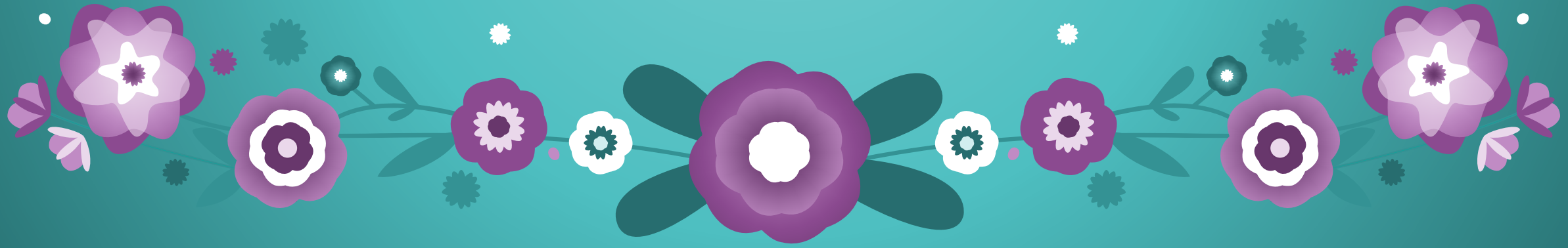
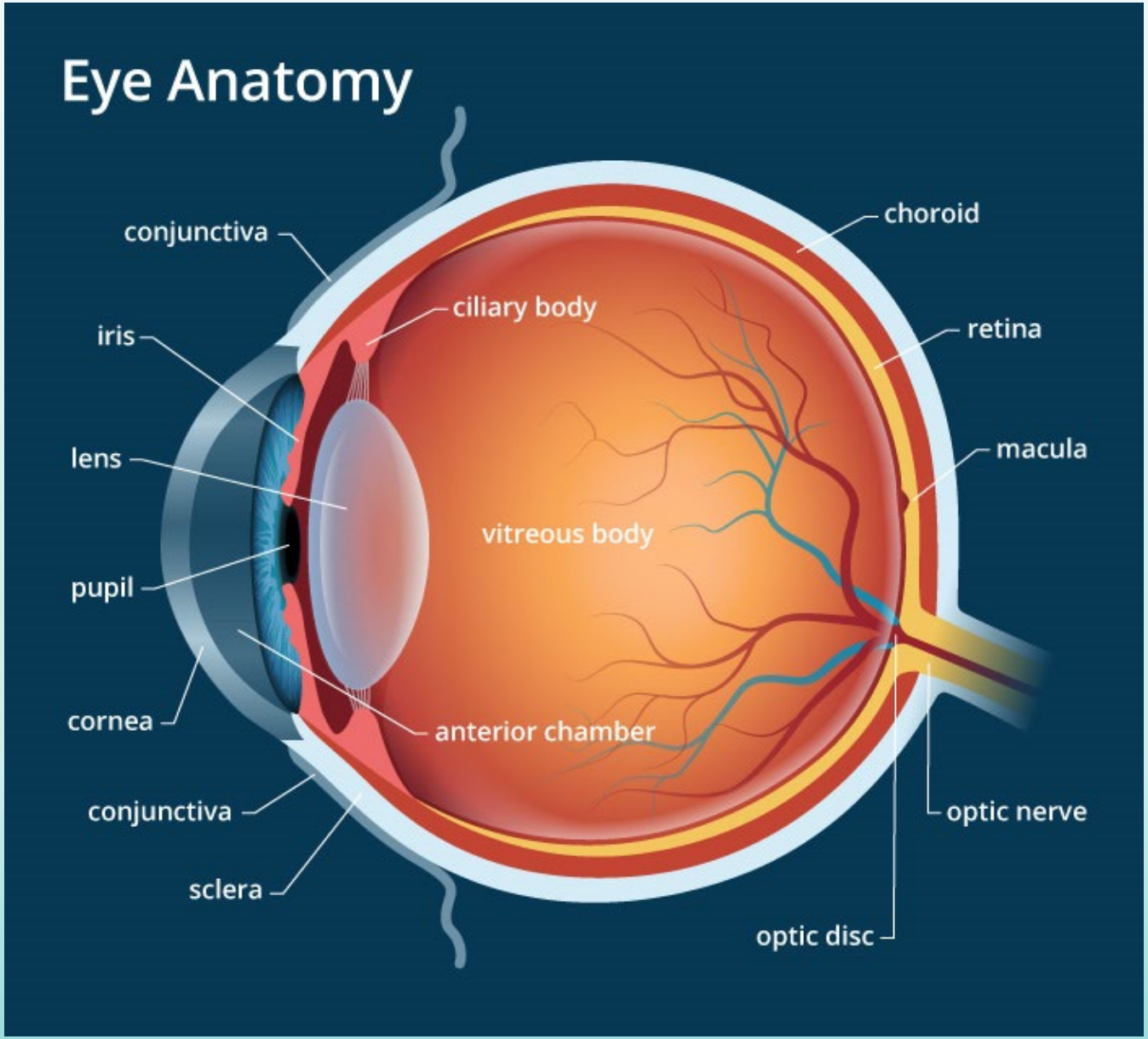
Fabrication of Custom Ocular Prostheses

Lect. Dr. Mustafa Saadi Ali

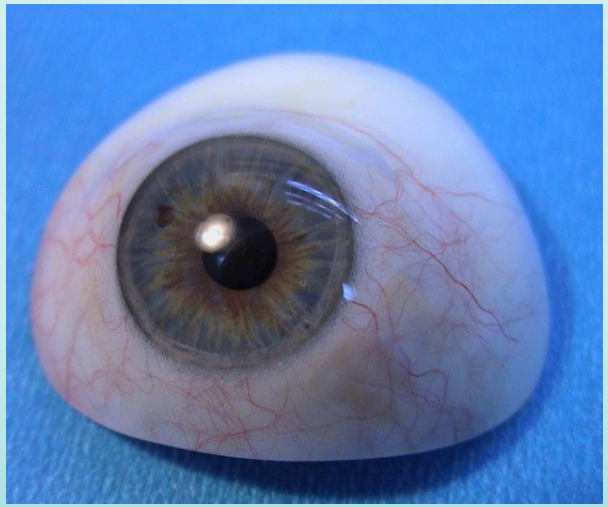


Introduction



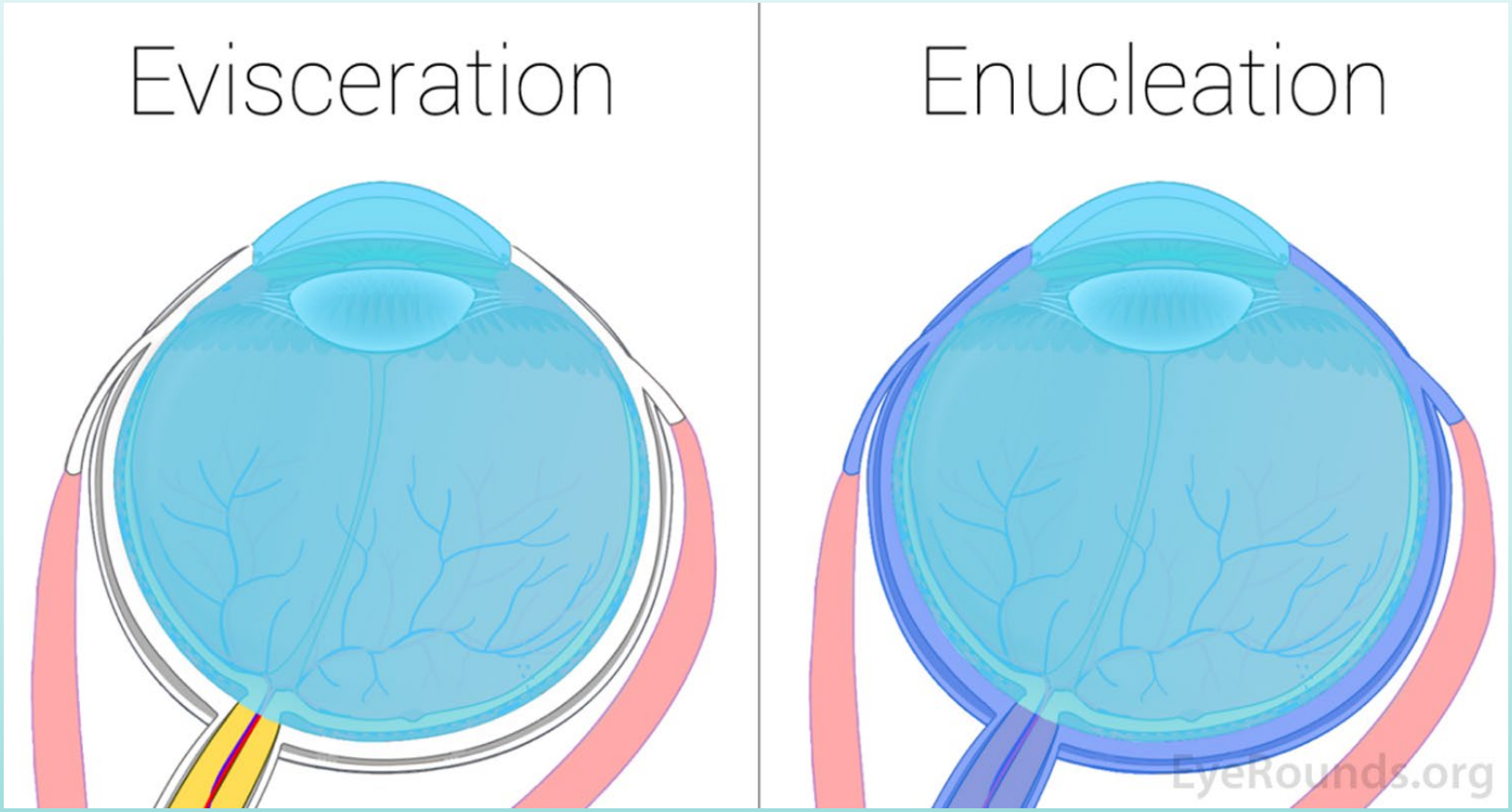
Introduction

Patients requiring treatment with custom ocular prostheses are those who have lost ocular structures through orbital evisceration or orbital enucleation.

