End stage glaucoma management

A 48-year-old female has had multiple drug treatment for glaucoma and is still losing field of vision. How do you manage this over time?

This patient is at high-risk for going blind and should be managed aggressively to protect remaining vision. A holistic, individualised approach is needed. Relevant ocular and systemic factors along with psychological considerations (e.g. fear, depression), socio-economic factors should be assessed before deciding with the patient and family what treatment goals should be and how they can best be approached.

Things to do:

1. Assess old medical records to find out
   a. History:
      - blinding glaucoma in family
      - trauma
      - steroid use
      - vasospasm-Reynaud's phenomena and migraine
      - significant blood loss
      - pregnancy problems
      - refractive or any ocular surgery
      - atopy and skin disorders
      - allergies
      - medication.

   b. Examination:
      - record highest ever recorded intraocular pressure (IOP)
      - highest inter-visit fluctuation of IOP with times
      - central corneal thickness
      - percentage drop in IOP with each medical intervention
      - record of any ocular co-morbidity: retinal tear / retinopathy, etc.
2. Form a rapport:
   - consult with partner and family
   - listen to them first to identify their concerns, fears, beliefs, lifestyle, interests and hobbies
   - limitations in personal and work environment
   - assess their knowledge of glaucoma including newer treatments
   - assess her drop technique and schedule
   - fill in the gaps: history / examination.
3. Clinical examination: look for signs of
   - ocular surface disease
   - episclerits and scleritis
   - microcornea
   - pigment dispersion
   - pseudoexfoliation
   - uveitis
   - abnormal pupil shape, polycoria, iris hypoplasia (anterior segment dysgenesis) and associated systemic abnormalities
   - gonioscopic examination to look for primary angle closure and / or plateau iris, abnormal iris processes, prominent schwalbes line, iris nodules in angle, peripheral anterior synaechiae, new vessels
   - enlarged episcleral veins.
4. Investigations:
   - MRI scan with gadolinium if no evidence of high pressure
   - consider diurnal fluctuation of IOP
   - blood test to rule out hyperviscosity,anaemia, B12 and folate levels
   - baseline 10-2 perimetry (with 24-2) to assess central visual fields closely in future.
5. Treatment:
   - treat the mechanism and observe closely.
   - improve ocular surface.
   - improved drop technique may bring IOP significantly down.
   - close observation with 10-2 visua field and optic disc imaging.
   - argon / selective laser trabeculoplasty may be offered in addition to above measures.
   - minimally invasive glaucoma surgery (usually done along with cataract surgery) achieves IOP of 14-15mmHg and is not the best option for end stage glaucoma.
   - trabeculectomy with mitomycin C with adjustable and releasable suture is the best procedure to offer long-term control. A detailed discussion about the risk and benefits of this surgery including implications of complications should take place.

Any such intervention needs to work around her personal and familial needs. She will require more time and effort by a competent and trained glaucoma surgeon's team. Therefore, she needs to be referred to local or regional glaucoma specialist.

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TAKE HOME MESSAGE

Take home message: Establishing rapport with the patient improves compliance and delays the need for surgical intervention like trabeculectomy, which remains the gold standard.

Maximal medical therapy for glaucoma is three anti-glaucoma agents plus or minus oral acetazolamide with no adequate IOP control, and/or advancing optic disc cupping or field loss.

Then I would check the compliance, tolerance, allergy to topical medication. I advise optimal drops technique, or changing to preservative free medication, or changing regime could improve the patient's compliance, and hence the outcome.

If ocular surface disease is present, treat with (anti metal proteases) doxycycline 25 or 50 mg/day for three months if not contraindicated, especially if patient is on warfarin. This usually improves ocular surface, patient's compliance and lower incidence of surgical failure.

If none is of the above is present or no improvement recordable, one should consider other surgical options,

if the angle is open on gonioscopy, selective laser trabeculoplasty (SLT) should be considered. However, if the intended reduction of intraocular pressure (IOP) is high or there is advanced damage I would consider other surgical options.

Examining the conjunctiva is important prior to any surgical procedure in the glaucoma firm, i.e. hyperaemia, scarring, mobility, etc. This will influence my decision to select a particular surgical procedure.

If the patient has cataract and is symptomatic visually with a mild or moderate glaucoma, I will offer this patient a phaco intraocular lens (IOL) and endoscopic cyclodiode photocoagulation (ECP) with special consideration to operate temporally to preserve the conjunctive for future surgery if required. Another option is phaco IOL and i-Stent which gives adequate results in selected cases. If using ECP, check for fibrinous reaction in the first week and I usually put the patient on steroids for at least eight weeks, plus glaucoma medications.

If the patient has no visual symptoms or there is advanced glaucoma, I offer trabeculectomy with mitomycin C utilising releasable sutures following safe surgery technique. This will require the patient's compliance to attend the clinics for four weeks. I remove the releasable suture after two weeks if required. Steroids are titrated to make sure the morphology and function of the bleb is maintained without causing any cystic changes.

If the patient has had a previous trabeculectomy, has bulbar conjunctiva scarred or not freely mobile superiorly secondary to any surgery, I would offer an aqueous shunt using Baerveldt tube 350 and scleral graft with 3 "0" Supramid suture stent and absorbable vicryl ligature to the tube under the graft. If the patient suffers from chronic uveitis with a tendancy for low IOP, I use Baerveldt 250 or Molteno tube with scleral graft. During this time immediate hypertensive phase and its effect on the already damaged optic nerve should be considered intra and postoperatively. In the first few weeks one could use carbonic anhydrase inhibitors or prostaglandins. If IOP is too high I use external cycloidode laser before removing / adjusting the supramid stent, around 10-12 weeks post initial surgery.

If the patient is not suitable for major surgery, I use external cylodiode laser to ablate the ciliary body. This technique usually reduces aqueous production which gives short to medium term reduction of IOP.

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