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A Young Girl With Missile Trauma Near the Eye

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A 15-year-old girl who came to the emergency department holding tissue to her right eye said that she had been shot. She had right eye pain and swelling below the eye, and she was bleeding. As the girl was getting off a school bus, a male occupant in a car that was driving past reached out of the passenger side window and shot multiple pellets at the school bus with a pellet gun. The shooter was unknown to the girl; the shooting seemed to be random. When the girl was shot she felt pain immediately in the area between her right eye and the bridge of her nose and felt blood dripping down her cheek.

Physical examination revealed an ambulatory young girl who was tearful, alert, and in some discomfort, holding a tissue against the medial area of her right eye. Her vital signs were as follows: temperature, 36.4° centigrade tympanic; pulse, 104 beats per minute and regular; respirations, 20 per minute; and blood pressure, 110/70 mm Hg. She was in general good health, without any known health problems.

What do you suspect?

Discussion

The girl was triaged to an assessment room. Gauze moistened with sterile saline solution was applied to the area between the medial canthus of the right eye and the bridge of her nose to remove some of the blood. Once the blood was removed, a circular metallic object, which appeared to be a 17-caliber pellet, was visualized approximately 0.5 cm medial to the corner of the eye, with the majority of the pellet embedded within the skin (Figure 1). The right eyelid, cornea, and pupil showed no evidence of trauma. The pupils were equal, round, and reactive with some scleral

FIGURE 1

A 15-year-old girl who was shot as she was disembarking a school bus. The foreign body appeared to be a circular metallic 17-caliber pellet approximately 0.5 cm medial to the corner of her right eye, with the majority of the pellet embedded within the skin.

injection bilaterally as a result of the patient's crying. No hyphema was present. The periorbital skin below the right eye was noted to be slightly bruised and swollen.

After checking the visual acuity of both eyes (normal) and bilateral ocular motility (normal), the patient was sent for a lateral radiograph of her skull to determine the depth of penetration of the pellet. The lateral radiograph showed that the pellet had a mushroomed shape with metallic density (opaque white with distinct borders) and was located in the medial aspect of the right orbit. The pellet appeared to be within the soft tissues and was not imbedded in bone. No fracture was noted on the film.

The patient refused local anesthetic. With use of gentle traction, the pellet was removed without difficulty. An intravenous catheter was then used to irrigate the wound copiously with normal saline solution. There was no communication of fluid with the right nasal cavity. The resultant skin wound was small. A surgeon determined that very little cosmetic improvement would be obtained by using sutures, and thus none was placed. After a bandage was put

in place, the patient was instructed to apply bacitracin to the wound 3 times a day. She was also given prescriptions for cephalexin and hydrocodone bitartrate/acetaminophen (Vicodin).

Whereas the most common eye injury seen in the emergency department is corneal abrasion (with or without the presence of a superficial foreign body),¹ emergency nurses are regularly confronted with a wide range of ocular conditions. Physical assessment of a patient with eye trauma should proceed in a prescribed order prior to any treatments. The only exception to this rule occurs with direct chemical injury to the eye, which requires immediate intervention with copious irrigation² before attempting to determine visual acuity.^{2,3} When chemical injury has not occurred, the systematic examination of injured eyes should include an assessment of visual acuity, external eye surface, visual field test, pupil shape (the pupil should not appear oval or pear-shaped),⁴ ocular motility, and an internal eye examination.

Associated eye trauma should be expected when a patient presents with lid laceration (especially when both upper and lower lids are injured), a shallow anterior chamber, pupil shape irregularities (a misshapen pupil often points in the direction of the penetration), hyphema, or significantly decreased visual acuity.

Careful examination of the eye is required when a penetrating injury is closely positioned near the eye, but neurologic examination should also be included whenever deep penetration is suspected. Associated eye trauma should be expected when a patient presents with lid laceration (especially when both upper and lower lids are injured), a shallow anterior chamber, pupil shape irregularities (a misshapen pupil often points in the direction of the penetration),¹ hyphema, or significantly decreased visual acuity.³

Although in this case the pellet did not penetrate the globe and the right eye was normal upon examination,

there was some concern regarding possible damage to the patient's nasolacrimal duct system. However, an ophthalmologist who was consulted determined that this patient's risk for such disruption was low, because most serious damage to the nasolacrimal duct system occurs when a patient sustains a deep laceration to both the upper and lower eyelids medial to the punctum (opening of the tear duct).³ In such a case, immediate referral to an ophthalmologist for microsurgical repair to reestablish patency of the duct is required.³ This patient was scheduled for a follow-up appointment with an ophthalmologist to further evaluate her nasolacrimal system.

Section Editor's teaching points

This sad case bears testament to the violence with which many young people are confronted every day. Although the patient was most fortunately not seriously injured, the emotional impact of having sustained a wound to the face under such circumstances should be considered in the follow-up care plan.

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