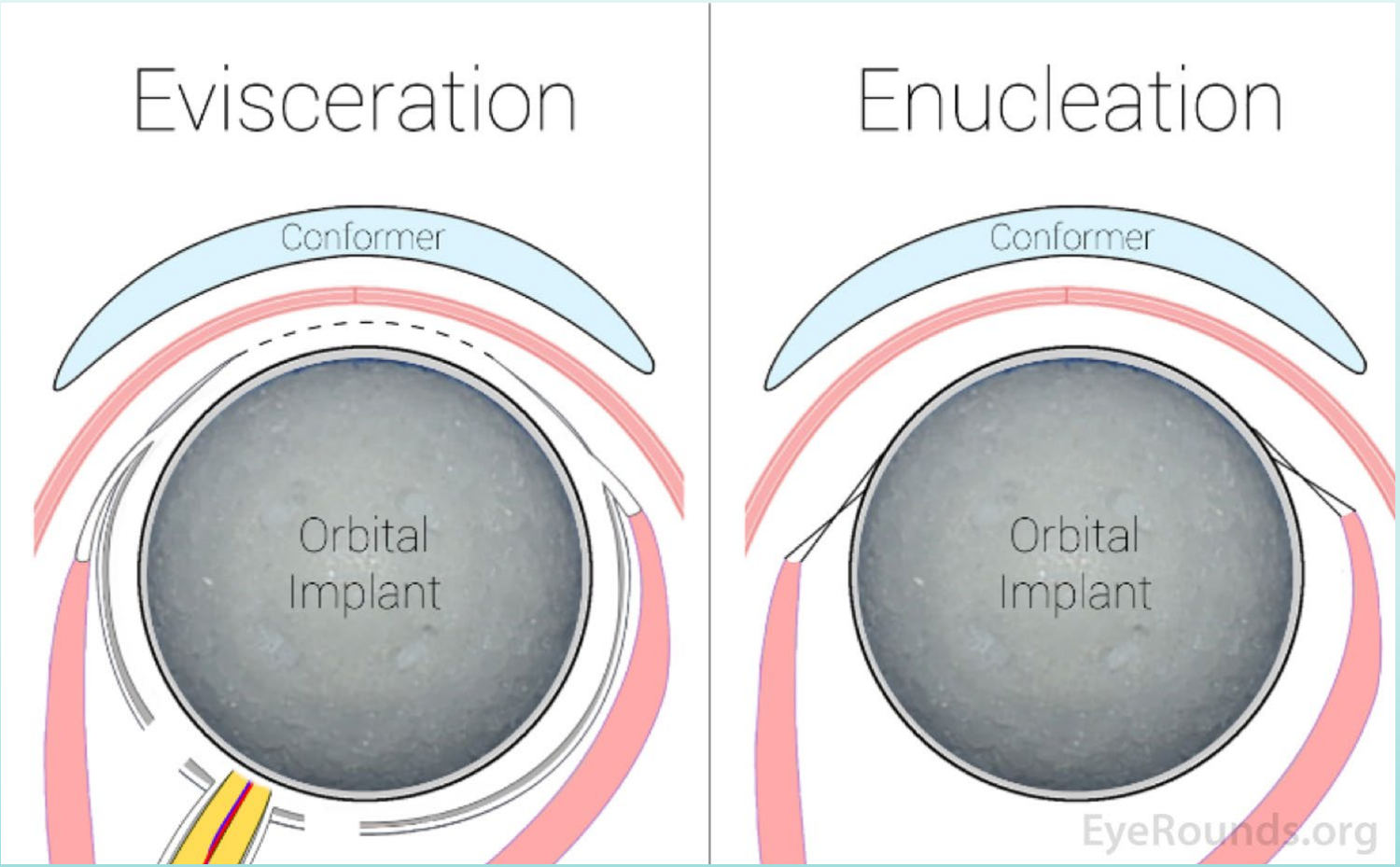


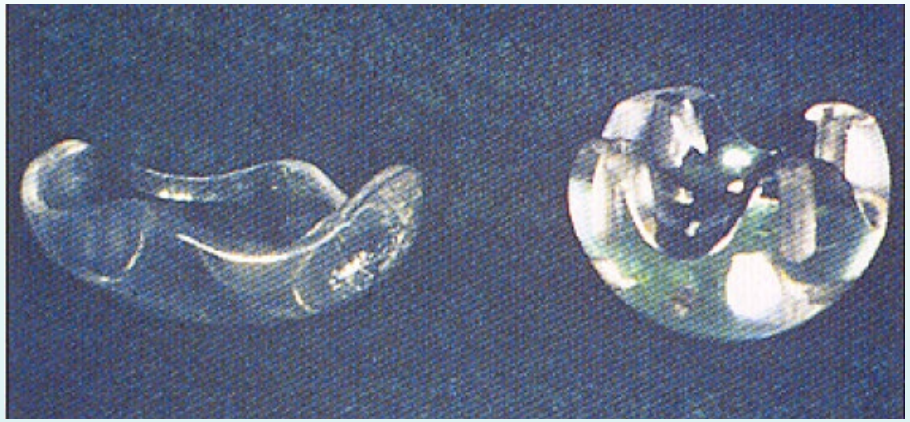
Evisceration is the removal of the contents of the globe, but leaving the sclera and on occasion the cornea in place.

Enucleation is the removal of the eyeball itself.



An orbital implant is used to replace lost tissue volume and improve prosthesis mobility. A plastic conformer is placed into the defect at time of surgery to serve as a surgical stent by maintaining tissues in place during healing and provide space for the planned ocular prosthesis

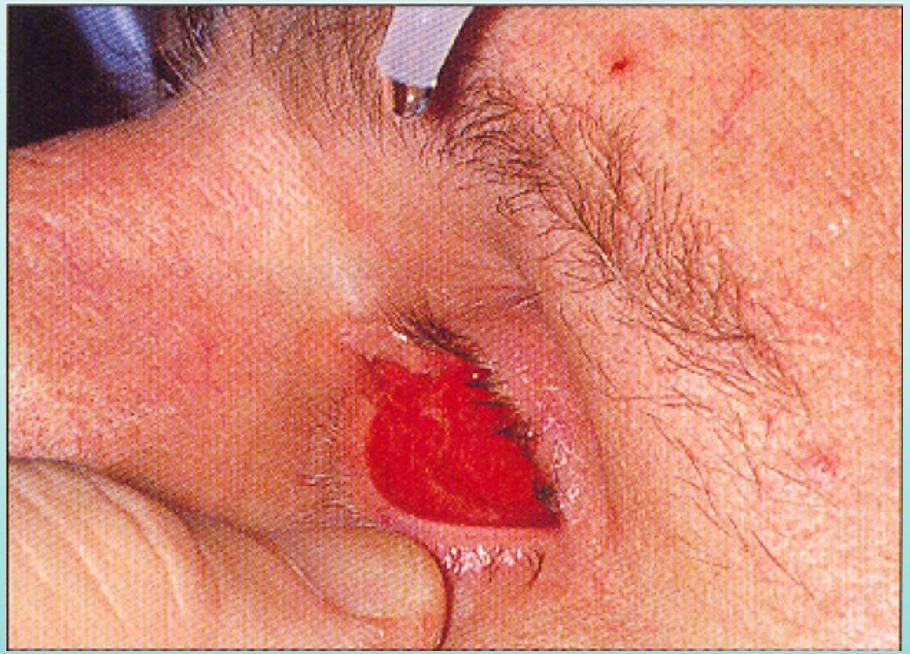




Impression and Wax Pattern Fabrication

When it has been determined that the patient is ready for treatment, the defect should be anesthetized with 0.5% tetracaine hydrochloride ophthalmic solution topical anesthetic to increase comfort during the impression procedure.

One or two drops of the solution should be placed onto the conjunctiva of the defect and allowed to take effect for about 15 minutes.



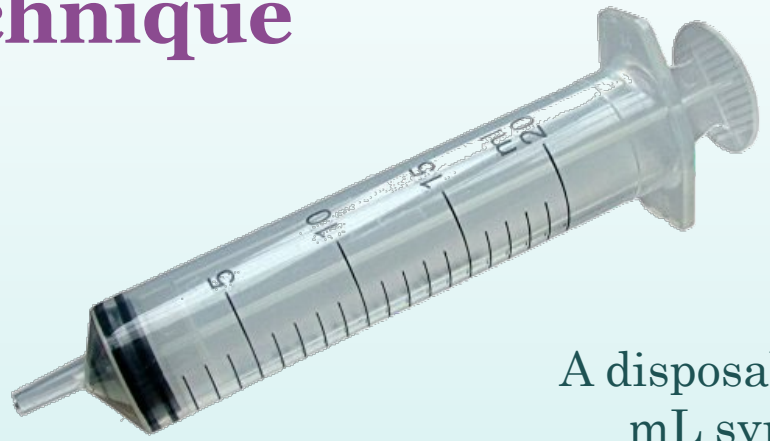
Impression and Wax Pattern Fabrication

Two impression techniques:

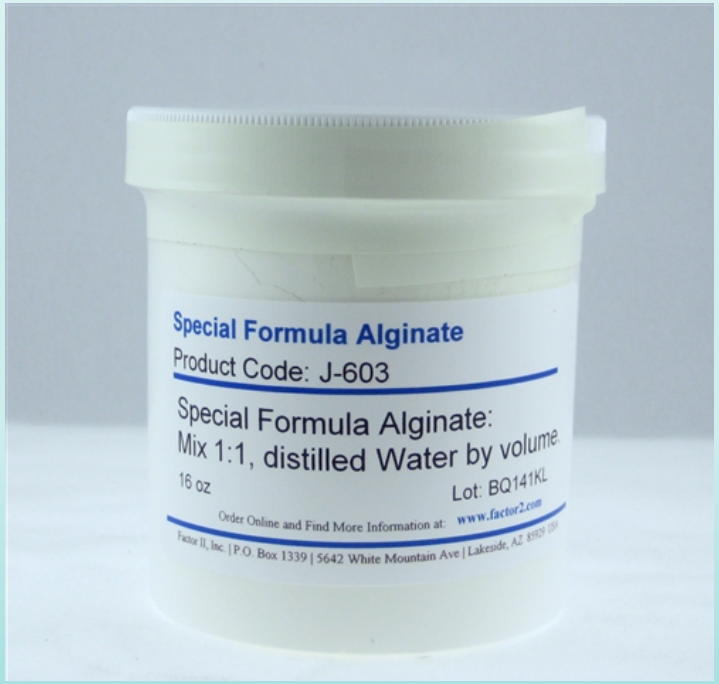
Stock ocular tray technique (Molded shell)	External tray technique
Utilizes a stock ocular impression tray and works well for the vast majority of surgical enucleation and surgical evisceration situations	Useful for patients with less desirable morphology of the defect, usually as a result of trauma, infections, or complications during healing, as there is no tray placed within the defect.

