Diagnosis & Management of Keratoconus

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No financial disclosures

R/O Cataracts

- Careful slit lamp exam but mostly subjective
- Can do PAM

Amblyopia - causes

- Uncorrected tropia
- Unequal refractive error or severe bilateral refractive error
- Congenital cataract, central corneal opacity

Billing: 2 choices

- Today as Vision Plan exam and return to confirm diagnosis of keratoconus
- Convert today into medical and confirm diagnosis today

Classic categories of keratoconus

- Nipple
- Oval
- Globus

Symptoms of Keratoconus

- **Blurred vision/distortion**

Symptoms of Keratoconus

- **Diplopia**

Symptoms of Keratoconus

- **Glare / halos around lights**

Conditions often mistaken for keratoconus

- "Regular" astigmatism
- Amblyopia
- Unexplained vision loss

Keratometry findings for keratoconus

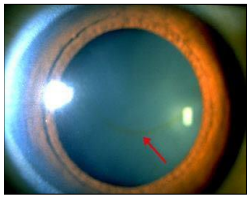
Distorted mires

Oval mires

Non superimposable central rings

His Slit Lamp Findings
Munson's sign

Other Slit Lamp Findings
Fleischer's ring



Other Slit Lamp Findings
Vogt's striae

What is normal corneal thickness?

Pachmetry findings for keratoconus

Early keratoconus 506 Microns

Moderate keratoconus 473 Microns

Advanced keratoconus 446 and below

How thin is too thin?

Risk Factors for perforation

Rheumatoid Arthritis

Eye rubbing

Ocular trauma

Treatment for perforated cornea

- Small perforations
  - Surgical glue
  - Bandage contact lens
  - Amniotic membrane
- Larger perforations
  - Surgery

Billing for today

- Intermediate exam (92012)
- Corneal Pachymetry
- Corneal Topography
- Ant seg photography if available

Cataract surgery and keratoconus

- Post op refraction more variable
- Things to avoid: Toric and Multifocal IOL
- Educate patient will likely need a refit of GP once post op done

ACG – classic signs

- Increased IOP
- VA hazy
- Pt has headache and/or nausea
- Mid fixed pupil
- Steamy cornea

Acute hydrops

Acute corneal hydrops is caused by the acute disruption of Descemet's membrane in the setting of corneal ectasia.

Hydrops denotes the abnormal accumulation of fluid

Clinical Presentation

Conjunctiva/sclera: Diffuse 1+ injection

Cornea: Inferior conical protrusion, focal area of massive inferior corneal edema with overlying microcystic edema and bullae, epithelium intact, no infiltrates or keratic precipitates

Anterior chamber: Deep, rare cell

Iris: Normal architecture, dilated

What % of patients with keratoconus get acute hydrops?

Roughly 5-10%

Most significant risk factor

Eye rubbing

Management

- Most cases of acute corneal hydrops spontaneously resolve over 2-4 months
- If that is the case, why do we Rx?

Acute hydrops

Hypertonic sodium chloride to reduce epithelial edema

Cycloplegic for patient comfort.

Topical steroids to help reduce the inflammation and subsequent neovascularization that can accompany these episodes.

A large diameter bandage contact lens can be placed for comfort.

Intacs

- Originally a refractive surgery procedure
- Goal: Make the corneal more suitable for GP fit

Penetrating Keratoplasty

- In 1905, the cornea was the first solid tissue ever to be transplanted successfully
- Is now the second most common tissue transplant done in the U.S.

Where do the corneas come from?

- Are harvested from donors within 24 hours after death and can be stored for up to 14 days after procurement

How many corneal transplants per year?

46,000

Post Op

- Eyedrops for months, years, and sometimes forever
- Fluctuating, hazy vision for months

Astigmatism after PKP

- Refraction may be difficult or imprecise in these patients
- The vast majority of patients are left with residual astigmatism
- What percentage of patients will need a GP after a PKP procedure?

What is the average of age of patient undergoing corneal transplant due to keratoconus?

29.5

What is the overall success rate of PKP?

But…

Definition of Success: Clear graft at 90 days

What is the 1 year survival rate for a cornea after transplantation?

91%

What is the 10 year survival rate for a cornea after transplantation?

50%

Treatment

- URGENT referral to surgeon/corneal specialist
- Patient will get lots and lots of steroids
- Drops
- Periocular
- Oral

Graft Rejection vs Failure

What signs should you warn a patient about post PK?

- R – redness
- S – sensitivity to light
- V – vision changes
- P - pain

PKP

This surgery is life changing for most patients – good and bad

Exhaust all options before you send your patient for this procedure

Management Options

- Eyeglasses
- Soft contact lenses
- GP
- Piggyback – GP fit over a SCL
- Scleral lenses

What patient groups demonstrate progression of keratoconus?

Kids
Pregnant women

Main Goal

To Slow or halt the progression of keratoconus

Contraindications

- Corneal thinning less than 400 nm
- Prior herpetic infections
- Corneal scarring or opacification
- H/O poor wound healing
- Autoimmune disease

Postoperative treatment:

- **BCL**
- **0.1% prednisolone 3 times/day**
- **Ciprofloxacin 4 times/day**
- **Artificial tears hourly**

Recommended PO visits

- Day 1 – obvious complications
- Day 3-4 – remove BCL
- 1 month – early refraction
- 3 months - refraction
- 6 months
- 12 months

Patient Expectations

- Discomfort for several days
- VA return to baseline 1-3 months
- Costs $3000 to $4000

Complications

- **Delayed corneal reepithelization**
- **Infection**
- **Corneal endothelium cell damage – in thin corneas**
- **Keratouveitis**
- **Severe corneal haze**

Problem

- Can't get perfect three point touch
- CLEK found most common mistake was fitting too flat

Kconus fitting

- You are done…
  - As close to three point touch as possible
  - Doing no damage to cornea
  - Lens is comfortable to wear
  - Vision is sufficient for patient's needs

Problem:

- Patient is GP intolerant

Your definition

- Patient is not able to tolerate CL for the amount of time he/she wishes to wear them

GP Intolerance/Poor fit

- The percentage of patients who are truly GP intolerant is WAY over-rated
- How to do you decrease the incidence of GP intolerance in your practice?

Ways to avoid GP intolerance

- Be liberal with punctal plugs, artificial tears, and/or allergy drops

Ways to avoid GP intolerance

- Use large diameter lens

Ways to avoid GP intolerance

- Make sure patient is properly motivated
- 1. Wait for vision to be bad enough to motivate the patient to work through the discomfort
- 2. Make sure your fees are high enough
- 3. Talk to the patient about surgery

For every surgery…

- Weight risk/benefit ratio to see if patient is actually a good candidate
- This should be done prior to sending a patient for a surgical consult