# Safeguarding against potential injury from an eye drops bottle

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## SUMMARY

**We describe a potential cause of eye injury, its concerns and ways to prevent it. The first author underwent a left cataract operation and was prescribed eye drops postoperatively. While applying one of the eye drops, he felt an object hitting the lower eyelid. A serrated plastic piece had fallen off the bottle. Had it fallen on the operated site, it might have caused serious untoward complications. Nurses, carers and patients need to be educated to remove the serrated piece from the bottle before applying eye drops. Manufacturers of eye drops should design safer bottles without such serrated pieces to prevent such eye injuries.**

## INTRODUCTION

Cataract surgery is one of the most commonly performed eye surgeries. Cataract is one of the world's leading causes of treatable blindness in the elderly. Cataract surgery is a relative core procedure with minimal risk and complications post-operatively, provided patients are selected appropriately and the procedure is carried out carefully.[1] Postoperatively, patients are given a range of eye drops for a few weeks. Either patients themselves or their caretakers instil the eye drops.[2] Issues with the instillation of eye drops impede their successful administration and may lead to untoward consequences.[2-4] We describe a potentially serious cause of eye injury due to a serrated cover of a plastic eye drops bottle.

The first author underwent left eye cataract surgery. Post-operatively, the nurse explained the different types of eye drops to be instilled. She also gave an educational pamphlet on the precautions to be taken for a few weeks postoperatively. While instilling drops from one of the bottles, the author felt an object hitting the lower eyelid, and it subsequently fell on the floor. The author was aware that he should not rub the eye. No injury was sustained.

On further investigation, a serrated piece of the plastic bottle cover had fallen off the bottle (Figure 1). It would have remained on the bottle after the seal was broken.

Had it fallen on the cornea or conjunctiva of the operated eye, it would have caused intense itching and rubbing of the eye. This could cause abrasion of the skin or conjunctiva, leading to introduction of infection at the operated site. Staphylococcus epidermidis, which is found in normal eyelid skin and conjunctiva, is the most common infecting microorganism in this instance.[1,5] Infection has been identified as an important factor causing endophthalmitis, the most feared complication of intraocular surgery. Based on 7-year data from the Malaysian Ministry of Health Cataract Surgery Registry (MOH CSR), the incidence of post-operative endophthalmitis (POE) was 0.08% (131/163,503).6 Issues

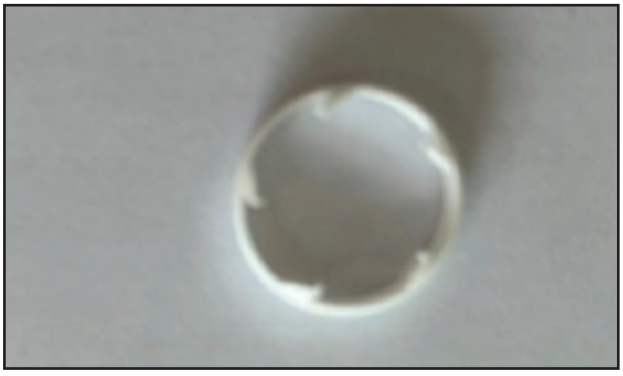

**Fig. 1:** Serrated piece of the plastic seal of the eyedrops bottle.


**Fig. 2:** Bottle with serrated piece.

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encountered while instilling the eye drops such as difficulty in squeezing or opening the bottle and lack of a partner or carer are factors that may decrease the compliance to ocular eye drops.[2,3,7,8] The potential risk of injury may further augment this issue.

If the serrated piece was routinely removed from the bottle after the seal was broken, this incident would not have happened (Figure 2). Nurses and patients alike may not be aware of the intricacies of the plastic bottles and its seal. Ocular surface injuries have been reported with eye drops bottle tips while instilling ocular medications.[2,3,7,9]

In this instance, the manufacturer was notified of the incident and injury risk. The manufacturer initially replied that they would investigate the incident. Subsequently, they replied that no similar complaint was reported earlier. They had also performed 'in-process functionality test' on eight samples. No deviations were reported, and no material deviations were reported for the cap and bottle. Obviously, these tests were carried out by informed personnel who knew that the serrated piece had to be removed. We contend that if a large number of patients were observed while opening the bottle, some would 'forget' to remove the serrated piece. A majority of the elderly would need cataract surgery at some point in their lives and almost all patients with eye conditions need some sort of drops for treatment. Hence, we deduce that a large number of patients would be exposed to such bottles with serrated pieces. Even if a small proportion of these patients do not follow the exact procedure, there would be a considerable number of patients who are needlessly exposed to the risk of injury.

The most effective way to reduce the potential for such injuries is the use of safer plastic bottles without such serrated pieces. While manufacturers take care of this issue, such bottles with serrated pieces will still exist in the market. Healthcare personnel and patients should be educated on risks and potential injuries with the use of eye drops with serrated seals. Nurses and pharmacists could demonstrate the first application of the eye drops with emphasis on removing such pieces before use.

We suggest widespread education of health care personnel (doctors, nurses, pharmacists, etc) and patients through a step-by-step, clear, instructional video to increase the safety of use of eye drops and overall compliance.

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