Stock Tray Impression Technique

A stock ocular tray



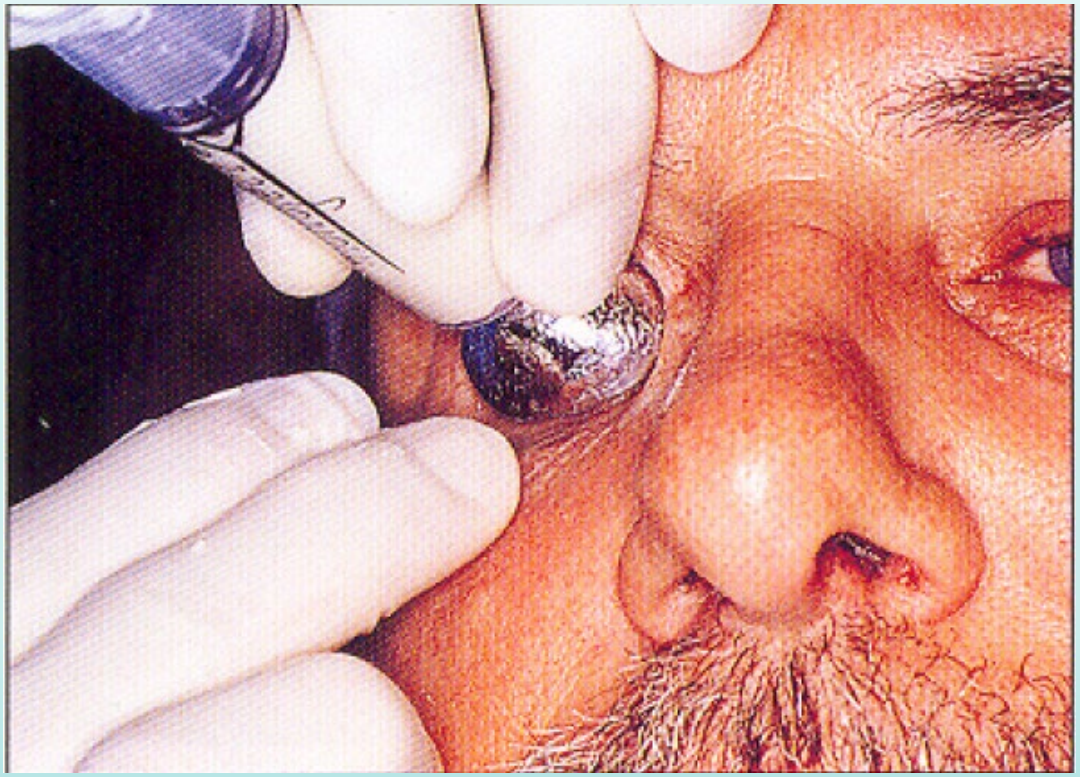
A disposable syringe (20-mL syringes, 1-mL graduations

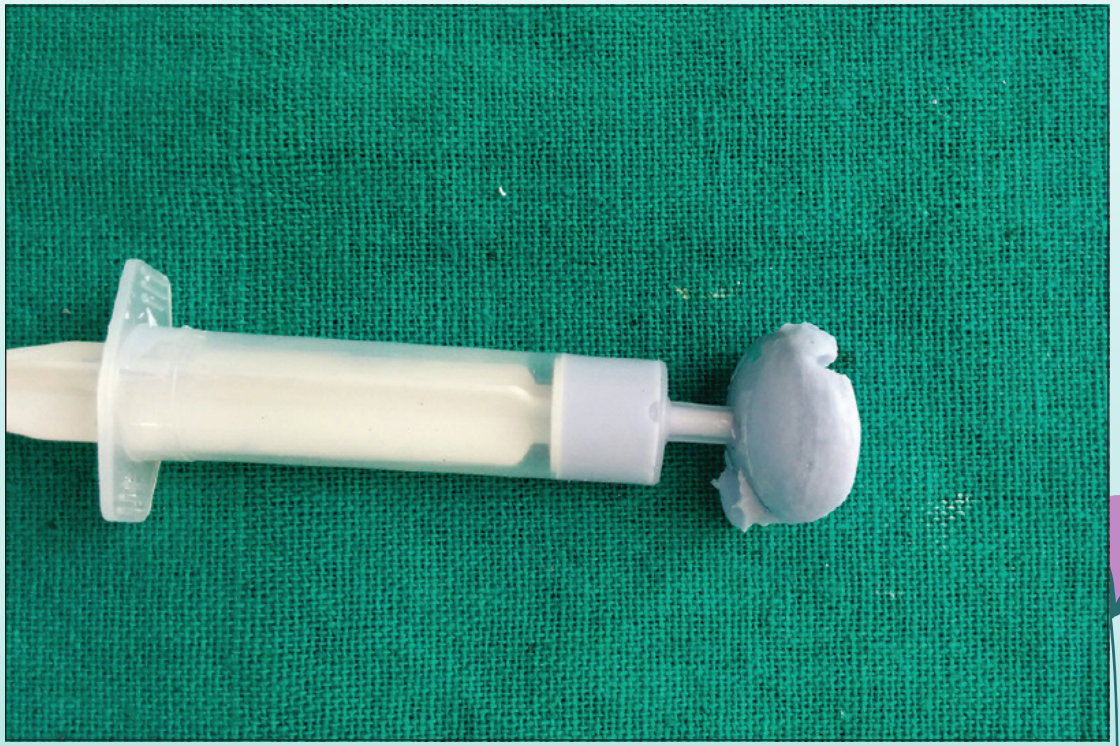


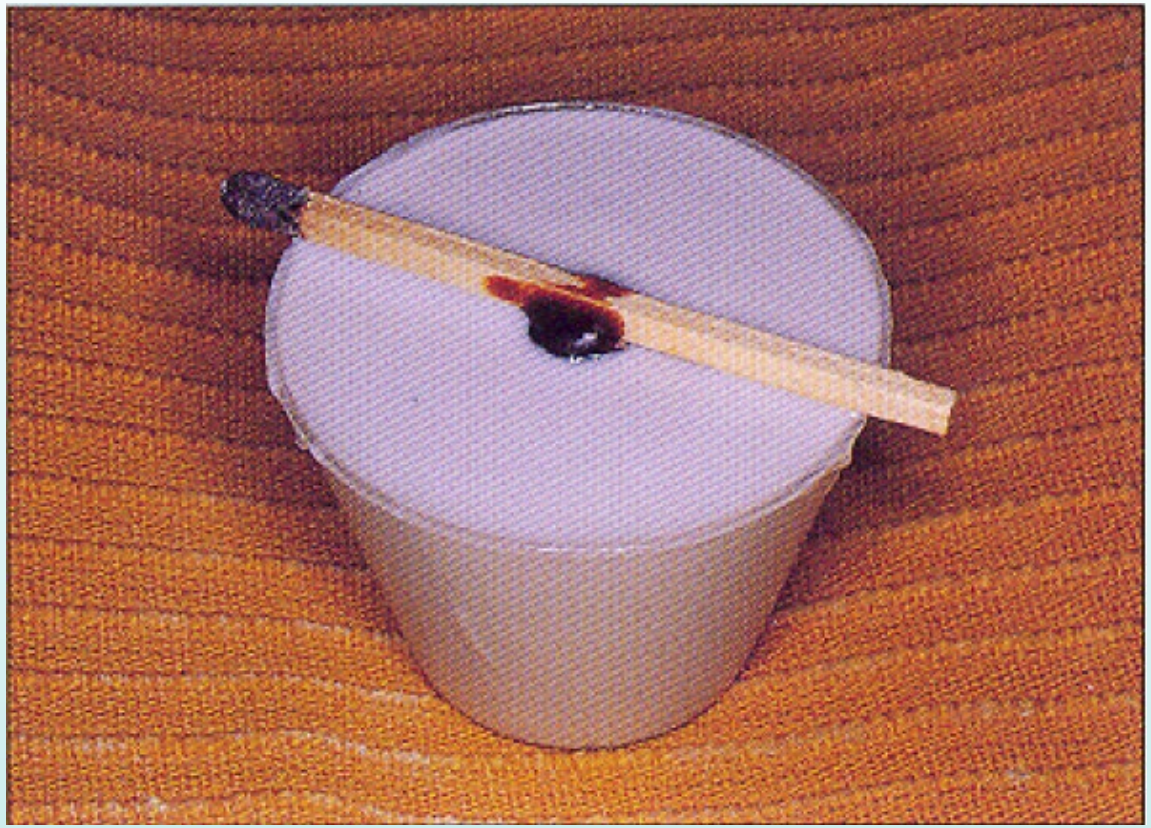
An ophthalmic-quality irreversible hydrocolloid.

Procedure

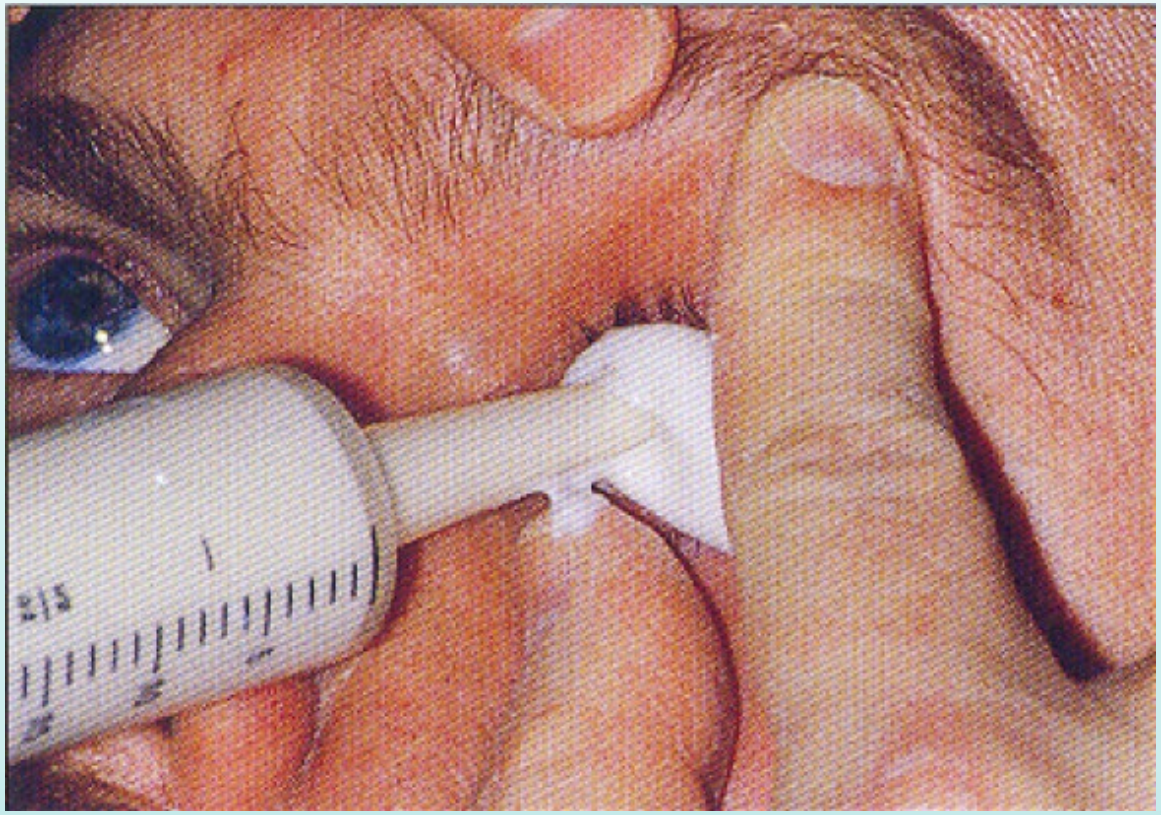
The patient should be seated in an upright position with the head supported by the headrest.



