HANDOUT FOR UNPLANNED VITRECTOMY 2015

COMPREHENSIVE STRATEGY FOR UNPLANNED VITRECTOMY FOR THE ANTERIOR SEGMENT SURGEON 2015
LISA BROTHERS ARBISSE, MD
MICHAEL HOWCROFT, MD, FRCSC
RETINAL SURGEON

DISCLOSURE
• No financial interest to report
**PRE-OP EVALUATION – PROBLEM CASES**

- Pseudoexfoliation syndrome and loose lenses
- Post-traumatic cataract (unilateral cataract)
- Cataract complications in fellow eye
- Prior vitrectomy surgery
- Unilateral shallow chamber

**PRE-OP SURGICAL PLANNING**

- Consider peribulbar anesthesia if complex
- Vitrectomy instrumentation on standby
- Book additional time for difficult/complex cases
- Level of difficulty classification

**PREVENTION**

- Recognize zonular laxity
- Avoid convexity of the lens dome
- Burp bag to prevent tampanade of ccc
- Have nucleus mobile-beware fibrosis
- Respect zonules during rotation
- Stay in “safe zone” with phaco tip
- Know where ccc edge is & keep vector safe

**PREVENTION CONTINUED**

- Keep paracentesis small and wound appropriate to control fluidics
- Understand machine settings/dynamics
- Keep instrument behind phaco tip to shield posterior capsule for last fragment removal
- Maintain capsular cul de sac during I&A
- Have post capsule concave for IOL insertion
- Maintain positive pressure during patient valsalva
### UNIFYING PRINCIPLES
- Prevent intraoperative vitreous traction
- Avoid postoperative vitreous traction
- Maintain normotensive globe
- Tight incisions for vitrectomy
- Vitreous always seeks lowest pressure
- Protect tissues from collateral damage (cornea, iris, capsule)
- Leave clean anterior segment

### PREPAREDNESS
- Incidence: 0.45% - 12% (2.09% Swedish NCR over 600K from 02-09)
- Code “V” practice
- Instrumentation
  - Triessence
- Medications
- Anesthesia
- Practice with pedal without patient

### STAGES OF COMPLICATIONS
- Broken posterior capsule with intact hyaloid
- Vitreous prolapse into the anterior segment
- Vitreous loss through the incision
- Retained lens material

### FIRST COMMANDMENTMENT OF ANTERIOR VITRECTOMY
- THOU SHALT NOT
  Avert attention during surgery
  –Early detection=limited damage
SECOND COMMANDMENT

• THOU SHALT NOT
  Allow the chamber to collapse after capsule rupture

  –Vitreous flows from a high to a lower pressure gradient

EARLY RESPONSE

• Don’t withdraw phaco instrument
• Go to foot position one (stop phaco and aspiration)
• Maintain chamber stability-don’t allow collapse
• Fill chamber with enough viscoelastic through side port to close incision as phaco tip is withdrawn (dispersive preferred)
• Assess situation: Inspect-Relax-Think-Announce Delay

ANESTHESIA

• Vitreous doesn’t hurt
• Topical/pledgett or sponge ring
• Subconjunctival lidocaine over PPI site
• Intracameral-expect amaurosis
• IV sedation
• Vocal local
• Akinesia prn by parabulbar or sub-Tenons

THIRD COMMANDMENT

• THOU SHALT NOT
  Allow an open system intra or post-op

  –Use a biaxial vitrectomy technique with irrigation anteriorly and vitrector through a tight paracentesis or pars incision
  –Keep the globe formed with OVD and with closed incisions or scleral plug
FOURTH COMMANDMENT

• THOU SHALT NOT
  Irrigate, displace or fish through vitreous
  If nucleus is below posterior capsule refer for 3 port vitrectomy

TO RAISE FROM PC TO AC: DO

• Stabilize and protect with OVD sandwich
• Remove impediments to forward movement
  – Pupil stretch or iris hooks
  – Tangential cut and spiral CCC (don’t radial relax)
• Raise descending nucleus from posterior to anterior chamber
  – Visco-levitation from pars plana
  – Arbisser Nuclear Spears to elevate from opposing anterior paracenteses
• *Epsilon Ophthalmic Instruments Arbisser has no financial interest

But the anterior hyaloid is not always intact
VITREOUS IS A COMPLEX STRUCTURE NOT JELLY

ONCE RAISED TO AC: DO

• Compartmentalize lens and vitreous with OVD
• Miochol E, lens glide, IOL optic capture or IOL scaffold technique
• Identify vitreous (Triessence)
• Slow motion phaco if no admixture
• Conversion to ECCE if in doubt

