

## Could a burst toy balloon cause a major ocular injury like cataract in a child? A case report

### Case Report

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### ABSTRACT

Ocular injuries in children remain a largely preventable phenomenon, and the resulting morbidity may be life-long. A variety of objects have been implicated as causes of ocular injuries in children, but that resulting from a burst balloon on the face is rare, as this toy may not be recognised as potentially hazardous, especially in children. The case of a 3-year old Nigerian girl who presented with left cataract and esotropia (squint) following a burst toy balloon on the face is reported. This is aimed at drawing attention to the possibility that this common toy may have the potential of causing a major ocular injury especially in children. The need for adequate safety measures to be taken, while children are at play, is also emphasized.

**Keywords:** Air blast, cataract, childhood, esotropia, injury

### INTRODUCTION

Ocular injuries in children are capable of causing significant morbidity, and frequently results in monocular blindness, especially so, in resource poor settings.<sup>1,2,3</sup> Frequently reported objects causing ocular injury in children include sharp pointed objects, fireworks, and blunt objects.<sup>2,3,4,5,6,7,8</sup> These can happen during activities such as play, road traffic accidents and corporal punishments, in domestic, school and outdoor settings.

Reports of ocular injury due to burst party balloons are rare.<sup>1,2,9,10,11</sup>

Festive occasions such as birthday parties are regular occurrences in the life of most children and adults, and balloons are frequent accompanying decorative and playful features. The fact that balloons are potentially blinding toys especially in children may not be readily apparent to parents and guardians. Balloons may burst while the child is playing

with it very near the eye or while it is being inflated.

Most of the ocular injuries are usually mild to moderate and self-limiting, but some can be potentially blinding. Damage can occur in any part of the eye. This can involve the ocular adnexia, anterior and posterior segments of the eye, and injuries such as lid ecchymosis, corneal abrasions, hyphaema, mydriasis, cataract, uveitis, angle recession, *commotio retinae*, optic atrophy and retinal tear, have each been reported.<sup>10,11,12,13</sup> Remnant pieces of the balloon can also be retained in the eye as foreign bodies. Injury is due to the sudden release of a blast of air under pressure, resulting in blunt globe injury.

A similar mechanism of injury is seen in compressive air blasts and automotive air bag injury to ocular structures.<sup>14,15</sup> It is also possible that children may be more susceptible to the traumatic effect because of their small size and more fragile body tissues. Because of the relatively ubiquitous nature of balloons and their attraction to children, this report is aimed at drawing attention to the possibility that this common toy may have the potential of causing a major ocular injury, especially in children.

#### CASE REPORT

A 3-year old female child presented with a six-month history of a whitish speck in the left eye. This was said to have followed an explosion of an inflated balloon on her face while attending a birthday party about 1 year before presentation. She had developed an immediate redness, lacrimation and pain of the left eye, and was treated at a nearby hospital with eye drops.

Initial symptoms gradually subsided, but her parents subsequently, noticed a whitish speck in the injured eye, and this gradually progressed. Prior to the balloon burst, both her eyes were completely normal, and there

was no other history of ocular or facial trauma either before or after the balloon incident, and she did not have joint pains prior to the changes noted in her left eye.

She was a product of full term and uneventful pregnancy, and delivery and neonatal periods were without incidents. She was fully immunised, with normal developmental milestones. There was no history of visual impairment or eye defect in the family.

On examination, she was a healthy looking child, appropriate for age, with normal general and systemic examination. Visual acuity (VA) was not assessed due to absence of VA charts for children 3 years and below, but the child was able to walk around unaided. There was left esotropia of 30° (Figure 1), and lids, conjunctiva, cornea, anterior chamber and pupils were normal in both eyes.

**Figure 1.** Photograph of the patient showing left cataract and esotropia



The crystalline lens in the right eye was clear and the posterior segment revealed a healthy pink disc (cup disc ratio 0.3), normal vessels and macular. There was complete lens opacity in the left eye, precluding a view of the fundus (Figure 1), even after dilatation. Extra-ocular motility was normal in both eyes. A diagnosis of left traumatic cataract secondary to a burst toy balloon was made and patient was worked up to have cataract extraction, and subsequent treatment for amblyopia. Full blood count and serum electrolytes were within normal limits and ocular ultrasound

revealed normal posterior segment in the injured eye (Figure 2).