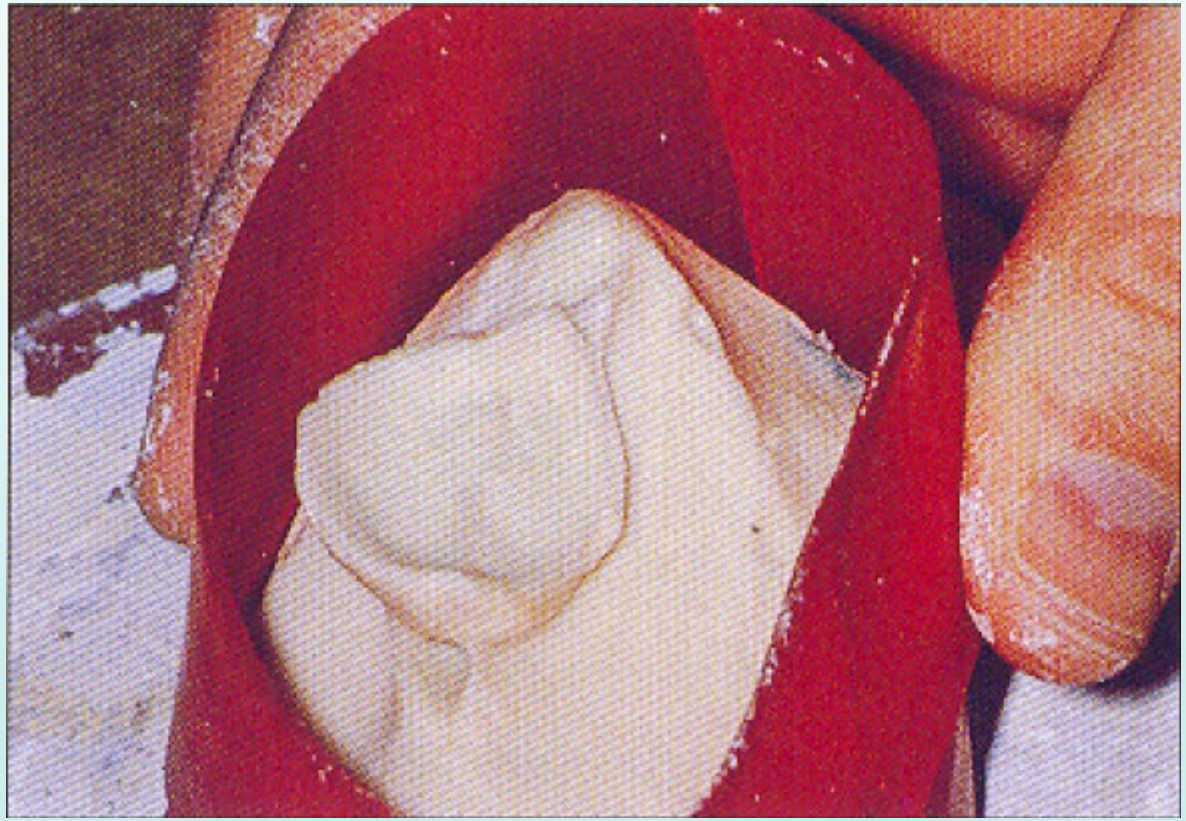




External Tray Impression Technique

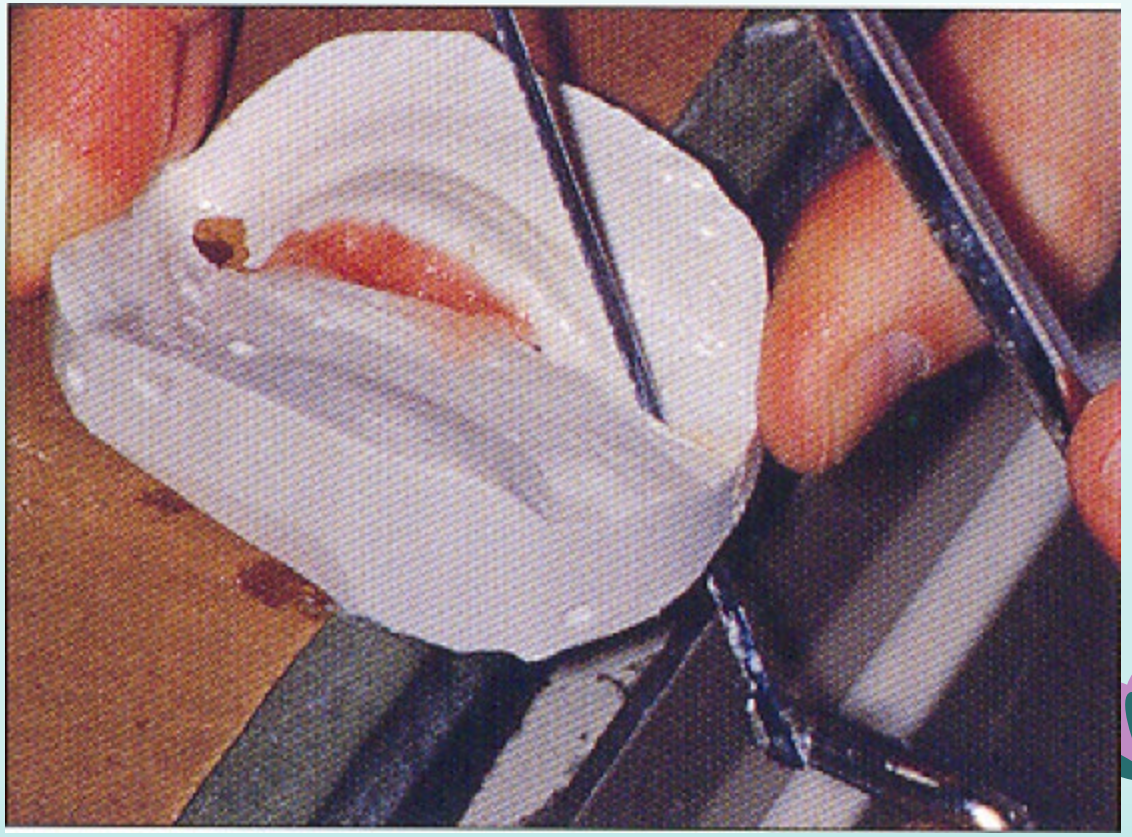


External Tray Impression Technique

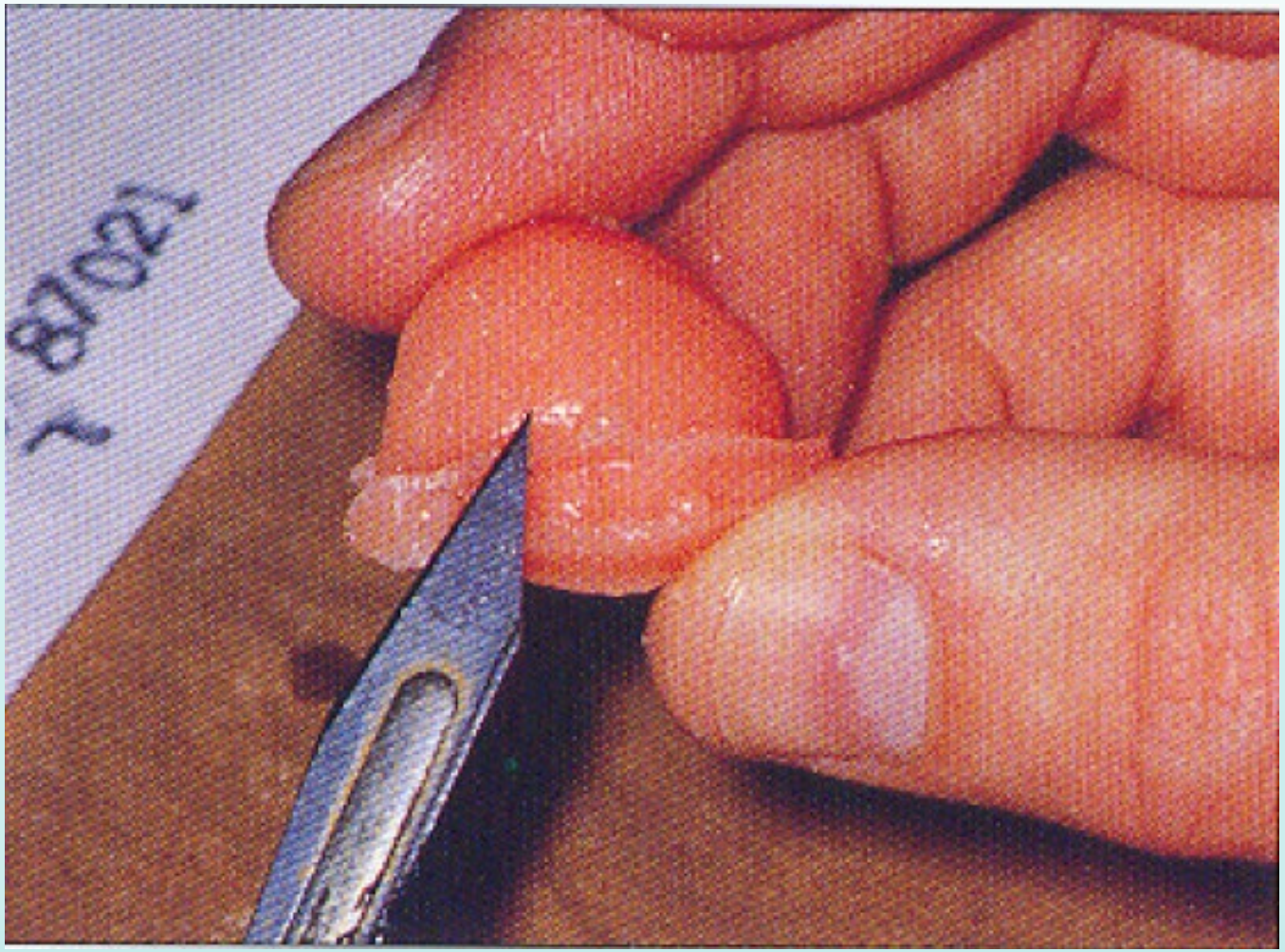


External Tray Impression Technique

Coating the defect tissue with mineral oil the defect site filled with molten baseplate wax



The cast is sectioned using coping saw



The sprue can be removed with a sharp scalpel and the anterior surface of the wax pattern smoothed with a flame

Fitting the Scleral Wax Pattern

The baseplate wax scleral pattern should be highly polished and free from dust, debris, and irritating chemicals before placing it in the ocular defect.

