Title: Neovascular glaucoma associated with proliferative diabetic retinopathy; Diagnosis and management.

81 year old male with history of proliferative diabetic retinopathy develops neovascular glaucoma OS. Patient has history of PRP OU with progression of neovascularization into anterior segment/angle of eye OS. Treatment with glaucoma regimen and possible surgical intervention.

I. Case History:

- Patient demographics-
  81 Year old African American male
- Chief complaint:
  Pain of the eye OS- with long-standing Hx of Diabetic retinopathy
- Medical history:
  (+)Diabetes Type II- insulin dependent for- 35 years
  (+)Colon Cancer
  (+)Prostate Cancer
- Ocular history:
  (+)proliferative diabetic retinopathy with neovascular glaucoma
  (+)panretinal photocoagulation OU
  (+)cyclocryablation inferior 180 OS
  (+)cataract extraction sulcus IOL OS
- Medication:
  -Ocular Medication- Simbrinza BID OS and Ketotifen BID OU
  -Medical- Ampicillin, Insulin-Glarigine, Ipratropium, Metformin, Tamsulosin.
II. Pertinent findings:

- **Preliminary Testing:**
  - BCVA: OD: 20/70+2 pinhole: 20/60-
    OS: Count finger at 60 cm
  - Pupils: PERRL (+) APD OS
  - EOM: full and smooth OU
  - IOP: OD: 11mmHg OS: 28mmHg w/ GAT at 10:30am

- **Biomicroscopy:**
  - Lids: MGD OU; lagophthalmos OS
  - Conjunctiva: 3+ injection OU
  - Corneas: SPK inferior OU
  - Ant.chamber: deep and quiet OU
  - Iris/Pupil: OD: (-) NVI OD,
    OS: 1 vessel loop from 2 to 3 o’clock periphery OS and 1 loop at 11 o’clock, ectropion uveae present OS; iridocorneal adhesion temporally/nasally

- **Dilated Fundus Exam:**
  - Vitreous: syneresis OU
  - Optic disc: OD: 0.3 h/v (shallow cup) OS: 0.99 h/v OS
  - Macula: OD: flat with scattered exudates
    OS: exudates and fibrotic membrane
  - Vessels: attenuation and scattered dot hemes OU
  - Periphery: PRP 360 OD/OS, OD: fibrotic membrane from disc going superiorly scattered exudates OU

- **Imaging:**
  - HVF 24-2: OS shows arcuate defect with possible nasal step
  - Fundus Photos OU: PRP laser scars scattered in posterior pole OU
III. Differential Diagnosis:

- Primary: Neovascular glaucoma
- Alternative Differentials: acute angle-closure, dry eye, corneal abrasion, injury to the eye, infection, uveitis.

IV. Diagnosis and discussion:

- Neovascular glaucoma secondary to diabetic retinopathy with retinal ischemia.
- Fibrovascular membrane growth over the anterior chamber and into the angle.
- Contraction of the membrane will cause peripheral anterior synechiae and leading to angle closure (painful eye)

V. Treatment and Management:

- Reduce IOP: Topical: beta-blockers, alpha-agonist, systemic or topical CAI.
- Current treatment for Pt. Simbrinza BID OS only with systemic condition (diabetes) under control
- Panretinal photocoagulation OU and cyclocryablation inferior 180 OS

Literature Review:

- Atropine can be used to reduce IOP through uveoscleral outflow
- A response to treatment of IOP with Ganfort(bimatoprost/timolol) in a group of 50 patients 72.5% of patients shows a 3X decrease in IOP compared to standard treatment involving patients with secondary neovascular glaucoma and diabetes mellitus.
- Management of painful eye in patient with angle closure/ “absolute glaucoma” include retrobulbar alcohol injection and cyclodestructive procedures.
- Alternative treatment considering Anti-VEGF treatment comparing
off-label use of bevacizumab and ranibizumab showing to affective at preventing or even regressing iris and iridocorneal angle neovascularization.

VI. Conclusion:

- Proliferative diabetic retinopathy is almost always ischemic in nature. Under hypoxic conditions, development of vascular endothelial growth factor leads to growth of new unstable/immature blood vessels in the posterior and anterior segment of the eye. Most common ischemic diseases include diabetic retinopathy, central retinal vein occlusion and carotid disease.

- In the current case, patient developed neovascular glaucoma OS leading to surgical intervention including PRP and cyclocryablation OS. Currently maintaining intraocular pressure controlled with Simbrinza BID OS only and with systemic condition (diabetes) under control. Intraocular pressure OU are stable.

- Neovascular glaucoma is difficult to manage and as current research shows alternative treatments include: glaucoma medication, off-label Anti-VEGF injections and surgical interventions. Research is still on going.
References:


