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Ocular purpura in a swimmer

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Summary

Swimming goggles are increasingly being worn by children during swimming lessons to protect their eyes, although reports of ocular damage associated with their use is becoming more common. We describe a new injury, 'purpura gogglorum', caused by overtight application of faulty goggles. Whilst no permanent harm to the eyes resulted in this case, other swimmers have sustained more serious ocular damage, including loss of sight, from goggle-associated injury.

Keywords: goggles, swimming, ocular damage

Swimming goggles are often worn by children during swimming lessons because ocular symptoms are common without them. Whilst adenoviral-induced conjunctivitis (pharyngoconjunctival fever) and other organisms are usually inhibited by adequate chlorination of the water, high chlorine and ammonia concentrations frequently lead to watering, stinging or swelling of the eyes. We previously viewed these goggles as being harmless swimming accessories, but worrying reports of goggle-associated ocular trauma have been

accumulating, and we describe a further, hitherto unreported injury.

Case report

Our healthy seven-year-old daughter presented to us following her weekly swimming lesson with an extensive purpuric rash over her left eyelid (figure). The right eyelid was only mildly affected, but the eye itself was reddened and sore. The cause of these eye signs was not clear initially, until she later requested a new pair of swimming goggles. Apparently, the right eye-piece had started to leak during the lesson, filling with water and causing irritation to the eye. To stop the leak, she tightened the head band incrementally, pulling the goggles away from her face to empty out the eye piece. In doing so, not only had the pressure on the orbital soft tissues increased, but each time the goggles had been pulled away from the eye, a negative pressure had been induced by the normally functioning seal on the left side, producing suction petechiae. The effect was not so marked on the right side because of the faulty seal. The left eyelid subsequently became oedematous, but responded to treatment with a cold compress, the petechiae and the swelling resolving over 24 h without sequelae.

Discussion

We were alarmed to find many previous reports of significant eye injuries associated with the use of swimming goggles (box 1). Serious ocular injury has resulted when the eye pieces having been pulled away from the face to clean the lenses, slipped and recoiled into the unprotected eye.¹ Contact dermatitis from the neoprene cushion seals seems to be a common cause of red and oedematous eyes,^{2,3} and baggy, oedematous eyelids may result from excess pressure from stiff frames on the medial part of the upper lid.⁴ An acute corneal



Figure

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Swimming goggles may cause serious eye injury

<i>Injury</i>	<i>Mechanism</i>
Suction purpura	pulling tight goggles forward during cleaning
Oedema of the eye lids	excessive pressure from overtight application
Corneal erosions	use of anti-misting agents
Corneal/scleral perforation, hyphaema and visual loss	catapulting of the frames against the eye during cleaning
Contact dermatitis	from neoprene cushioning material around the eye-pieces
Peri-orbital haematoma	transmission of collision forces to the orbit via stiff goggle frames

Box 1

erosion has been caused by 'anti-mist' solution applied to the eye pieces.⁵ This new injury which we term 'purpura gogglorum' has not been reported before.

Suction purpura due to local mechanical causes are common in children, but their aetiology may not be recognised, leading to unnecessary worry and investigation.⁶ Swimming goggles may improve underwater vision and prevent ocular irritation and conjunctivitis, but careful usage is important to prevent associated injury. Appropriate tightening of the head band is essential such that the cushion seals around the eyes are functional without placing excess pressure on the soft tissues; some manufacturers advise application to allow 'soft suction' on the eyes. Goggles with

Safety features to look for in swimming goggles

- clearly marked caution notices regarding safe usage and removal
- hypo-allergenic cushion seals
- low-elasticity straps
- soft flexible one-piece frame
- shatterproof lenses
- anti-fog lenses

Box 2

poorly functioning seals should be thrown away and not applied more tightly. In 1977, Jonasson¹ and Lamb⁷ called for swimming goggles to be redesigned with less elastic straps, and the Royal Life Saving Society were actively discouraging the use of swimming goggles by children because of reports of injuries to the globe and bony orbit caused by collision with other swimmers, or the pool sides.⁸ However, the noxious nature of the water in many of our swimming pools make eye protection necessary, and swimming goggles are not only appropriate, but probably medically desirable. Whilst some manufacturers have improved design and labelling, poor quality goggles are still available and being worn. If our children need to wear swimming goggles, they should be of good design (box 2), and we as parents should be aware of the potential dangers during use. We need to educate our children on the proper use of swimming goggles, and we would advise that the equipment be checked before each lesson for fit and faults to prevent some of the ocular injuries mentioned here.

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