Diabetic Retinopathy: Considerations for the Cataract Surgeon

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Outline

• Review Diabetic Retinopathy and CSME

• Talk about perioperative effects of Cataract surgery

• Review Newer Data
Statistics

• 220 million people with diabetes
• Framingham Eye Study:
  – 3-4 X higher occurrence of cataracts
• Wisconsin Epidemiological Study:
  – Cataract principal cause of legal blindness in adult-onset diabetics
Diabetes – Effects on the Retina

• Non-Proliferative Diabetic Retinopathy
  • Usually no treatment
  • F/u depends on severity 2-12 mo.
• Proliferative Diabetic Retinopathy (2-4 mo. f/u)
• Tractional Retinal Detachment
• Diabetic macular edema (quicker f/u)
• Macular ischemia - prognosis limited
Extended Follow-up

- Follow up Q 2 yrs.
- Must meet certain criteria
  - A1C levels are <7
  - Consistent BP control (< 130/80 mmHg)
  - Dilated eye exam (≤ 1 yr.) shows no retinopathy
Review NPDR

- **Severe NPDR (1 of the following):**
  - Heme/Microaneurysms in ≥ 4 quadrants
  - Venous Beeding definitely present in ≥ 2 quadrants
  - IRMA in ≥ 1 quadrant

- **Very severe NPDR (≥ 2 of the above)**
Venous Beading
Intraretinal Microvascular Abnormalities

Photo from Ryan et. al.
Review High-risk PDR – Treat

- Neovascularization of Disc with Vitreous Heme
- Neovascularization of Disc of $\frac{1}{4}$ disc area
- Neovascularization elsewhere with Vitreous Heme
- Severe extent of new vessels near the nerve
Neovascularization
Review CSME – When to Treat

- Thickening $\geq 1$ disc diameter within 1 disc diameter of fovea.
- Thickening within 500 um of fovea
- Hard exudates within 500 um of fovea if associated with retinal thickening
Cataract Surgery and Diabetics
Concerns after Cataract Surgery in Diabetics

- Accelerated progression of retinopathy
- Macular Edema
- Posterior Capsular Opacification
- Fibrinous Uveitis
- Neovascularization of Anterior Segment
  - Rare now that ICCE rarely done
Cataract Surgery’s Effect on Diabetic Retinopathy

• Depends on:
  – Severity of retinopathy
  – Duration of diabetes
  – Glycemic control/Insulin use/HgbA1c
  – BP control

• 15% rate of progression for experienced surgeons vs 70% for the inexperienced
  – Progression seen for all stages
  – Recent data shows better results
ETDRS Preventative Data

• Early photocoagulation prior to cataract
  – Better outcomes
• Extracapsular cataract extraction
  – less favorable prognosis
• Treat CSME or PDR prior to cataract surgery
Cataract Surgery and Macular Edema

• ~50% of Diabetics develop new macular edema after sx
• 50% resolution at 6 mo. & 75% at 1 yr.
• ETDRS: no long term ↑ in macular edema after 4-9 yrs.
Cataract Surgery and CSME

• CSME @ time of surgery
  – ↑ chance of persisting > 1 yr.
• ~50% UCVA of 20/50 @ 1 yr. without:
  – short surgical time (<25 min.)
  – Preop. mgmt. of retinopathy
  – Mgmt. of hyperglycemia and HTN.
Treating Macular Edema

- Anti-VEGF with deferred laser:
  - Best method according to studies
  - Consider pt’s concerns with injections
  - Long term potential (focal) vs short term (anti-VEGF)
  - Anti-VEGF may → progression of Traction “Crunch Syndrome”
  - Likely need 2-3 injections each 6 mo.
“Crunch Syndrome”

- Occurs after anti-VEGF if Traction/fibrosis present prior to injection
- Tractional Retinal Detachment can develop
CSME Resolved with Heavy Focal
OCT of CSME/CME