Custom Ocular Prosthesis Fabrication

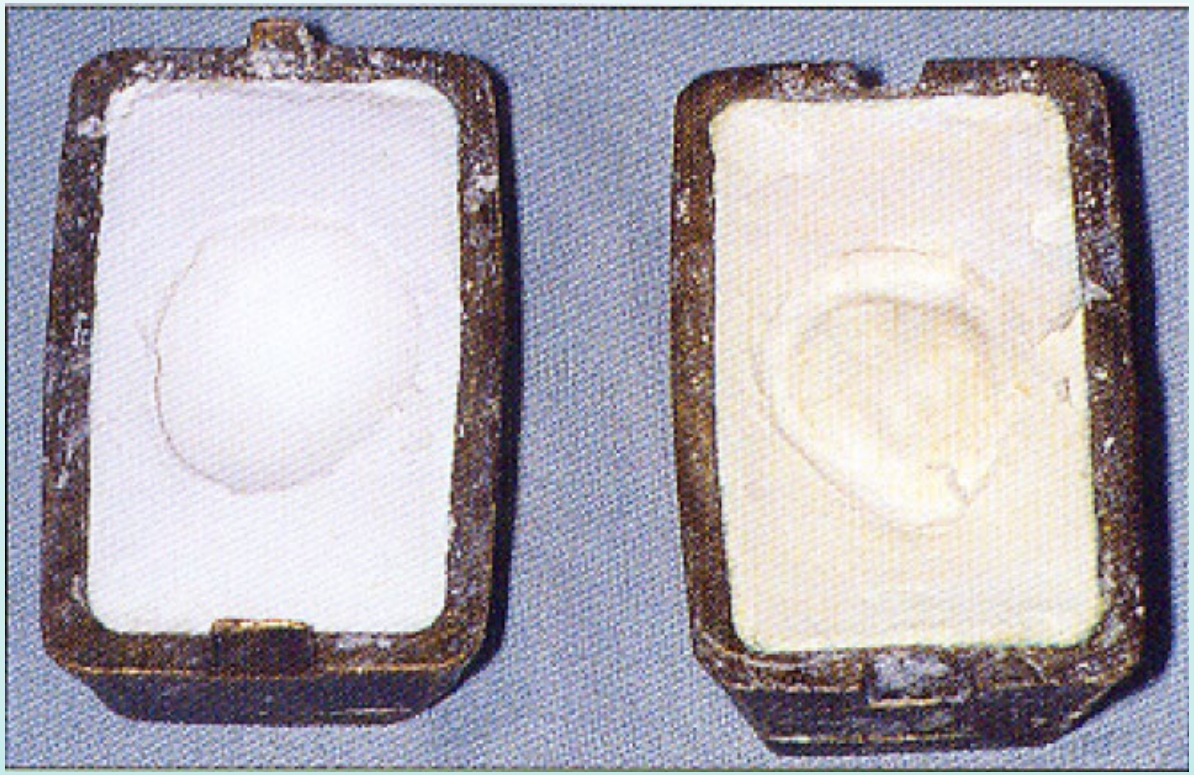
Paper Iris Disk Technique

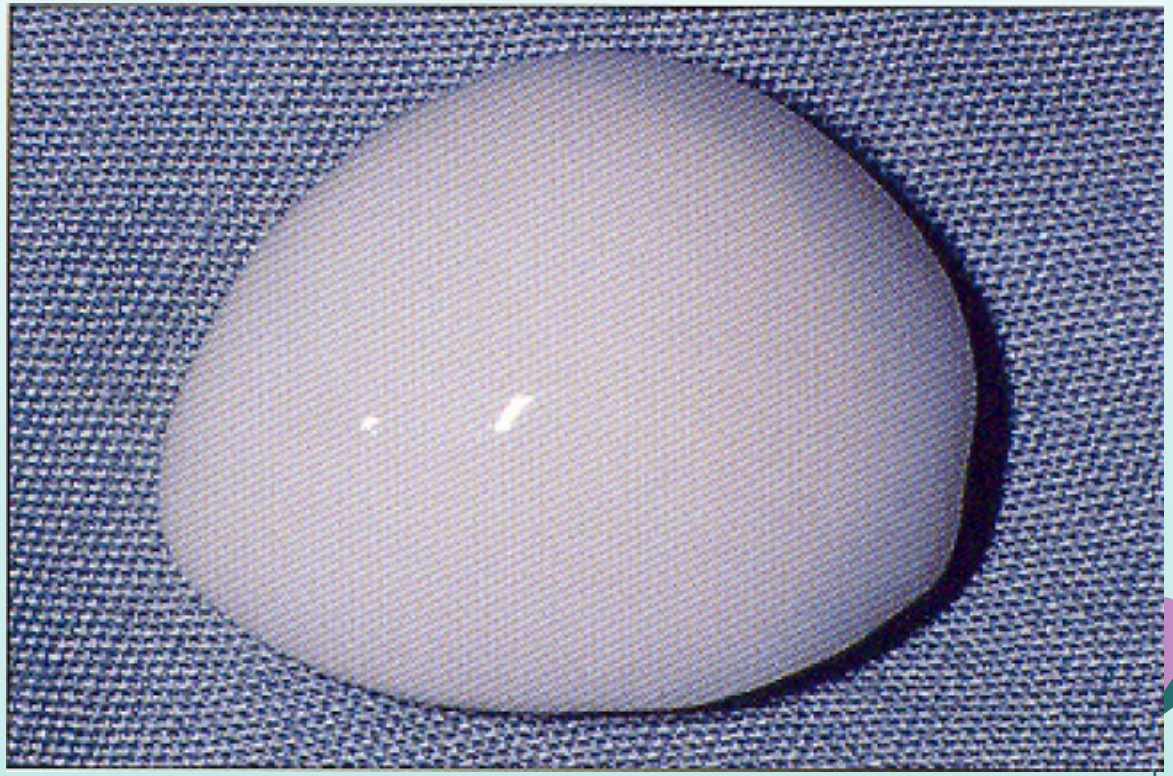
- utilizes readily available materials and techniques familiar to the dental office and allows almost limitless adjustment of coloration.

Black iris disk technique

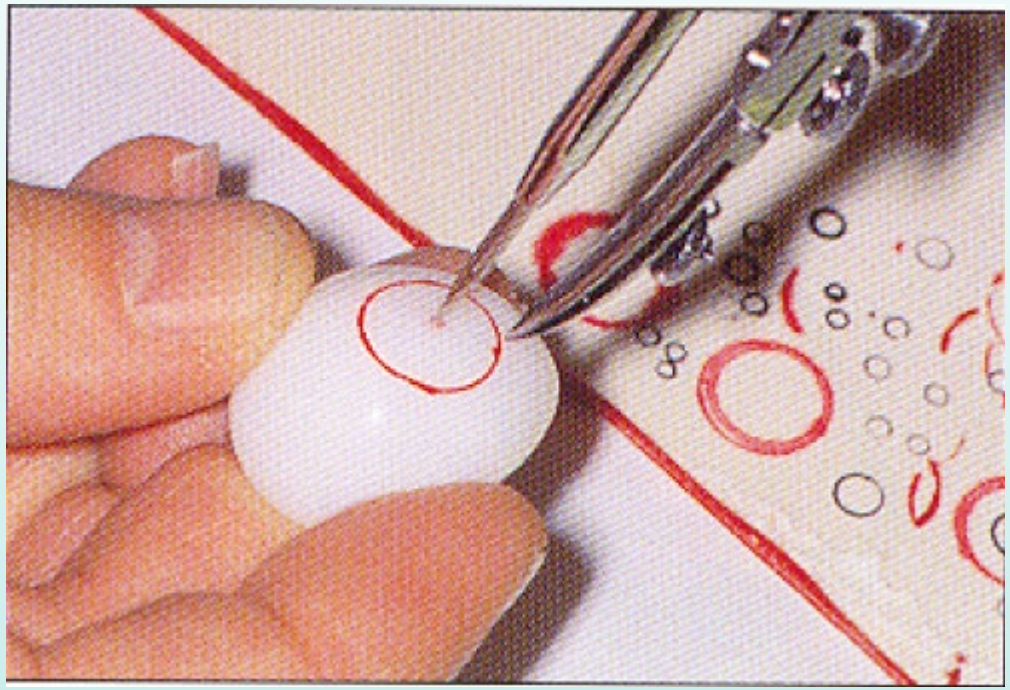
- requires significantly greater mastery of color matching and painting skills but produces a three-dimensional value to the resulting iris-lens assembly

