Traumatic Eye Injuries From Collapsible Wire Laundry Hampers

abstract

Two patients presented to the University of Illinois at Chicago Eye and Ear Infirmary within 1 year with penetrating eye injuries caused by similar collapsible cloth and wire laundry hampers. Penetrating eye injuries in children are relatively rare but can result in poor visual outcomes and multiple vision-threatening complications. Both injuries at the University of Illinois resulted in an eye laceration as well as retinal complications similar to those reported with a high velocity injury. This now represents a significant pattern of eye injury and suggests that there exists a nontrivial risk for all children in households with this type of collapsible laundry hamper. Parents should receive a warning of the risks of these hampers. *Pediatrics* 2013;132:e522–e525

AUTHORS: Adam L. Prickett, MD, Senem Salar, MD, Clement C. Chow, MD, Aisha S. Traish, MD, Yannek I. Leiderman, MD, PhD, Felix Y. Chau, MD, and Iris S. Kassem, MD, PhD

University of Illinois at Chicago Eye and Ear Infirmary, Chicago, Illinois

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Address correspondence to Iris Kassem, MD, PhD, University of Illinois at Chicago Eye and Ear Infirmary, 1855 West Taylor St, MC 648, Chicago, IL 60612. E-mail: ikassem@uic.edu

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A collapsible, cloth laundry hamper with an embedded, stiff wire spring around the perimeter is now widely available for purchase for household use from multiple manufacturers. The device comes packaged in the collapsed form and then expands to its full height and width (Fig 1B). When the sharp wire end is exposed (Fig 1A), it has potential to cause an ocular laceration resulting in an open globe injury, which is an ophthalmic emergency. Two cases of penetrating ocular injury in children presented to the University of Illinois at Chicago within the past year from collapsible hamper wire exposure causing eye lacerations.

CASE 1

An 11-year-old African American boy with no significant past medical or ocular history was at home placing clothes in a collapsible cloth laundry hamper (Fig 1A) when the wire mechanism within the hamper snapped up and struck his right eye. He initially presented 1 hour later to an outside hospital where he was noted to have a corneal laceration. Given the concern for a possible open globe injury, he was given 1 g of cefazolin intravenously and a tetanus shot, and a Fox eye shield was placed over the right eye for protection. He was then transferred to the University of Illinois by ambulance for further management. At the time of examination, his vision was hand motions, and he had an irregular, unreactive right pupil. He had a full-thickness 10 mm long corneal laceration. The anterior chamber was shallow with iris contacting the posterior edge of the laceration. There was marked ocular inflammation with a fibrinous membrane and a small amount of blood coating the iris temporally. These findings were consistent with an open globe injury. The patient underwent immediate surgical repair of the corneal laceration (Fig 2A). Intraoperative

findings included a dense cataract with a likely ruptured posterior lens capsule. Postoperatively, there was a small hyphema and a dense cataract. On brightness scan ultrasonography, the retina was attached with vitreous hemorrhage inferiorly. Postoperative vision at 1 week was stable at hand motion, presumably due to the traumatic cataract. At postoperative week 2.5, the patient underwent removal of the lens in conjunction with surgery of the retina and vitreous (pars plana vitrectomy). In addition to vitreous hemorrhage, a focal choroidal rupture was found. The patient's lens capsule was found to be ruptured, and because of inadequate capsule support, an intraocular lens was not placed at that

time (Fig 2). At 5 months postoperatively, his visual acuity was better than 20/20 with a specially fitted soft contact lens, although a sensory exotropia that developed during the period of poor vision persisted.

CASE 2

A 23-month-old African American girl with no significant past medical or ocular history was initially seen at an outside hospital within 1 hour after she complained of severe eye pain, tearing, and inability to open the eye after being poked in the eye from a wire protruding from a mesh and wire hamper. At the outside hospital, she was noted to have an irregular and displaced pupil that

FIGURE 1

A, Fraying of the cloth with wire under spring tension resulted in exposed wire far from its intended position. B, A similar style hamper with mesh to show the spiral design of the wire hamper to maintain a cylindrical shape. The inset shows the hamper in its collapsed form.

FIGURE 2

A, Right eye of case 1, 1 week after initial wound closure. There is an arcuate corneal laceration and dense cataract with a superonasally displaced pupil. B, Postoperative photograph of the right eye after removal of the lens and vitreous as well as laser of the retina.

was not reactive to light, as well as an irregular corneal surface. Because of concern for an open globe injury, she was given 500 mg of intravenous cefazolin and was transferred to the University of Illinois via ambulance. The patient was able to fix and follow with each eye, and the right pupil was irregular and unreactive. She had a 3- to 4-mm full-thickness corneal laceration from the pupillary margin extending to the limbus. The anterior chamber was shallow, and the pupil was displaced toward the location of the laceration. There was a fibrinous, pigmented membrane covering the pupil, with prolapsed iris tissue extending through the wound to the corneal surface. The patient underwent immediate surgical repair of the corneal laceration (Fig 3). On postoperative day 3, dilated fundus examination revealed vitreous hemorrhage and retinal whitening consistent with commotio retinae caused by a high-velocity impact of the eye. Brightness scan ultrasonography did not reveal any retinal tears or detachment. Over the next few weeks, the vitreous hemorrhage spontaneously resolved without intervention. The patient developed deprivational amblyopia of the right eye, and glasses and patching for 18 months have fully recovered her vision from 20/250 at 2.5 months after the injury to 20/20.

