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EQUIPMENT REVIEW

Eye irrigating lenses

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Treatment of chemical burns requires rapid dilution of the chemical, decreasing eye exposure to the toxic material. Prolonged exposure to the chemicals can lead to decreased visual acuity, and even loss of the eye (Pfister, 1983).

Highly caustic compounds can be found in industry and agriculture, as well as at home (Duane, 1981). Alkalies are usually more damaging than acids, due to rapid penetration into tissues from liquefaction necrosis. In the emergency room both types of burns are treated similarly, with immediate copious irrigation of the eye. Often, this will be critical in preventing serious eye damage.

Until the 1960's eye irrigation required a physician or nurse to hold intravenous tubing over the injured site, to ensure complete eye irrigation (Born, 1983). This was cumbersome and time consuming.

In 1969 Dr L. B. Morgan, an ophthalmologist, developed the eye irrigating scleral lens for the treatment of eye infections, and this is now used also for chemical burns and nonembedded foreign bodies (Morgan, 1971).

The scleral lens is used in five out of eight emergency rooms in the United States (Poe, 1990), as well as many industrial sites.

Technique. Topical anaesthetic is placed on the cornea. The intravenous solution set is attached to the lens. The patient is asked to look down, when the lens is inserted under the upper eyelid. When the patient looks up, the lower eyelid is retracted, and released over the lens (Brunner, 1975) (Fig. 1).

The intravenous flow is adjusted as desired. With chemical injuries this involves rapid irrigation with 500 cc or more of Ringer's lactate or normal saline solution.

Complications. The eye irrigating lens has been used for non-embedded foreign bodies. Concern has been expressed that foreign bodies that are not visible may abrade the cornea with pressure from the scleral lens.

Poor technique in insertion of the lens may also cause corneal abrasions.

Finally, poor insertion technique could potentially introduce infectious agents to the conjunctiva from the health provider.

Equipment. Various eye irrigating lenses have been developed. One example is

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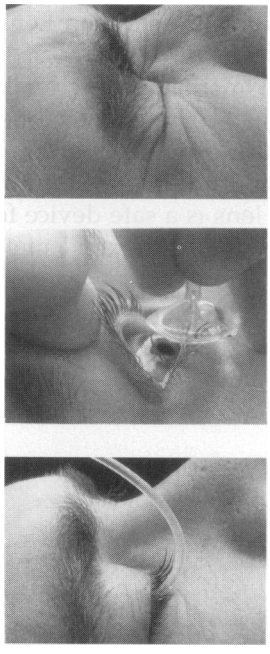

Fig. 1 Technique for insertion of Morgan Lens (Photographs courtesy of MorTan, Inc.)

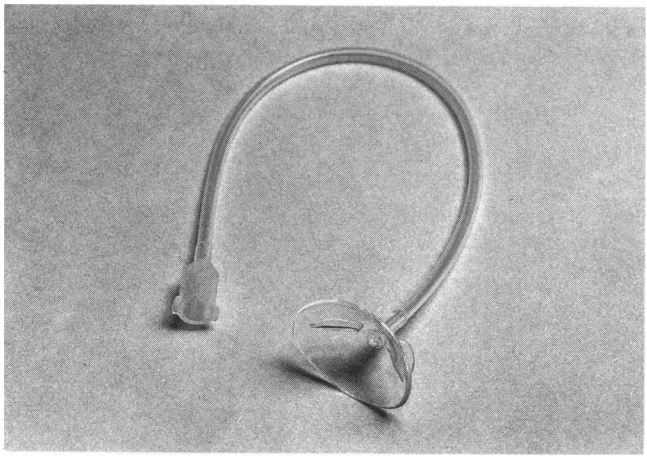

Fig. 2 The Morgan Therapeutic Lens

the Oklahoma Eye Irrigating Tube, with a perforated silicone tube shaped to fit into the conjunctival fornices. Another example is a thin polyethylene tube that is inserted percutaneously into the conjunctival fornix (Duane, 1981).

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The most popular device used is the Morgan Lens (MorTan Inc., P.O. Box 3478, Missoula, MT 59806).

This consists of a polymethylmethacrylate scleral lens with an attached flexible perfusion tube (Fig. 2). The lens separates the cornea and bulbar conjunctiva from the palpebral conjunctiva. It also provides multidirectional flow of irrigating fluid into the cul-de-sac, which would otherwise be untreated.

Summary. The eye irrigating lens is a safe device for lavage of the eye exposed to chemical insult. It provides an easy and rapid method to decrease the morbidity from chemical injury.

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