Paper Iris Disk Technique

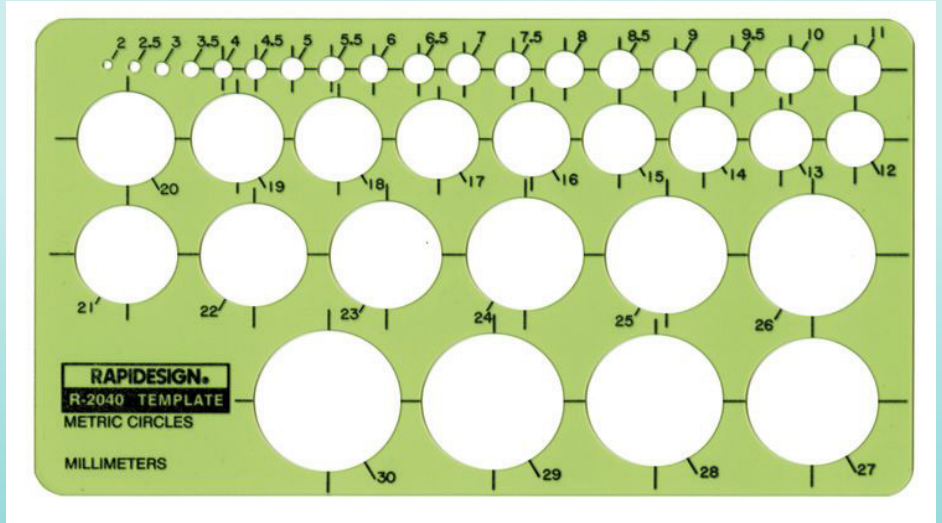




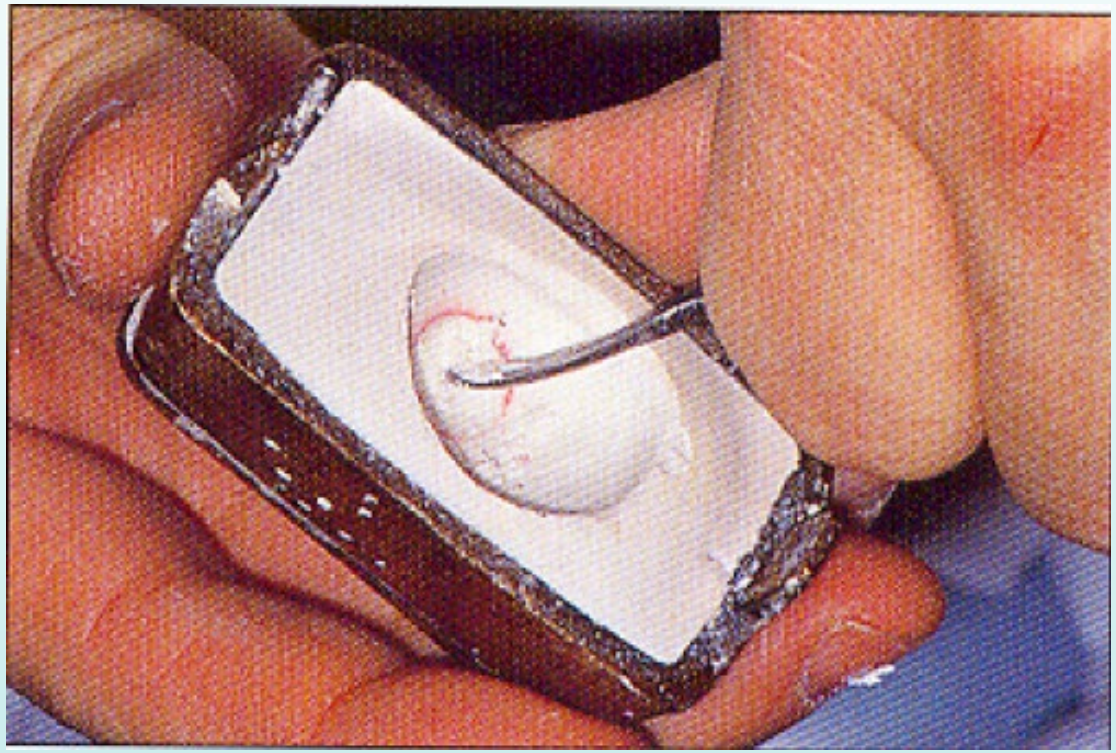
Paper Iris Disk Technique



Carmen red ink

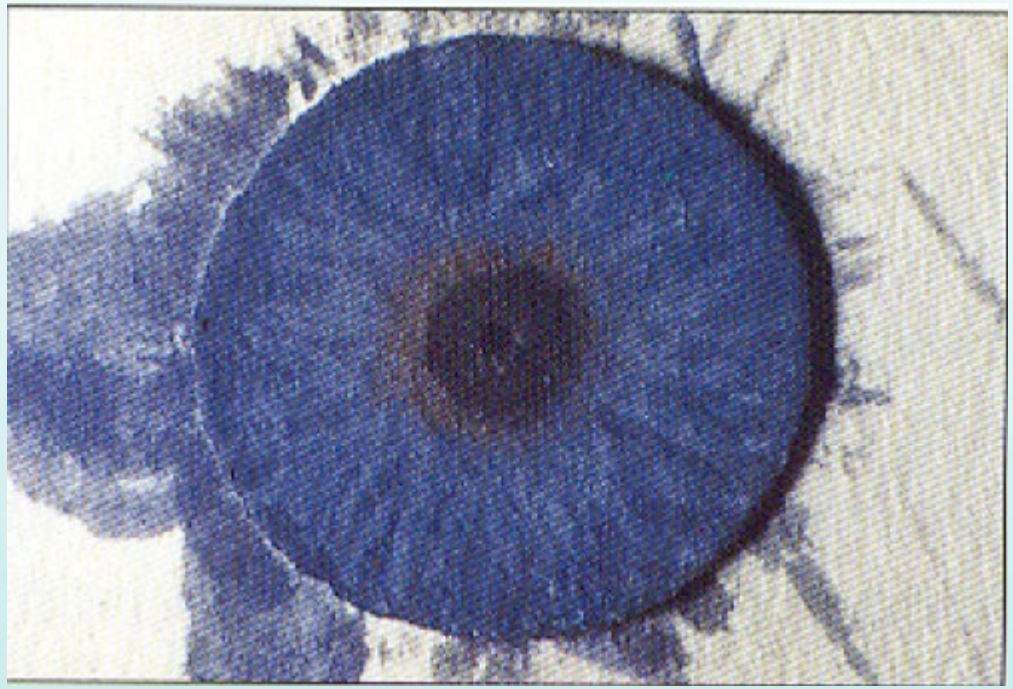


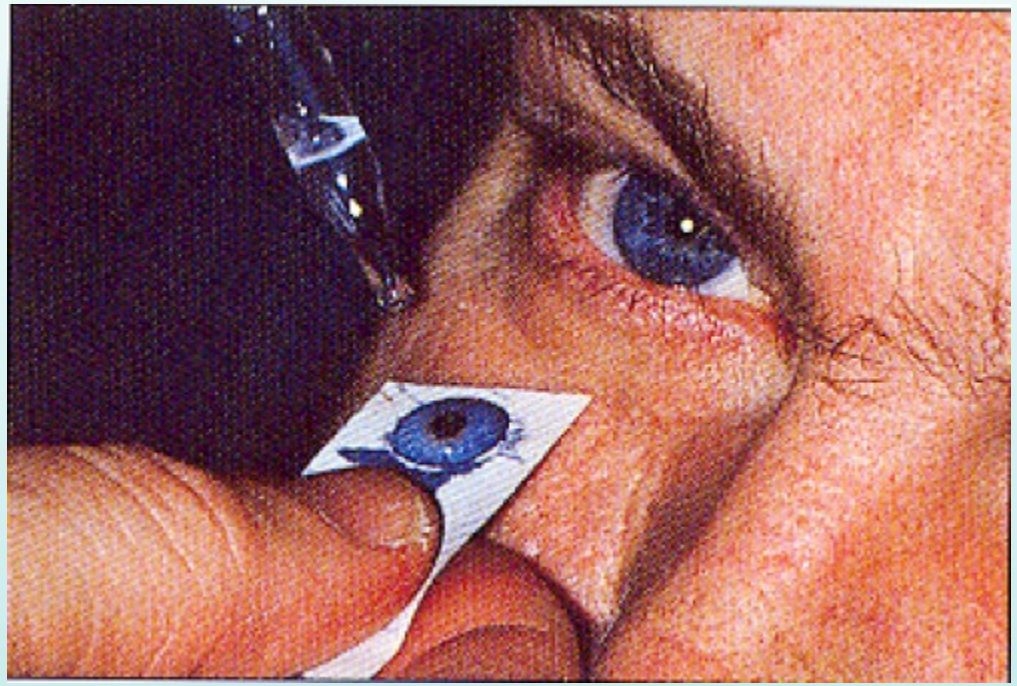
Paper Iris Disk Technique



A disk of ordinary artist's watercolor paper is punched out using a die. A selection should include 10 to 12 mm diameters in 0.5-mm increments. The size selected should be 1 mm smaller than the measured size of the iris because the corneal prominence will cause a slight magnification of the iris disk.

Paper Iris Disk Technique

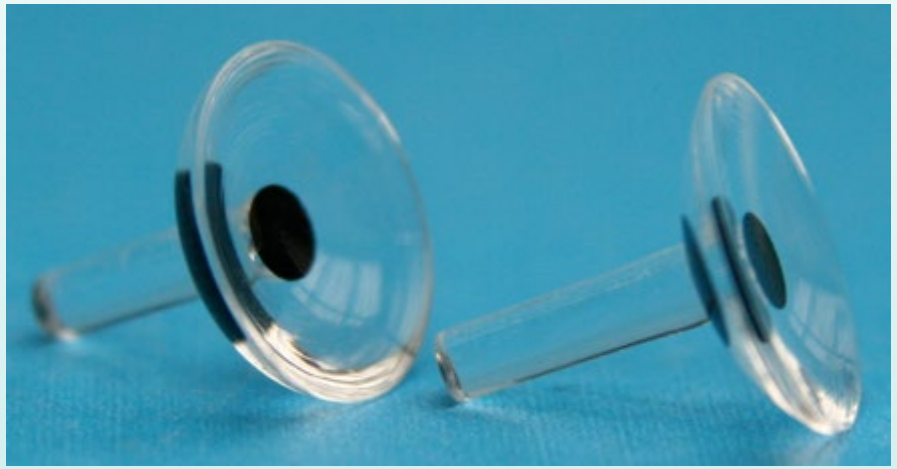


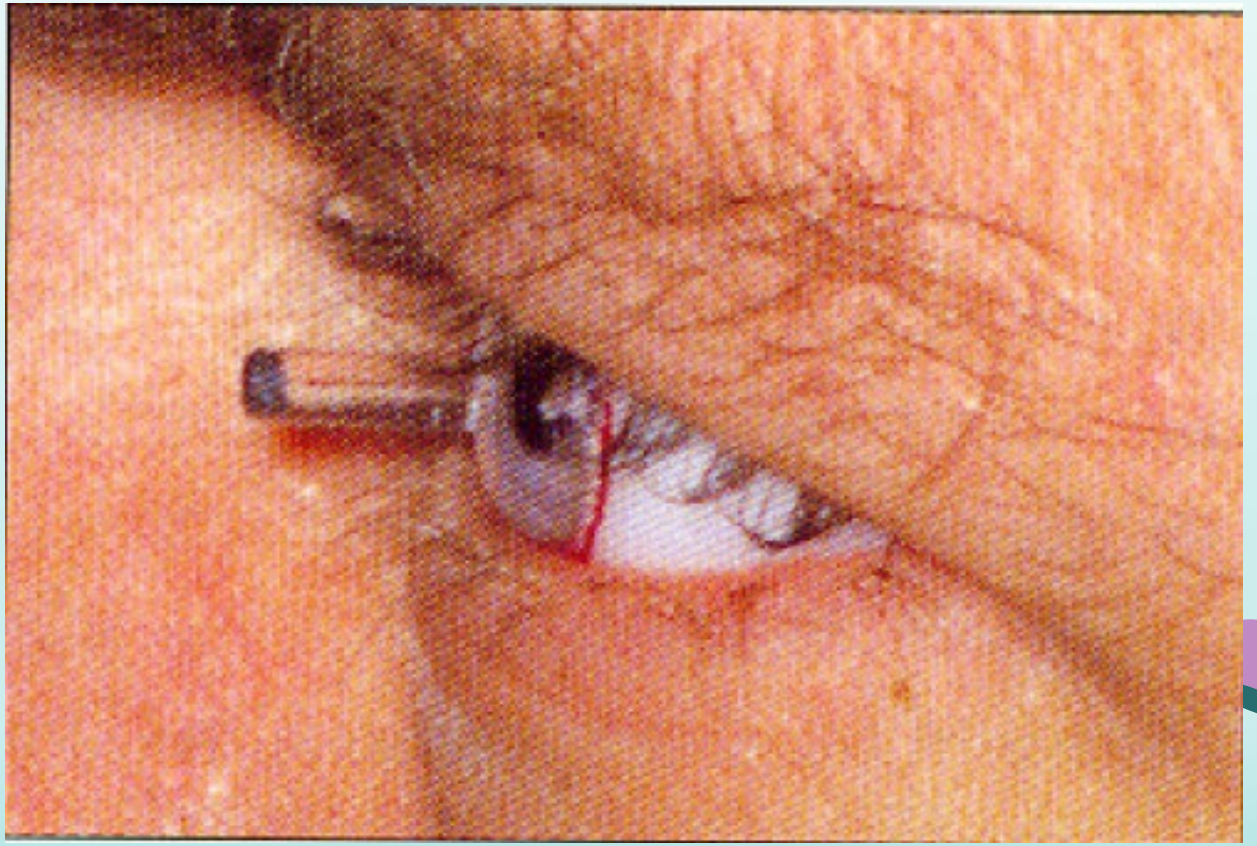


Using artist's acrylic paint, the disk is painted to match the coloration of the natural iris. The diameter should mimic the natural pupil under indoor lighting conditions.

A drop of water applied to create the magnification of the corneal prominence, and the color compared

