Innovative Uses of Adhesives in Anterior Segment Surgery

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Cyanoacrylate

• Butyl-2, not commercial “Super glue” or “Krazy glue” ethyl- (more toxic)
• 2-octyl (Dermabond) is less brittle
• Standard treatment for over 20 years
• Not FDA approved for the eye
  – Off-label use
  – Note on informed consent
• Histoacryl (TissueSeal, Ann Arbor, MI)
• Dental glue (Isodent, Ellman, Hewitt, NY)-no longer available to MDs

Cyanoacrylate

• Histoacryl, TissueSeal, Ann Arbor, MI
  – FDA approved for skin closure in 2007
  – Available in 2 colors
    » Blue (blau) or clear
  – Comes in 0.5 mm “single use” vials
  – $35 per vial plus S/H

Indications

• Corneal thinning
• Corneal perforation
• Corneal laceration
  – Usually unnecessary
  – Rarely, stellate lacerations that won’t seal, but glue attaches to suture
Indications

- Etiology of thinning/perforation
  - Sterile melts
    » Better candidates
  - Infectious ulcers
    » Not ideal. Treat with antibiotics prior to gluing

Best candidates

- Concave ulcers
  - Bulging Descemetocoeles do not respond well
- Small size
  - Ideally less than 1 mm perforation
- Not at the limbus
  - Glue tends to fall off prematurely at the limbus

Glue technique (one of many)

- Minor surgery setting under an operating microscope (ideally); can be done at the slit lamp
- Eyelid speculum
- Debride the epithelium off the area to be glued
- Dry the area to be glued
- Apply a small amount of glue to the perforation site

Application techniques

- Small plastic pipette
- Cut end of a retinal sponge
- TB syringe
- 18 gauge IV angio catheter
- Broken end of a cotton-tipped applicator
- Plastic sheet on the end of a cotton-tipped applicator
Glue technique

- Allow the glue to dry (polymerize)
  - May require several minutes
  - Do not touch glue with cellulose sponge
- Wet the glue once it has polymerized, to make sure it has totally set
- Place a BSCL and carefully remove the speculum

Glue technique

- Check at slit lamp immediately
- If the A/C was shallow/flat, check again 20-60 minutes later; A/C should be reforming
- Treat with topical antibiotics and preservative-free artificial tears
- Consider aqueous suppressants
Follow-up

- Recheck following day
- Recheck 1 week later, then every 1-4 weeks
- Replace BSCL every 1-3 months prn
- Use an eyelid speculum when replacing BSCL so the glue is not dislodged

Expectations

- The perforation seals
- The corneal tissue grows under the glue to permanently heal the perforation
- Once well healed the glue falls off
  - May take weeks to many months
- The glue remains in place until it is healed

Complications

- Glue in A/C
  - Caused by too large a hole
  - Prevent by placing a trimmed disc of collagen shield over the hole under the glue

Complications

- Glue in A/C
  - Caused by silicone oil in AC
Complications

• Hypopyon
  – Usually a sterile reaction, resolves on its own
  – Need to consider infectious etiology

Complications

• Glue falls off prematurely
  – Causes:
    » Too large a perforation
    » Too much epithelium to hold glue
    » BCSL fell off
  – Treat by regluing or proceeding to other treatments (e.g. patch graft, PK)

Complications

• Foreign bodies in glue
  – Weck cell can adhere to glue
  – Lashes can adhere to glue
• Shredded BSCS
• BSCS falls out
Complications

- Neovascularization
  - Usually improves greatly or resolves once the perforation seals and the glue falls off

Conclusion

- Cyanoacrylate tissue glue has a long track record of success in the treatment of corneal thinning and small perforations.
- Numerous application techniques work well.
- Appropriate surgical procedure and follow-up are required for the best outcome.