- CSME with PVD
  - More amenable to treatment w/o surgery

- CSME with Traction
  - Likely → Vitrectomy
HD OCT Shows Structural Integrity
Loss of Inner Segment/Outer Segment Junction

- Loss of IS/OS
  - Suggests ↓ prognosis for pt’s vision
Neovascularization
Consider Laser in Areas of Capillary Dropout

May help prevent neovascularization or ↓ macular edema by eliminating source of VEGF
New Data: Cataract Surgery In Diabetics
Recent Data – Mostly Retrospective

• Recent article:
  – 285 diabetic pts with phacoemulsification
  – All categories of diabetic retinopathy studied
  – All categories gained vision
  – 23 patients lost vision (hx of focal common)
  – CSME incidence at 1 yr. was 4%
Support for Earlier Cataract Removal in Diabetics

• More recent data with current technology/skill sets:
  – ↓ Progression of retinopathy with better post-op vision
  – Better view for early Dx
  – Better view for Tx
  – Diabetic retinopathy usually worsens as you wait on the cataract
New Data

• Intravitreal Avastin @ time of cataract surgery may ↓ progression to 7.4%
  – 30 control eyes vs. 27 avastin intraop
  – ↓ Incidence of neovascular glaucoma
  – BCVA same between groups
Timing for anti-VEGF/focal

- Pre-op slightly better than Post op (most small studies)
  - Pre-op: 2 wks. – 1 day
  - Post-op: up to 2 wks.
Timing for PRP

• Mild cataract: surgery after PRP & stability seen for 6 mo. - 1 yr.

• Severe cataract or PSC disturbing view: cataract before PRP
  – pre/post op avastin prn for macular edema
  – Some recommend waiting at least 6 mo. after surgery to ensure no Irvine-Gass
Combined Vitrectomy and Cataract Extraction

- All nuclear sclerosis will progress after vitrectomy hampering future eval/tx
- Complications from cataract surgery
  - Some resolved during vitrectomy
- Major concern for diabetics
  - Neovascular glaucoma
  - Prp needed & anti-VEGF
Patient’s Point of View – Combined Cat/Vit

- ↓ # of surgeries
- Faster recovery time/↓ stress
- Prompt return to daily life
- Cost and pressure on medical resources
  - Reduced with combined surgery
Sensitivity to Referral Sources

- Patients may be referred hours away for procedures to avoid losing cataracts.
- Patient would probably prefer the referring doctor to do the cataract.

- For me: only internally (Temple) referred, Macular Holes due to 30% reopening rate after cataract surgery.
My Cell Phone

- 713-444-7837
- Access
Resources

Resources

Resources


• **July/August 2011 Insert**
• **Should Combined Phacoemulsification and Pars Plana Vitrectomy Be Used Routinely?**
• **A review of the literature.**
• By SOM PRASAD, MS, FRCSED, FRCOPHTH, FACS
Cataract Surgery After Vitrectomy: More Risky

- 12.5% rate of intraop. complications
- 20.8% rate of postop. complications
- Re-detachment of retinas
  - Seen in 5.6% of eyes
Best Candidates-Combined Cat/Vit

• Visually significant cataracts
• Those that impede view (cortical/psc)
• Patients > 50
  – Likely need cataract surgery soon
• Not as well suited for:
  – Younger pts.
  – Active rubeosis
  – Severe traction, ischemia or rhegmatogenous retinal detachment
Nagahara Phaco-chop

- Half the risk of diabetic progression and incidence of macular edema compared to divide and conquer
- Better post-op pachemetry at 10 days post-op
Diabetes and Corneal Endothelium

• Specular microscopy and ultrasound pachymetry used to measure corneal changes after cataract surgery

• Endothelial loss
  – Diabetic patients lost ~19.5%
  – Non-Diabetics lost 16.5%
Cataract Surgery after Vitrectomy Done for Diabetic Macular Edema

- Relatively safe
- Visual acuity remains stable (~30%) or improved (~70%)
- Foveal thickness increases by about ~15% but insignificant