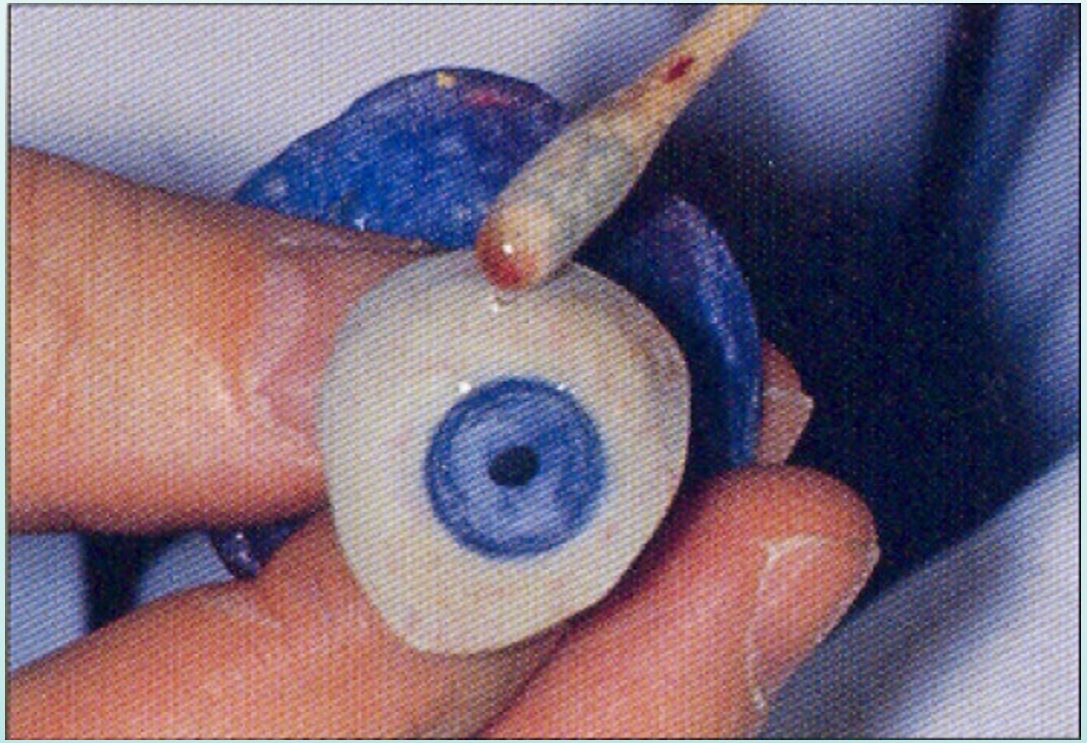
Paper Iris Disk Technique

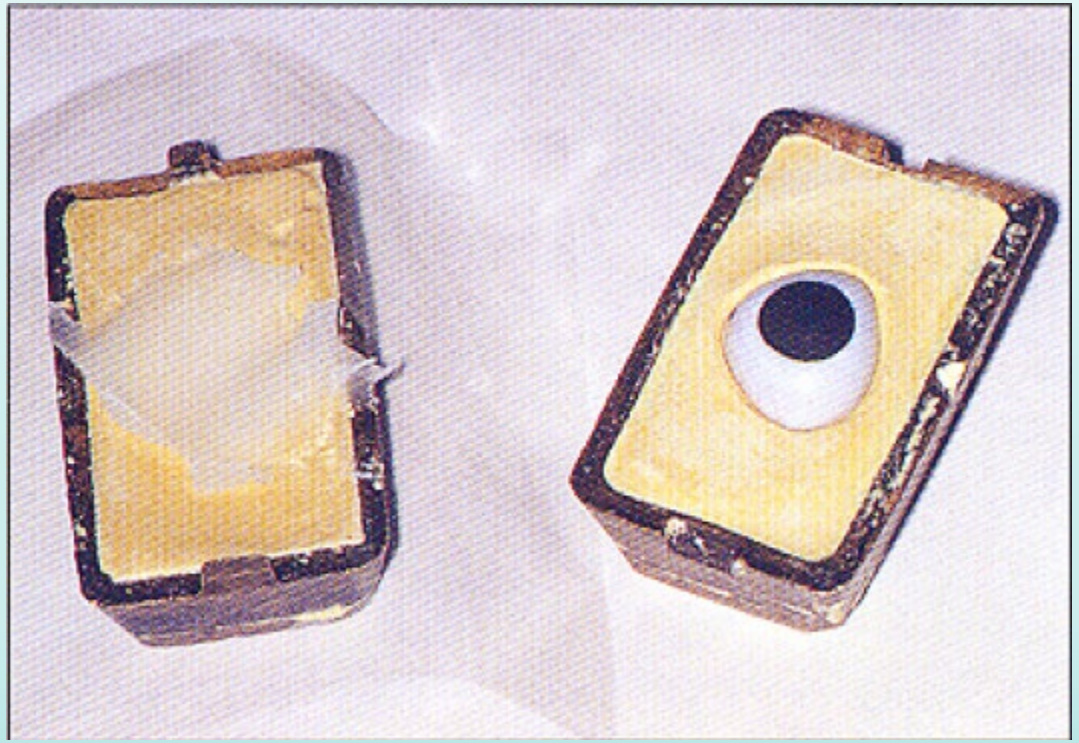




Paper Iris Disk Technique

Using a large abrasive stone, the entire anterior surface of the scleral blank is reduced at least 1 mm.

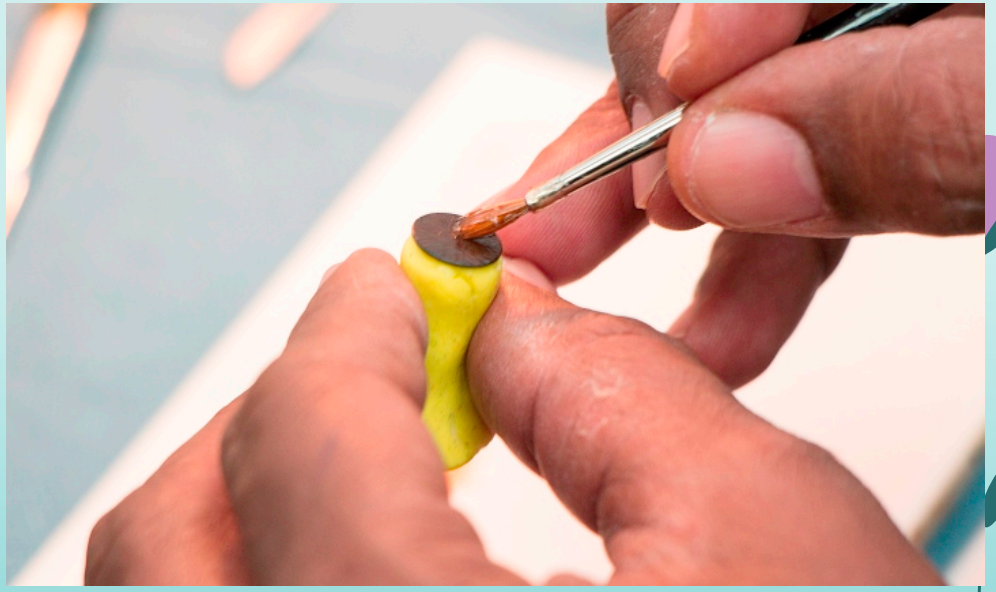




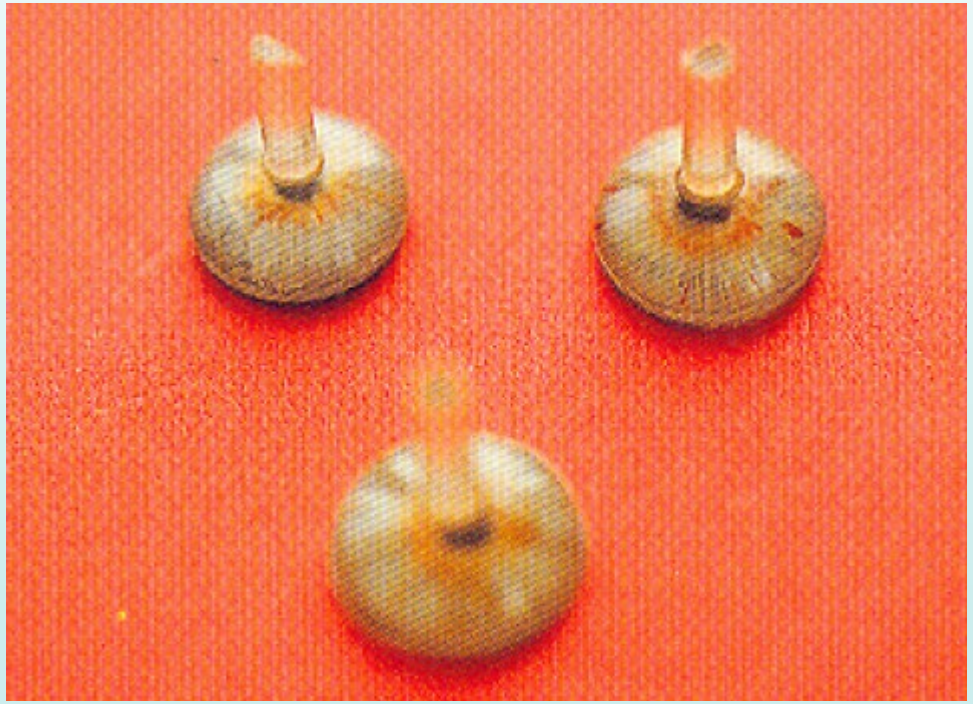
Black Iris Disk Technique

Jet black disks are available in sizes from 11 to 12.5 mm in 0.5-mm increments.
An iris disk approximately 0.5 mm smaller than the actual measurement should be selected, allowing for magnification of the iris by the clear acrylic lens.

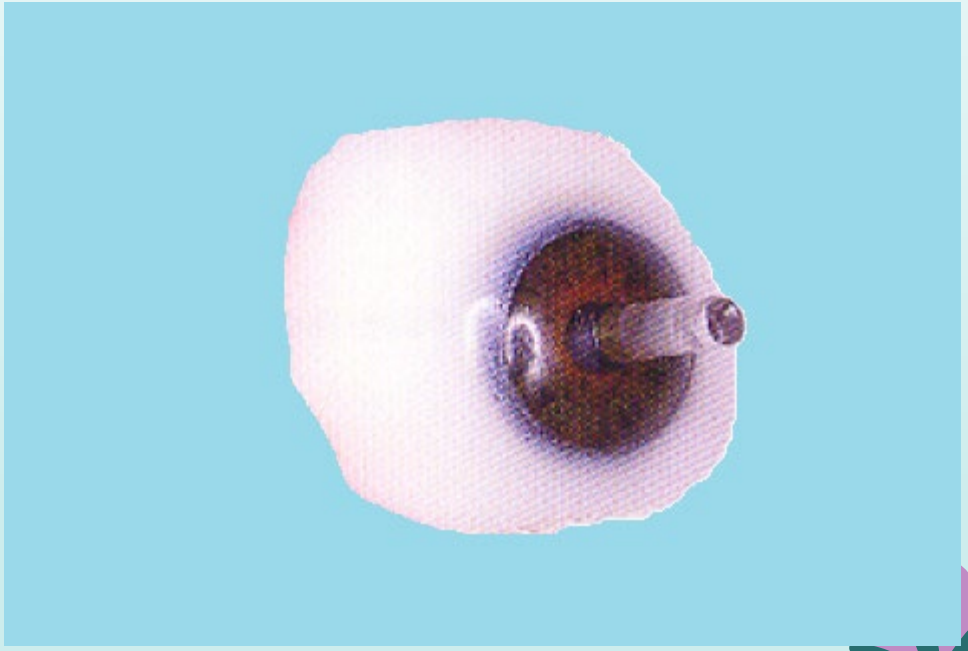
Oil pigments are employed in this technique to color the iris disk



