Advances in Retinal Surgery

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Outline

- Review 3-Port Vitrectomy
- Advances
  - Small Gauge Surgery
  - Valved Cannulas
  - Vitrectomy cutter design
  - Fluidics
- Changing management
- Future Directions
3 - Port Vitrectomy

- Vitrectomy instrument
- Vitreous is removed
- Fluid goes into eye to replace vitreous
- Opiotic light

Vitrectomy

Conjunctival Displacement
20-Gauge Opening
Valved Cannulas

- Increases efficiency - no plugs
- Increased self sufficiency
- Optimal IOP control
  - Lower risk of hypotony
Stable Operative Environment
Vitrectomy Cutters

- Port position - moved toward tip
  - Serve as multifunctional tools
    - Forceps, Backflush
  - Closer shave
  - Membrane dissection
Traditional Scissor based Dissection
Vitrectomy Cutter Dissection
Vitrectomy Cutter Dissection
**Improved Fluidics: Cutter Speed**

- Vitrectomy cutter = Guillotine cutter
- Increase cut rate decreases retinal motion
  - Stable operating environment
  - Decreases retinal tears
Improved Fluidics: Cutter Design

- **Conventional**
  - Port closed pneumatically, opened via spring

- **Dual Pneumatic drive**
  - Port is both opened/closed pneumatically
  - Allows for control of how much time port open
  - Allows for control of flow
Fluidics: Retinal Stability
Modern Vitrectomy Surgery

- **Advantages**
  - More Efficient
    - Improved fluidics
    - Reduced opening/closing times
  - Safer
    - Decrease incidence of retinal breaks
  - Increased patient comfort
  - Faster visual recovery
  - Less corneal topography changes
  - Reduced intraocular inflammation
Retinal Detachments
- Vitrectomy vs. Scleral Buckle vs. Pneumatic retinopexy
  - They all work
    - Lower Initial success with pneumatic
    - (65% vs 90+%)
  - Final anatomic success rates 98-100%
Retinal Detachments

- Multitude of factors affect choice
- Trend toward more Vitrectomies
  - Improved optics, instrumentation, and light sources
    - Improved safety and efficacy
    - Fewer complications than with SB
    - Main risk is cataract
RRD Repair using Vitrectomy
Retinal Detachments

- Scleral Buckle
  - Young Phakic eyes
  - No PVD

- Pneumatic Retinopexy
  - Select case
    - Single superior tear

- Vitrectomy
  - Pseudophakic eyes
  - PVD
Future Directions: Smaller Faster

- Decreased cutter size
  - 27 Gauge and smaller...
- Increased cutter speed
  - Twin Duty Cycle Cutters
    - 16,000 cpm effective rate
Conclusions

- Advances in Technology
  - Improved Instruments
  - Improved Fluidics

- Improves Outcomes
  - More Efficient
  - Safer
  - More comfortable patient experience
RRD Repair using Vitrectomy