Orbital Blow-Out Fracture in a College Baseball Player

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ORBITAL-WALL BLOWOUT fractures occur when intraorbital pressure increases as the globe (eye) is pushed posteriorly. The rise in pressure causes the orbital bones to break at their weakest points. Sites most commonly affected are the floor and medial wall of the orbit. In sports these fractures are often produced by blunt trauma to the eye by an object such as a ball, racket, or finger. Although blowout fractures often produce immediate pain and disability, they do not constitute medical emergencies. Proper management is necessary to minimize long-term damage and rule out other associated injury.[1] Common clinical findings include swelling of the soft tissue surrounding the globe; double vision, or diplopia; enophthalmos (sunken globe); and facial numbness. Surgical intervention is at times indicated to stabilize the fracture, release entrapment of extraocular muscles, or correct cosmetic deformity. This column describes a blowout fracture in a college baseball player and the treatment that followed.

Case History

While batting in a game, a 21-year-old male center fielder attempted to bunt. On contact with the bat, the ball deflected upward, striking the athlete in the right eye. The athlete fell forward holding his face. He was immediately attended on the field for initial assessment. The orbit was already swollen completely shut. The athlete also presented with epistaxis (nosebleed) and a small abrasion on the infraorbital rim of the right eye. Initial assessment ruled out cervical injury. Once the athlete was comfortable and confident with movement he was able to walk to the dugout for further evaluation. Although he complained of intense pain about the eye and slight nausea, he was cleared of signs of concussion. He suffered neither loss of consciousness nor memory deficits. Once the initial nosebleed stabilized, the athlete was transported to an on-campus urgent-care facility.

The athlete was evaluated by nursing staff at urgent care and cleared again of all head and neck injury. Further first aid was administered to control the nosebleed and orbital-rim abrasion. The team physician examined the athlete and obtained X rays from five different views. No definitive fracture was identified, but marked soft-tissue swelling involving the malar eminence was seen (see Figure 1).

The athlete was taken to a local eye-care clinic for evaluation of visual acuity and ocular motor function. A dilated-eye exam was performed by an ophthalmologist, who also reviewed the X rays with the team physician. All eye movements were found to be normal and unrestricted, but the athlete complained of pain with upward and lateral gaze. Vision was found to be normal with the exception of mild double vision. The athlete was prescribed prednisolone AC 1% (eye drops), homatropine 5% (eye drops), Vioxx®, and Tylenol® 3.

The following day, the athlete underwent CT scan. Plain-film radiography often fails to accurately identify blowout fractures. Computerized tomography (CT scan) is the imaging technique of choice. CT provides better visualization of the bony structures, as well as identification of the soft tissues.[1-3] Axial and coronal

Surgical Indications After Blowout Fracture

- Diplopia caused by extraocular muscle entrapment
- Enophthalmos greater than 2 mm
- Fracture involving one third or more of the orbital floor

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Figure 1 X ray. Arrows indicate the region of the fracture confirmed by CT scan. This area is poorly defined by plain-film radiography. Definitive diagnosis depends on further imaging.

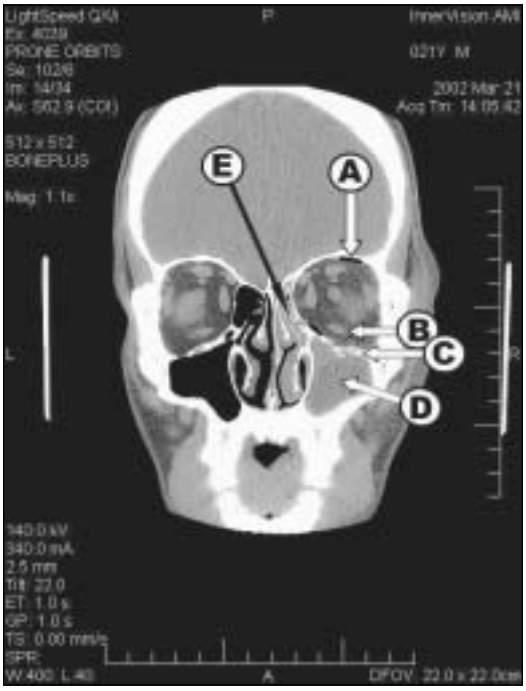

Figure 2 CT scan. (A) Air within the orbital cavity signifies orbital fracture. (B) Clearly defined borders of the rectus inferior signify no impingement. (C) Orbital-floor fracture. (D) Blood within the maxillary sinus. (E) Blood within the ethmoid sinus.

images were obtained through the orbits. An orbital-floor fracture with 2- to 4-mm displacement was found in addition to multiple fractures of the medial wall. A possible nondisplaced fracture through the anterior aspect of the right maxillary sinus was noted (see Figure 2). One common clinical finding of medial-wall fractures, epistaxis,[4] was present in this case. Fractures of this nature allow direct communication between the orbital and the paranasal sinuses, increasing the risk of infection.[1,2] To decrease this risk the athlete was placed on prophylactic antibiotics.

On the second day after the injury the athlete was reexamined by the ophthalmologist and had an initial consult with an ENT (otolaryngologist) for review of the CT scan. The CT scan identified borderline displacement of the inferior fractures and no obvious evidence of extraocular muscle entrapment. One indication for surgical fixation, prolonged diplopia, was present on clinical exam. Double vision after a blow-out fracture can be caused by enophthalmos, entrapment of the inferior rectus, swelling of the soft tissue surrounding the eye, or damage to the motor nerve.[2] It was not possible to determine whether the double vision was related to the edema or the displacement caused by the fracture. To allow sufficient time for swelling to resolve, surgery was postponed. Fourteen days from injury was to be the latest possible date because proper surgical correction beyond this time frame is inhibited by scar formation.[3]

The athlete was instructed to avoid sports activity, but he was permitted to participate in shoulder and scapular progressive resistance exercises (PREs). This was to maintain arm strength and not limit his throwing ability on return to full participation. He was advised to begin using a decongestant and was strictly prohibited from blowing his nose. Orbital fractures can initially present asymptomatically, but after forceful nose blowing, which can force air from the sinuses into the orbit (orbital emphysema), severe soft-tissue swelling can develop around the orbit, leading to visual deficits.[3,4]

Nine days after injury, the athlete was allowed to return to light activity with gradual progression, provided he remained symptom free. Early activity included playing catch and cardiovascular conditioning. In order to return the athlete to play as early as possible, maintaining arm condition was a priority. Early in his recovery, complaints of double vision limited the athlete's ability to safely catch a thrown ball, so a third person caught for him. Cardiovascular training included nonimpact activities such as on a stationary