Fitting and Fabrication of the Ocular Prosthesis

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Overview
- Types of artificial eyes
- History
- Types of Ocular implants
- Fitting and fabrication process
- Complications the Ocularist may experience
- Problems patients experience
- Basic care

Types of Artificial Eyes
- Custom Ocular Prosthesis
- Scleral shell
- Custom conformer
- Stock Eye
- Glass eye

Custom Ocular Prosthesis
- Polymethyl methacrylate (PMMA)
- Impression fit
- Custom painted
- Generally fit over an implant
- Wore for weeks or months without removal

Scleral Shell
- Over a blind disfigured eye
- PMMA
- Impression fit (Tetracaine)
- Custom painted
- Removed at night
- Correct volume loss
- Entropion
- Light sensitivity
Scleral Shell

Anterior  Posterior

Scleral Shell Wearing Schedule

<table>
<thead>
<tr>
<th>SCGLERAL COVER SHELL DAILY WEARING SCHEDULE</th>
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<tbody>
<tr>
<td>Day</td>
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<tr>
<td>Hrs</td>
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Custom Conformer
- PMMA
- Impression fit
- Expansion of the socket
- Treatment of congenital Anophthalmia/Microphthalmia

Anophthalmia
- Absence of globe
- Enlarge monthly

Hydrogel Conformer
- Surgically implanted
- Expands 10x original size
- Implant placed after expansion
- Followed with conformers or prosthesis
Microphthalmia
- Small eyes
- Check monthly

Stock Eye
- Not Impression Fit
- Sometimes modified
- PMMA
- Removed nightly
- Poor motility

Glass Eye
- Hand blown glass
- Not common in the U.S.
- Advantage: being hollow
- Disadvantage: very breakable

History
- 1500’s first record of artificial eyes put in the socket
- Enucleation was not common until the middle of the 1800’s
- German craftsmen are credited with the invention of the glass eye in 1835
- Early 1900’s German craftsmen began touring the United States.
- Glass was used until the onset of World War II, US military hospitals developed the plastic eye and has been the preferred material in the U.S. since.

Ocular Implants
- Mules Sphere
- Allen
- Iowa
- Dermis fat graft
- Porous Implants (Medpor, Hydroxyapatite HA)
Mules Sphere Implant
- 1884 glass sphere implant
- Gold, silicon, rubber, acrylic
- Originally 11-13mm now more commonly 16-22mm.
- Problems with Migration
- Used in both Enucleations and Eviscerations

Sphere Implants

Allen Implant
- 1950’s
- Still used today
- Volume deficiencies
- Great motility

Allen Implant

Iowa Implant
- 1950’s
- Four prongs
- Not used today
- Exposure Problems
- Good motility

Iowa Implant
**Dermis Fat Graft**
- Grows with children
- Can be added on top of previous implant
- Great at fixing volume deficiencies

**Porous Implants**
- Hydroxyapatite (HA) similar to human bone
- Sea coral
- First implanted in 1985
- Medpor/Bioceramic are synthetic versions of HA
- Can be pegged
- Exposure risk

**Porous Implant**
- 8 weeks post-op HA
- PMMA Pegged HA
- Titanium Pegged Medpor

**Fitting/Fabrication Process**
- Consultation
- Impression
- Modeling/Sculpting
- Painting
- Final Fitting
- Adjustments
- Normally takes 8 total hours
- 1-2 days
- 5-7 years

**Motility Pegs**
- Consultation
  - Explain the process and ease fears
  - Realistic and Unrealistic expectations
  - Basic care of the prosthesis
Impression

- Gives us the correct shape to fabricate the posterior of the prosthesis
- Alginate material that is derived from seaweed
- Pain free
- 45 second set up time

Impression Posterior

Clear Trial Plate

- Allows us to check the impression
- Look for gapping
- Pressure points

Modeling/Sculpting

- Temporary wax material
- Correcting position, gaze and lid opening

Wax Modeling
Fabrication

Painting/Coloring
- Match the patient’s companion eyes with them present.
- This involves matching the iris color, limbal blend, scleral tinting and veining.
- Can involve using paint, colored pencils, and silk threads for the veins.

Digital Photos
- Colors not correct
- Lacking Depth
- Possible FDA issues

Painting

Veining/Scleral Tinting
Painting Final Check

Corneal Cap Processing

Final Polish

Final Fitting

Adjustments
- Color work
- Enlargement or Reduction
- Comfort
- Ideally we like to see everyone back in 3-4 weeks

Complications Ocularists Experience in Fitting
- Exposed Implants
- Superior Sulcus Deformity
- Upper Lid Ptosis
- Lower Lid Laxity
- Socket contraction
**Exposed Implants**
- May need surgical correction
- Vaulting the prosthesis may help
- Can happen with nearly all types of implants

**Exposure**

**Sunken Superior Sulcus**
- Sometimes can be corrected with the prosthesis
- May be able to be corrected surgically
- Hidden well with glasses

**Sunken Superior Sulcus**

Anterior Superior Sulcus Bump
Ptosis
- May be corrected with the prosthesis
- Surgical correction could be the best option

Lower Lid Laxity
- May cause retention issues
- Thinning the inferior edge of the prosthesis can help
- Surgery is often required

Socket Contraction
- Chemical burns
- Radiation Exposure
- Infection
- Ill-fitting prosthesis

Ptosis Crutch

Lower Lid Laxity

Socket Contraction
 Attempted Lid Closure
Complications Patients may Experience

- Itching
- Discharge
- Rotation
- Retention

Itching

- Dryness
- Allergies
- Rewetting Drops are helpful
- Silicone based prosthetic lubricants are good
- Lubricating Ointments in the evening

Discharge

- Generally we refer back to the Physician to rule out infection
- Can be dryness related
- Lack of lid closure (Lagophthalmos) is a big factor

Rotation

- Rubbing the eye can cause this
- In need of enlargement or new impression
- Good indication a child needs to be refit
- When the prosthesis is upside down usually you will see all white sclera
Rotated Prosthesis

Retained

Rotation Correction

Retention

• Rub towards the nose
• Possible time for a new impression
• Grinding the posterior concave
• Lid surgery may be the best option

Insertion

Insertion of an Artificial Eye

Basic Care

• Insertion

1) Apply rewetting drops or water to the anterior (front) and posterior (back) of the eye prosthesis.
2) Lift upper lid with the index finger to create an opening.
3) Slide top edge of prosthesis under the upper lid.
4) Release the upper lid once the prosthesis is in.
5) Pull down the lower lid and blink until prosthesis sets into the correct position.

Removal of an Artificial Eye

Basic Care

• Removal

1) Open eyelids, apply suction cup to the prosthesis and squeeze the handle. After attaching, hold onto suction cup lightly in hand.
2) Pull down the lower lid with finger. Tilt the prosthesis back and out, lifting out and over the lower lid.
3) Once removed, squeeze suction cup handle to release.
Basic Care

Cleaning

- Warm water and a gentle soap are good for cleaning an eye prosthesis. Baby Shampoo is the best choice
- This should be done once per month with a custom prosthesis or once per day with a custom shell
- Professional polishing is recommended every six months
- Alcohol will destroy a plastic prosthesis

Summary

- PMMA
- Replacement 5-7 years
- Polishing every 6 months
- NEVER use alcohol

Thank you

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