FIFTH COMMANDMENT

• THOU SHALT NOT
  Fail to identify vitreous presentation
  – Preservative free Triamicinolone particulate staining after OVD removal
  – Instill as last maneuver

SIXTH COMMANDMENT

• THOU SHALT NOT
  Aspirate vitreous with phaco or I&A
  _ Compartmentalize vitreous and lens fragments
  – remove cortex dry, with vitrector on I-A-cut or bimanual I&A
SEVENTH COMMANDMENT
• THOU SHALT NOT
  Weck or sweep vitreous from the wound
  —Traction on vitreous = retinal tear

EIGHTH COMMANDMENT
• THOU SHALT NOT
  Fail to understand vitrectomy settings
  — Always cutting while aspirating
  — Highest cut rate available
  — Lowest effective flow and vacuum (not linear)
  — Bottle balanced to maintain normal tension

VITRECTOMY PARAMETERS
• ALWAYS CUT BEFORE SUCK
• Select Settings to Reduce Vitreoretinal Traction
  — Highest Cut Rate Available (450-5000)
  — Flow Rate 20 ml/min (15 for 23g)
  — Lowest Vacuum Producing Vitreous Removal 150-250 mm hg (350-500 for 23g) panel setting not linear (depends on presence of OVD) *
  — Raise bottle to create normotension*
    Less Vacuum/Flow = Less Traction

ANTERIOR INCISION
• Biaxial (separate sleeve from vitrector shaft)
• Irrigation through sideport
• Never use primary coaxial incision site
• Make new paracentesis to fit bare vitrector shaft using original sideport for irrigation
• Hold steady tilted below posterior capsule
• ANTICIPATE REPEAT PRESENTATION

*Alcon Centurion: vacuum stays linear with IOP set to 25
New Clear Corneal Incision to fit Vitrector

Biaxial

Best for minimal vitreous presentation

Only choice when view behind pupil is obscured

Pars Plana Incision

Irrigation through sideport

3.5 mm Vitrector posterior to limbus

PARS PLANA INCISION?

DO WHAT YOU KNOW

- Still controversial in the US
- Skills transfer lab
- Eye bank eyes, animal eyes
- Accompany local retinal surgeon to OR
- Shadow at former residency department

VITRECTOMY TREATMENT OPTIONS

- Wisp around zonules:
  - Cut with intraocular scissors to amputate, reposit with OVD
- Small prolapse or no view through pupil:
  - Automated vitrectomy, anterior incision
- Vitreous loss or sheet around zonules:
  - Automated vitrectomy, direct pars plana incision
- Intact globe, planned vitrectomy:
  - Sutureless incision with trocar system
Vitrectomy Techniques for Vitreous Loss at Cataract Surgery

Michael J. Howcroft MD FRCSC
Eye Surgeons Associates P.C.
IOWA AND ILLINOIS QUAD CITIES

FINANCIAL DISCLOSURE
SPEAKER FOR Genentech’s LTOP program

Anterior Vitrectomy – CCI Incision vs. Pars Plana

• Incisional vitrectomy for limited vitreous prolapse/lens fragments
• Disadvantage of incisional vitrectomy is aspirating additional vitreous into AC
• Pars plana vitrectomy allows a more complete anterior vitrectomy
• Vitrectomy through pupil NOT the same

Anterior Vitrectomy – Surgical Techniques (Pars Plana) - 20 gauge

• Conjunctival peritomy – hemostasis
• MVR sclerotomy 3.0 - 3.5 mm from limbus
• Sclerotomy avoid 3,6,9 and 12:00 (ciliary vessels and nerves)
• Infusion through angled cannula/AC maintainer in paracentesis incision
### Anterior Vitrectomy – Surgical Techniques cont’d

- Aim MVR blade at optic disc
- Penetrate completely
- Maintain IOP at normal levels (20 – 25 mm Hg)
- Direct and angled illumination

### Anterior Vitrectomy – Surgical Techniques cont’d

- Avoid inserting cutter too deeply
- Mark cutter at 10mm
- Cutter port facing vitreous/lens material
- Cutter tip always in view
- Proceed slowly and methodically

### Anterior Vitrectomy - Endpoint

- Round pupil
- No iris movement during vitreous aspiration
- Anterior chamber deep
- No more Triessence identification

### Anterior Vitrectomy - Endpoint

- Aspiration off – infusion off – cutter off – remove cutter
- 8-0 Vicryl
- Crossing “X” suture
- Weck-cel wound not recommended for anterior vitrectomy only total vitrectomy
- Separate conjunctival closure
Anterior Vitrectomy – Surgical Techniques
23 and 25 gauge

• Transconjunctival or scleral entry
• Angled (two-stage) incision
• Trocar and cannula placement