**Figure 2.** Ultrasound scan showing normal posterior segment in both eyes



Arrows shows flat retina in both eyes

## DISCUSSION

Ocular trauma is a source of significant morbidity and a frequent cause of monocular blindness.<sup>1</sup> The general pattern of risk by age presents a bimodal curve with peaks at the two extremes of life, but children present a particularly high risk in terms of magnitude and severity, as they are faced with longer years of living with permanent damage to one or both eyes.<sup>1</sup> Activities such as playing, as demonstrated in this case, remain a constant risk for ocular injury in them as well.

Studies in Nigeria show that more than half of ocular injuries in children occurred during play, especially unsupervised.<sup>2,8</sup> Adult supervision of children during play is likely to limit the possibility of serious injuries, and is frequently recommended. Reported childhood ocular injuries in Nigeria are usually due to sharp pointed objects projected by the child or others around them, and blunt objects in the form of missiles thrown at the eye.<sup>2,16</sup> To the best of our knowledge, this is the first report of ocular injury from a suspected burst toy balloon in Nigeria.

Francis reported ocular injury from party balloons involving three adults in the United Kingdom (UK), while Mokrohisky reported two cases involving toddlers who were injured while playing with the balloon in the United States of America. Injuries can involve any part of the eye or surrounding structures,

and can be mild to severe vision threatening ones. Francis and Mokrohisky reported mainly anterior segment injuries in their patients, as seen in this case who developed cataract, while Fraser, reported posterior segment injuries (retinal tear and haemorrhage).<sup>10,11,17</sup> However, the posterior segment was normal in this patient as shown in the ocular ultrasonogram (Figure 2).

The mechanism of ocular injury here is similar to that which results from any blunt force applied suddenly to the eye, which leads to compression of the antero-posterior diameter of the eye, with simultaneous expansion at the equatorial plane, associated with transient but severe increase in intraocular pressure, and resulting contusional and tearing damage to the globe, as well as possible fracture of the orbital floor.<sup>18</sup> The type and extent of the resulting damage will depend on the severity of the trauma and probably on some other factors.

These injuries can present immediately after the incident or sometime after, which can be days, months or years. The cataract was noticed in this patient six months after the initial injury, though she was said to have developed immediate soft tissue injury which later resolved, following conservative management with eye drops. The latent period of six months before the development of cataract may put to question the cause-and-effect relationship between the alleged causative agent (toy balloon) and the cataract. However, the parents denied any other form of ocular lesion or injury, prior to the incident or at any time within the intervening 6months after the incident, before her presentation to our service.

Apart from the blunt force to the eye, burst pieces of the balloon can also be lodged on the ocular surface as foreign bodies, with persistent irritation. Haemorrhage in and around the eye area can also occur. These balloons are also capable of causing non-

ocular injuries such as choking, aspiration, and death.<sup>19</sup>

Because toy balloons are common decorative and festive additions in our community, parents, guardians and children need to be educated about their potential for causing eye injuries, as a significant public health intervention process. Also, children should not inflate these balloons and unless under strict adult supervision, and in addition, balloons should be inflated moderately without undue tension inside. This will ensure that in the event of a burst balloon, the released air blast is not under high pressure, and damage to ocular structures, if any, will be minimal.

Wearing of ocular protective devices while inflating balloons even in adults has also be recommended, as well as use of inflating equipment to eliminate facial contact.<sup>10</sup> Manufacturers of balloons usually include a warning on the packaging of the possible risk of choking and aspiration, it may also be necessary that they include warnings on possible ocular injury following a burst and the preventive measures for it.

Ocular injury in children remains a largely preventable phenomenon, and that resulting from burst balloons is another aspect that is avoidable if adequate safety measures are taken during play.

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