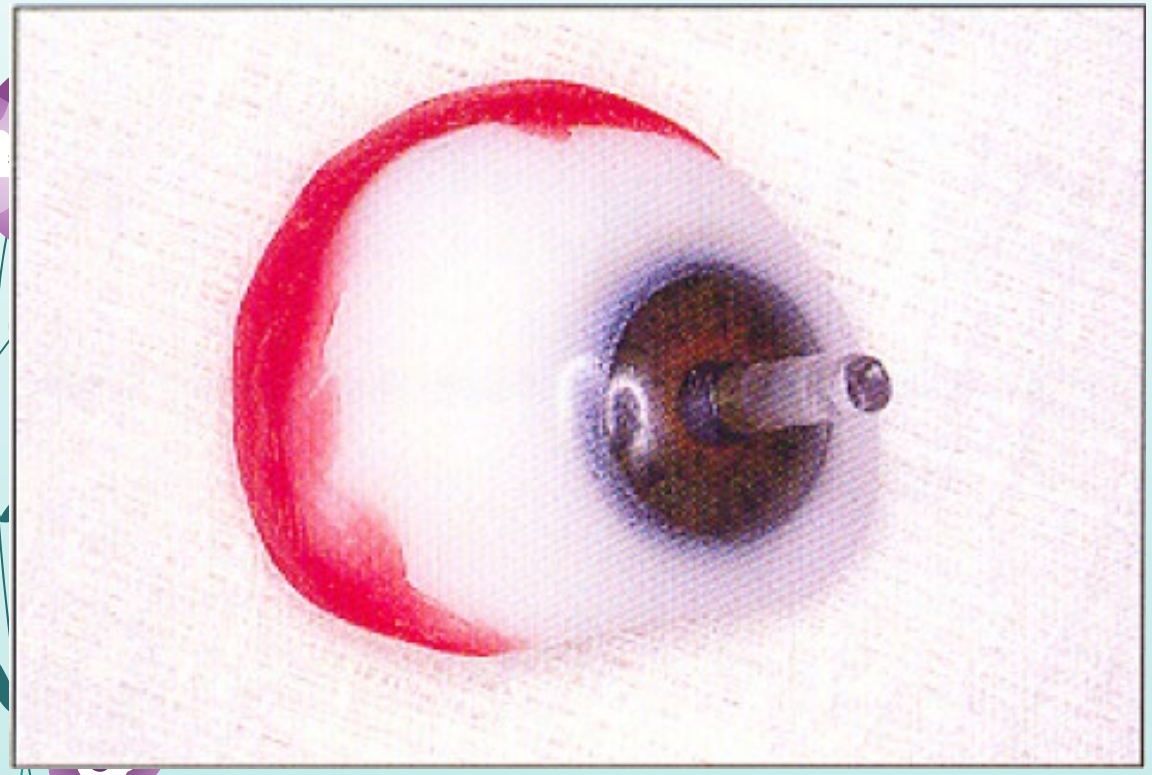
Black Iris Disk Technique

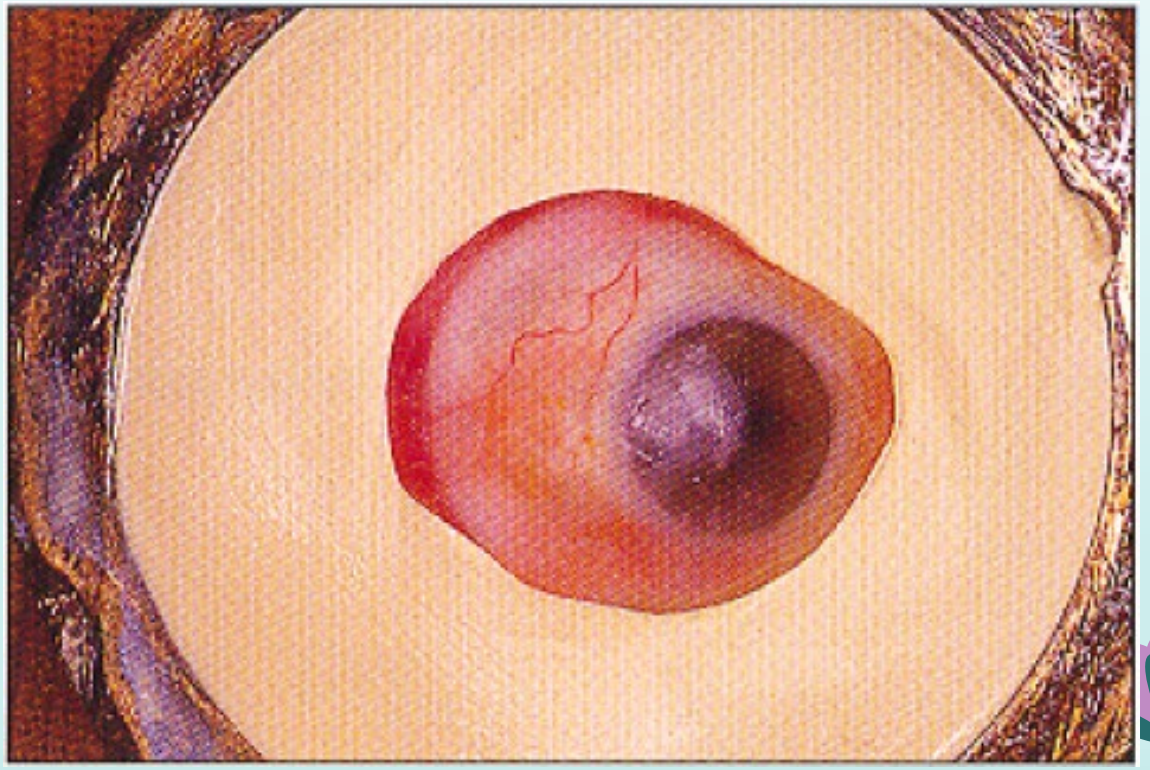


Black Iris Disk Technique



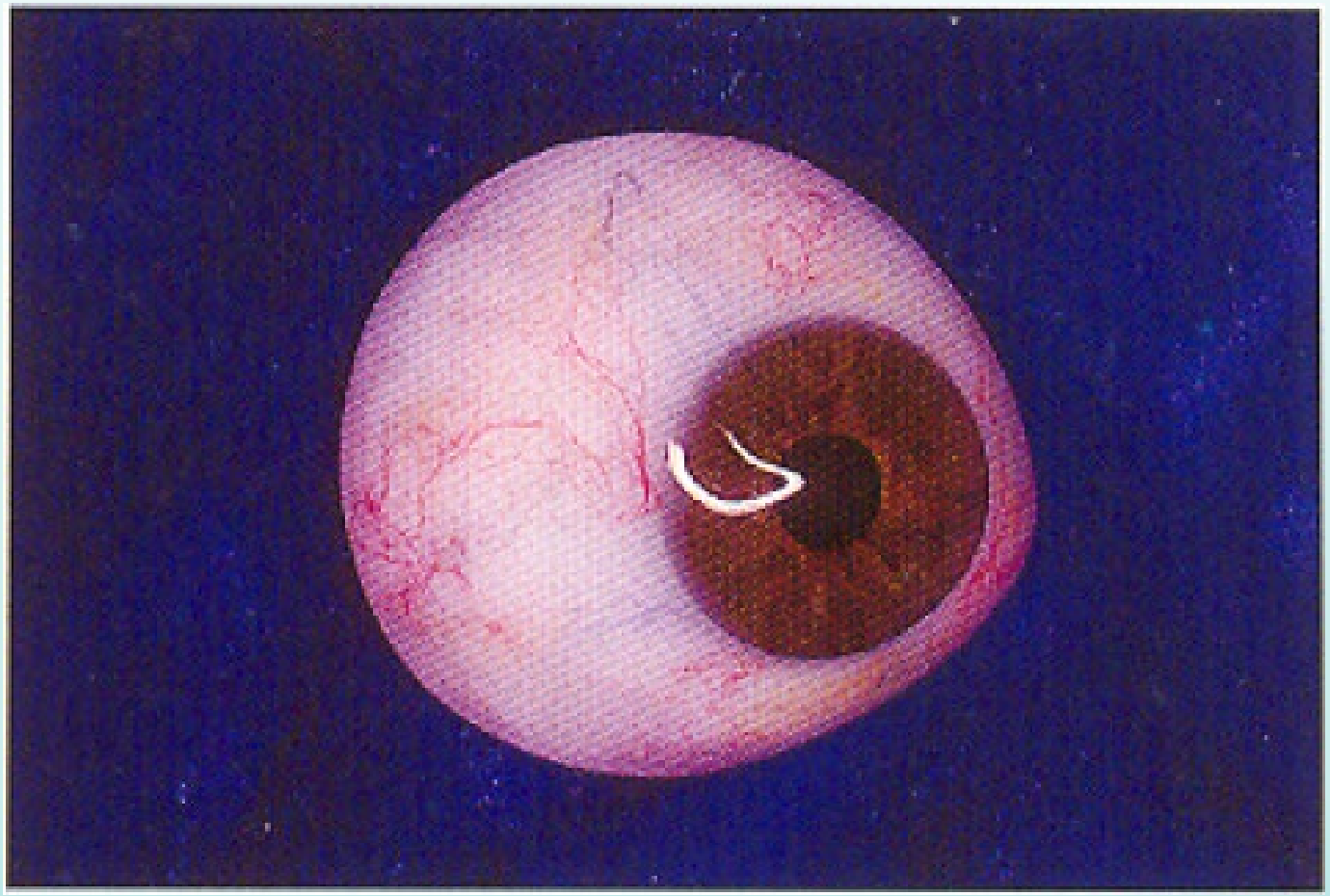
Black Iris Disk Technique





A sheet of 30-gauge pink casting wax is adapted over the frontal surface of the scleral blank

Black Iris Disk Technique



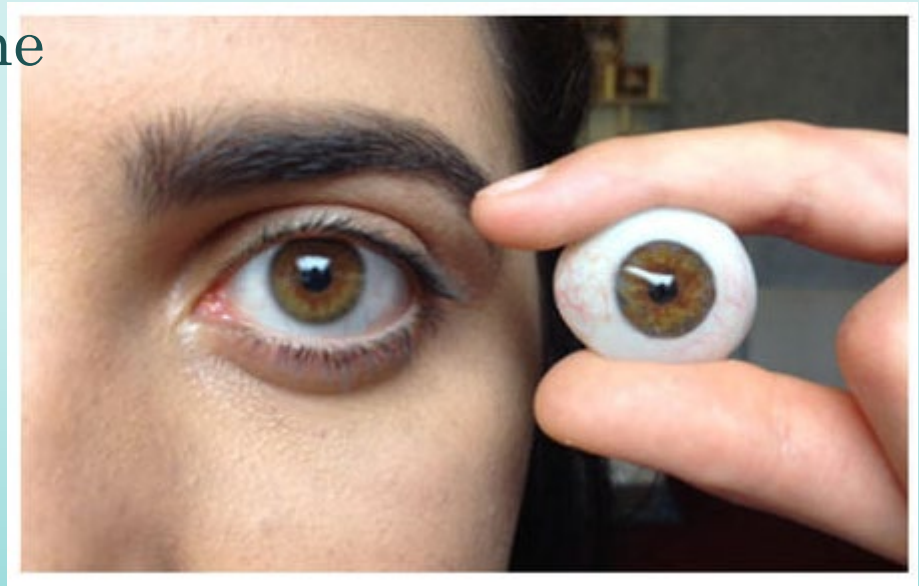
Placement of the Custom Ocular Prosthesis

1) A feeling of fullness is natural upon placement of the prosthesis.
2) The patient should be instructed on how to remove and place the prosthesis.
3) The patient should return in 1 day, 3 days, and 1 week for follow-up.
4) There is no need for the patient to remove the prosthesis except for cleaning. Once a week the prosthesis should be removed by the patient and cleaned with mild soap and rinsed well.
5) The patient should return at about 6-month intervals to have the defect and prosthesis evaluated and adjusted as necessary. The prosthesis should be inspected for scratches or deposits. If any are noted, the prosthesis should be repolished.

Summary

A properly fitted and acceptable custom ocular prosthesis has the following characteristics:

- Retains the shape of the defect socket.
- Prevents collapse or loss of shape of the lids.
- Provides proper muscular action of the lids.
- Prevents accumulation of fluid in the cavity.
- Mimics the coloration and proportions of the natural eye.
- Has a gaze similar to the natural eye.



Thank You