Anterior Vitrectomy – 23 Gauge –
Advantages

• Small incisions
• Suture-less
• Less inflammation
• Faster healing

Anterior Vitrectomy – 23 Gauge –
Disadvantages

• Familiarity/experience
• More complex incision
• Complication rate unchanged

Anterior Vitrectomy – Post-op Care

• Refer for residual nucleus (risk/benefit of viscolevitation)
• Discuss complication with patient early
• Post-op IOP control
• More frequent follow-up visits
• Careful peripheral indented exam within 1-2 weeks
• Vitreoretinal consultation as required
**Summary**

- Anticipate and prepare for complicated cases
- Pars plana approach allows a more efficient and complete removal of vitreous
- Be aware of your limitations and obtain expert consultation where appropriate

**STANDARD PARS PLANA INCISION**

- Make fornix based flap in quadrant
- 3.5 mm from limbus enter with MVR
- Aim at optic nerve
- Visualize in pupil; penetrate completely
- Use sideport for irrigation (prime tubing)
- Insert vitrector and visualize in the pupil
- Use plug when withdrawing vitrector
- Direct sclerotomy of any gauge needs suture

**SUTURELESS PARS INCISION**

- Firm eye with sutured incisions PRN
- 23g trocar cannula system
- Non-coincident conjunctival and scleral puncture
- Scleral tunnel parallel to limbus 3.5 mm back
- Turn to puncture towards optic nerve driving trocar and cannula through sclera
- Remove trocar and leave cannula for vitrector insertion
- Use plug when withdrawing vitrector
- Point pressure with Q tip to close

**RESIDUAL CORTEX REMOVAL**

- “Dry Technique” under OVD without irrigation
- Bimanual I/A small risk of incarcerating vitreous
- Vitrector on I-A-Cut mode (not I-Cut-A default) for followability
  - Avoids traction on vitreous by cutting in foot position 3
- Prevent chamber collapse on removal of instruments: vitreous will follow path of lowest pressure and represent
INSPECT

- Verify clean bag
- Absence of vitreous
- Re-instill triamcinolone and rinse away
  - Round pupil
  - Clean, sealable incisions
- Verify status of CCC
- Evaluate extent of posterior capsule tear

NINTH COMMANDMENT

- THOU SHALT NOT
  Purposely violate both anterior and posterior capsule
  - Destruction of CCC = unstable IOL
  - Enlarge with radial cut and spiral tear

IMPLANT POSITION

- Foldable through CCI
  - In the bag: only if small PCCC opening or supported zonulolysis
  - Bag implanted haptics PCCC (POBH) or CCC-forward captured optic
  - Sulcus implanted haptics CCC-captured optic
  - Sulcus fixation: adequate capsule support??
  - Sulcus implantation with scleral or iris suture fixation
  - Glued scleral fixated IOL
  - Open loop AC LOL (use vitrector to make PI)

VITRECTOMY PROCESS

- Secure primary wound if no vitreous loss
- Fill globe with OVD to firm if loss
- Always visualize the port when cutting
- Petal to the metal to establish removal of vitreous at lowest vacuum possible*
- Get normotensive globe by raising bottle*
- Remove all vitreous from anterior chamber to below capsular plane
- At endpoint (Triessence confirmed) stop suction continue to cut as instrument is withdrawn
- Stop irrigation just before exiting

*exception: Alcon Centurion
ENDPOINT

- Remove all vitreous from anterior chamber to below capsular plane
- Amputate any vitreous to incision severing posterior attachments BEFORE wecking
- Do not sweep the incision (traction)
- Never allow chamber to shallow thereafter
- No aggressive OVD removal
- Final Triessence to confirm absence of representation and for anti-inflammatory effect

TENTH COMMANDMENT

- THOU SHALT NOT
  Fail to provide aggressive antibiotic prophylaxis
  Ruptured capsule = 14x endophthalmitis risk
  – Consider intracameral even for routine 1:14,000 vs 1:1100 (Arshinoff JCRS 2012)
  – Single dose oral fourth generation fluoroquinolones

POST OP CARE

- Intracameral Vigamox* and oral moxifloxacin (Avelox 400mg) prophylaxis
- Warn patients to expect floaters, educate for retinal symptoms
- Prophylax and treat pressure spike
- Timely referral to retinal surgeon for retained nucleus
- Scleral indented retinal exam
- Aggressive anti-inflammatory management
- Close monitoring for CME
- Disclosure to patients

*off label use

SEE DIDACTIC AND VIDEOS ONLINE

- http://www.Eyetube.net/unplanned-vitrectomy
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drlisa@arbisser.com