can be difficult given the accompanying periocular and ocular swelling, and because the rupture often occurs under the rectus muscles, the wound may be occult. Complete ocular examination is important and should include measurement of visual acuity and testing for the presence of a relative afferent pupillary defect. Poor presenting visual acuity and the presence of an afferent pupillary defect are the most significant prognostic factors that can be detected on presentation. It is important to document these factors for clinical and medical legal reasons.

Most open-globe injuries can be diagnosed with simple pen light or flashlight examination. Smaller wounds may require slit-lamp examination for confirmation, to rule out associated injury, intraocular foreign body and endophthalmitis. Posterior rupture may be occult. Clinical signs of occult rupture include diffuse chemosis, asymmetric deepening of the anterior chamber, low intraocular pressure, hemorrhagic choroidal detachment and vitreous hemorrhage.

Fundoscopy examination should be attempted in all trauma patients. However, in the severely injured eye, anterior and posterior segment opacities often limit visualization. In such cases, it is imperative that CT scan performed. CT scan has reasonable sensitivity and specificity in the diagnosis of the open globe. Although a normal-appearing CT scan does not rule out an open globe, it provides important supportive information.¹

Patients with a history of significant ocular and periocular blunt trauma should be considered ruptured until proven otherwise. Delayed diagnosis carries devastating implications with poor visual outcomes. Peer review of this case deemed that the ER care was inadequate. Globe rupture was not evaluated or treated at time of initial injury visit.

It is often challenging for clinician educators to maintain focused, hands-on, direct patient care while assuming teaching responsibilities at the same time. They often struggle with time constraints, an overwhelming caseload and resident autonomy issues. In this case, when the resident put the indication for the CT scan as "rule out intracranial hemorrhage", the study was performed as a non-contrast head CT. When the attending ER physician was verbally informed of a "normal CT scan" from the resident, he mistakenly assumed it to be a normal maxillofacial bone CT scan because that would have been the

correct study under the circumstances. This assumption led the attending physician down the wrong path. The devastating outcome from this fateful New Year's Eve encounter shook the confidence of this veteran teaching attending and led to early retirement.

REFERENCES

1. **Pieramici DJ.** Open-globe injuries are rarely hopeless.
Review of Ophthalmology 2005.

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