DISCUSSION

An open globe injury, as seen with these 2 cases, is defined as a full-thickness wound of any portion of the eye. In addition to a visible full-thickness laceration of the cornea or sclera, there are a number of signs and symptoms that are consistent with such an injury, including decreased vision, a history of loss of fluid or pigmented material from the eye, an irregular or unreactive pupil, a shallow anterior chamber, or a severe subconjunctival hemorrhage that is often bulky and 360 degrees around the cornea.

In the emergency department setting, it is essential to tape a clear plastic or metal Fox shield over the affected eye at all times other than during examination to prevent further injury or pressure. It is important not to patch the eye because this elicits pressure on the globe. Pressure to the eye could lead to expulsion of intraocular contents and worse visual outcomes.¹ A computed tomography scan of the orbits with 1-mm sections is usually recommended to rule out an intraocular foreign body. Broad-spectrum antibiotics are typically given as well as a possible tetanus booster, depending on the nature of the injury. Because these patients require surgical exploration, they should be made nothing by mouth as soon as possible to prevent any delay of surgery, and should undergo any necessary testing

(complete blood count, basic metabolic and coagulation panel, or drug/alcohol/pregnancy screen if indicated). The wound should be closed as soon as possible, preferably within 24 hours. If the patient needs to be transferred to a different hospital, they should do so in an ambulance and limit ambulation as much as possible, as postural changes can also cause prolapse of intraocular contents. Pain and nausea control are also important, because vomiting and bearing down can increase posterior pressure in the eye, causing loss of intraocular contents.

When a child or adult sustains a significant eye injury, the prognosis for these injuries can be approximated using the ocular trauma score.^{1,2} In all patients, there is a risk for vision loss from anatomic changes such as corneal scarring, cataract, or retinal damage. In children, however, there is the added risk for amblyopia, or lazy eye. This can happen because of a difference in the refractive error between the 2 eyes (anisometropic amblyopia), or from reduced visual input from a cataract or vitreous hemorrhage (deprivational amblyopia). In Case 2, this was especially important, because the patient did not have any anatomic abnormality in the visual axis (Fig 3). Therefore, it is likely that deprivational amblyopia from vitreous hemorrhage was the cause of the decreased vision. Even 1 year after the injury, her amblyopia continued to respond to treatment with patching of the normal eye.

In both patients, the excellent visual outcome was atypical for patients who have an open globe injury, regardless of age. In the study by Kuhn et al, the Ocular Trauma Score calculated for Case 1 and 2 had only 41% of patients achieving a vision of 20/40 or better, with 20/20 or better likely being far fewer in number. In the study by Acar et al, the Pediatric Ocular Trauma Score for Case 1 had only 1 of 11 patients with a vision of 20/32 or better. The younger age of the child in

FIGURE 3

Postoperative photo of case 2. The iris is adherent to the cornea at the site of injury, causing a mild displacement of the pupil.

Case 2 in addition to the vitreous hemorrhage resulted in a worse Pediatric Ocular Trauma Score for this patient. In this study, no children with the score of Case 2 achieved 20/20 vision. In fact, 3 of the 7 patients had no light perception.

When small children arrive in a household, parents are advised to baby-proof the home to remove possible hazards that may cause serious injury. The specific type of laundry hamper involved in these cases, seen in Fig 1, can pose a significant risk for eye injuries in children, and should be fully recognized as a hazard. The outer perimeter of the device is cloth, and sewn into the cloth is a spiraled, stiff wire spring. When contained within the cloth, the wire provides the structural support for the hamper, and can also be collapsed into a flat, compact form for storage (Fig 1B). Another style of hamper consists of a cubicle pattern in which the wire is encased in fabric in a rectangular configuration with mesh

or cloth inside the rectangle. If the sharp wire end is exposed, either from an incomplete cloth covering or from frayed fabric, it can represent a significant hazard from the sharp leading edge. In the first case presented here, it appears that the wire separated from the cloth and sprang into the patient's cornea at high velocity. Alternatively, it is possible that the exposed wire end was stationary and accidentally impaled the cornea at eye level for the child.

Of note, the laundry hamper that caused the injury in Case 1 included a small tag with a warning about discontinuing use if the cloth appears damaged. However, given the recent injuries despite such a warning, it appears that this warning label has been inadequate to prevent ongoing traumatic eye injuries.

CONCLUSIONS

A collapsible, cylindrical, cloth laundry hamper with an embedded, stiff wire

spring spiraling around the perimeter is now widely available for purchase for household use. When the cloth is frayed and the sharp wire end is exposed or released from the cloth, it has potential to cause a devastating ocular injury. Two cases of severe ocular injury in children due to contact with the free wire end of collapsible hampers presented to the University of Illinois at Chicago within 1 year. A third case of a corneal laceration in the area was also reported, with legal action and a settlement.³ This represents a significant pattern of eye injury and suggests that there exists a nontrivial risk for all children in households with this type of laundry hamper. It is thus important for parents, manufacturers, retailers, pediatricians, and health care staff to be aware of this risk and to take steps to help prevent further cases of severe eye injuries caused by these laundry hampers.

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