

Moisture Chamber Spectacles

A Practical Guide to Their Construction

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• We made a moisture chamber spectacle to treat severely dry eyes. The appliance has been uniformly successful, even in cases refractory to other forms of treatment.

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Spectacles with moisture chambers attached have been tried in the treatment of dry eyes for many years. Unfortunately, such appliances have met with infrequent success. Over the past year we have developed a custom-fitted spectacle moisture chamber that has been uniformly successful in the treatment of even the most refractory cases of dry eye syndrome. This article describes step by step the method for producing such apparatus. Generally, two sittings are necessary to fit the moisture chambers.

MATERIALS AND METHODS

The patient chooses a pair of spectacle frames. These should be comfortable and properly fitted, so they do not slide down the nose. Plastic frames with wide rims are preferable, because they give a broad area for attachment of the moisture chambers. With dark-colored frames the moisture chamber is less obvious. The moisture chamber is fashioned from sheets of dental wax to create a template. The wax is

applied to the frames and shaped exactly to fit the periorbital skin without pressing. Areas where wax touches skin should be carefully flanged to provide a broad base. Thus, an airtight seal can be created without sharp edges pressing into tissues (Fig 1).

The outer surface of the wax template is

sprayed with dental fixative. A thin layer of dental alginate is applied with a spatula to the flanged surface of the wax. With the patient wearing this ensemble, additional alginate may be syringed onto the edges to fill any remaining spaces (Fig 2). After the alginate sets, excess is trimmed from the inside surface of the template.

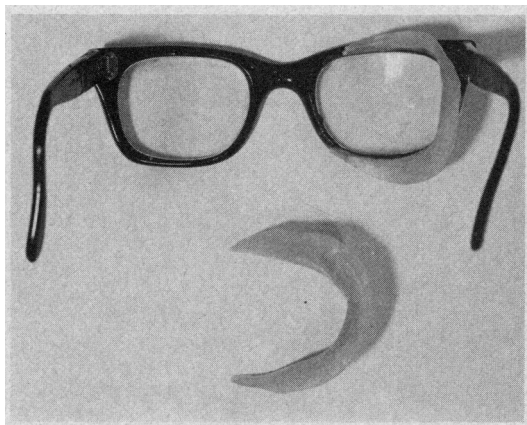


Fig 1.—Template for moisture chamber fashioned from sheets of dental wax. Edge is flanged so as not to press into skin.



Fig 2.—Precise fit obtained by syringing alginate onto area where template touches skin.

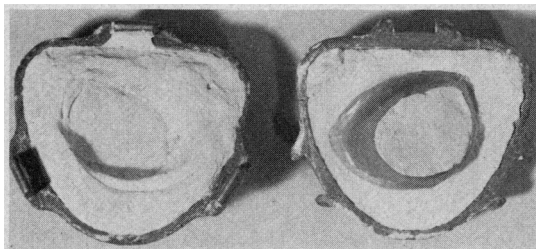


Fig 3.—Impression of wax template taken in stone or plaster.

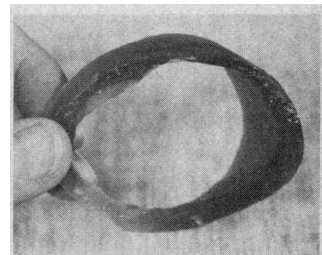


Fig 4.—Methylmethacrylate moisture chamber prior to attachment to spectacle frames.

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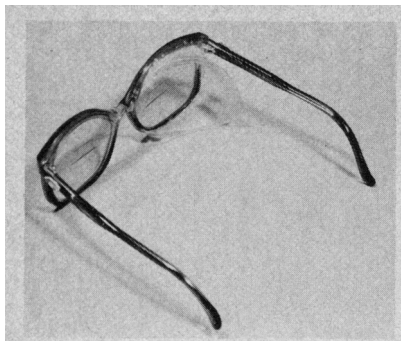


Fig 5.—Finished product, spectacle frames with moisture chamber attached.

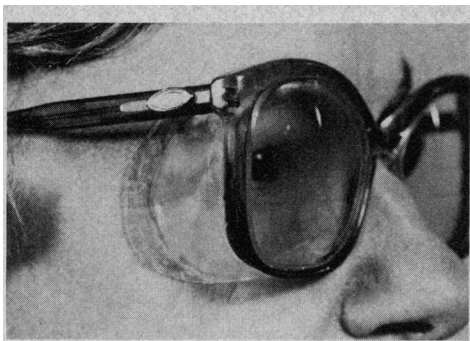


Fig 6.—Properly fitted, moisture chamber rests comfortably on patient's face, just touches skin all around, and exerts no pressure.

The wax template is removed from the spectacle frames, and an impression of it is taken in stone or plaster with use of the two halves of a dental mold (Fig 3).

After the wax is removed, oil is applied to the impression. The impressions are put in the two halves of a dental flask and used to create the moisture chamber, in the shape of the wax template, from liquid methylmethacrylate mixture. Ordinarily, this mixture is clear, but if the patient has complained of photophobia, a dark mixture may be substituted.

After the moisture chamber is cured, it is removed from the flask and trimmed and polished (Fig 4). The chamber is attached to the spectacle frames with a quick-cure acrylic (Fig 5). Properly fitted, the moisture chamber should rest comfortably on the patient's face, just touching the skin all the way around and exerting no pressure (Fig 6).

COMMENT

The successful treatment of the patient with dry eyes can be a perplexing and often frustrating problem for the ophthalmologist.¹⁻³ The routine use of tear substitutes in liquid or ointment form is helpful in cases of relatively mild involvement, or when the patient is cooperative and highly motivated. There remains, however, a group of patients who, due to age or infirmity and the severity of

their disease, can benefit little from such topical measures. In such cases of "bone dry" eyes, the survival of the cornea is clearly at risk.⁴

Over the years, reports of mechanical methods of humidifying the chronically dry cornea have appeared sporadically. These have included spectacle mounted tear tanks,^{5,6} tear pumps carried in the pocket,⁷ swimmers' goggles,⁸ soft contact lenses, scleral lenses,⁹ and surgical transplantation of Stensen's duct.¹⁰ A goggle-type apparatus would avoid corneal drying by decreasing the rate of evaporation from the surface of the cornea. Since goggles rely primarily on pres-

sure to maintain a close fit, compression of adnexal structures occurs and results in discomfort except in the most temporary applications. Shaping the sidewalls to fit flush against the patient's face all the way around and creating a flanged edge to give a wide arc of contact insures an airtight and comfortable fit. Comfort is a major factor, especially when a moisture chamber is to be tolerated for long periods of time or by young children.¹¹

We have given moisture chamber spectacles to patients who were refractory to vigorous treatment with ocular lubricating drops. Of six patients so treated, all reported improvement in comfort with use of the spectacles. This was especially gratifying in the case of an elderly man with advanced mucous membrane pemphigoid. His condition had deteriorated to a stage where he kept his eyes closed virtually all the time. He was uncomfortable with his eyes open, even when using artificial tears at five-minute intervals. By using moisture chamber spectacles, aided by artificial tears every four hours, he was able to keep his eyes open and to enjoy television for the first time in years.

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