Pediatric Keratoplasty

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Intorduction

- Pediatric keratoplasty presents unique challenges that are distinct from adult keratoplasty.
- The aim of this operation is to clear the visual axis to prevent deprivational amblyopia.
- Owing to the high failure rate pediatric keratoplasty achieve its importance.

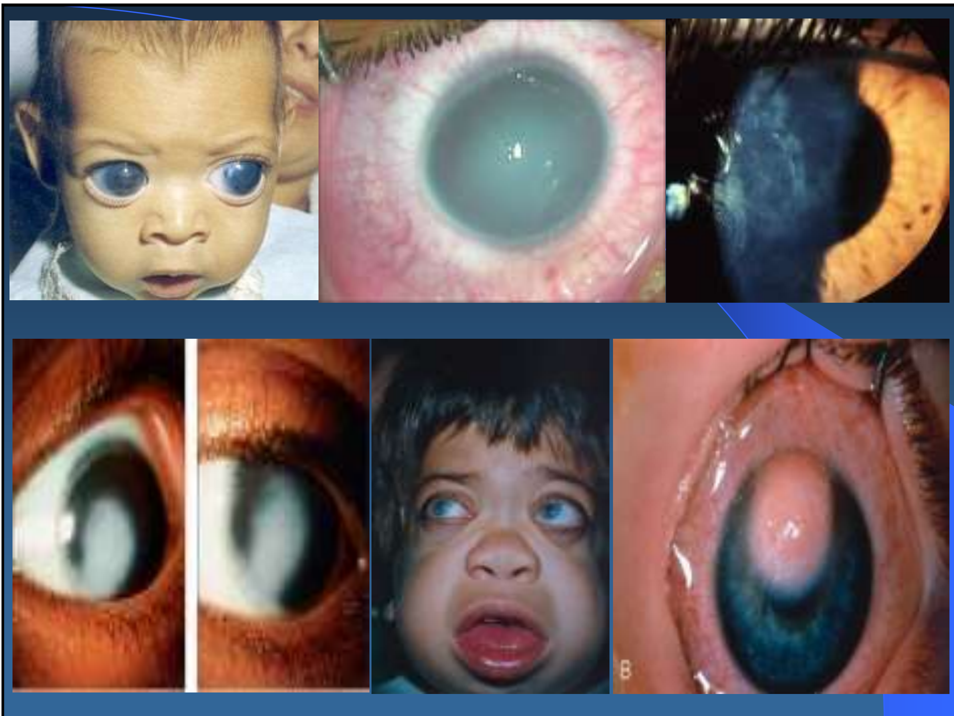
Aetiology
pediatric corneal opacity

Congenital
(common in developed countries)

- Cong. glaucoma ★
- CHED , CHSD ★★★
- Peter`s Anomaly ★★
- Post Polymorphus dystrophy ★★★
- Disorders of metabolism ★
- Dermoid ★★

Acquired
(common in developing countries)

- Traumatic
- Non Traumatic



Acquired

"Common in developing countries"

Traumatic

- Penetrating & non penetrating Trauma

Non Traumatic

- Infectious keratitis
- Interstitial keratitis
- KC
- Exposure Keratopathy

Challenges

- Visual out come?
- To operate or not ?
- When to operate?
- Operative Challenges
  - Pre Operative assesment
  - Intra operative maneuver's
  - Post operative considerations

Visual outcome

- Several factors affecting visual outcome
  - Time of surgery
  - Associated comorbidity
  - Aetiology of the opacity (Cong , Acquired)

To Operate Or Not ?

- Indicated eye :

  is the term prescribing any eye(s) with significant corneal opacity with normal size and structure….. But eye(s) with bilat. opacities and complex ant.segment comorbedities has high failure rate.
- Aim of surgery :

  is to clarify the visual axis to promote functional visual development.

When To Operate ?

A. In Bilat. cong. corneal opacities : within 3 months of age.
- 1st eye at the age of one month.
- 2nd eye at the age of 2 months.

B. In Asymmetrical corneal opacities + fair prognosis within the affected eye “It is Better not to operate“.

C. Late presentation or advanced pathology → very poor prognosis.

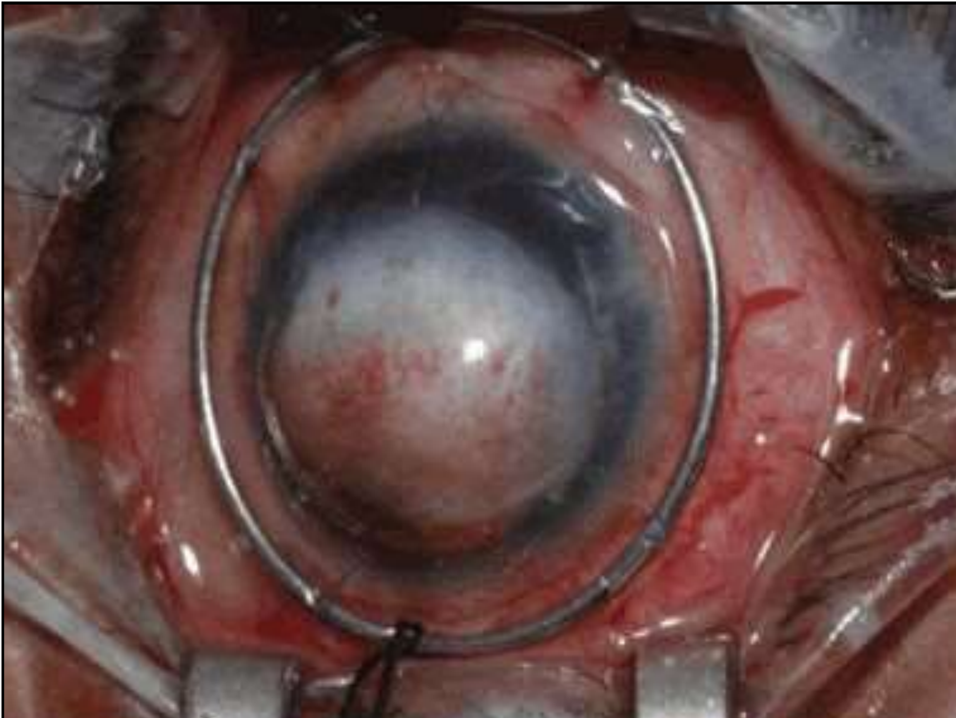
D. Compliant family is Critical.

Operative challenges

- A) pre operative assesment By
  - **History**
    "family & Perinatal history"
    - Medications during pregnancy
    - Gestational age & birth weight
    - onset & course of corneal opacity
  - **Examination**
    "EUA & Portable Slitlamp"
    - Fixation behavior & nystagmus and APD
    - Lid , cornea, AC, Iop 'Tonopen' and fundus
  - **Investigations**
    - UBM
    - A & B Scan
    - VEP

operative challenges

- B) Intra Operative Manouvers
  - GA + Slight Head up + IV mannitol.
  - Lateral canthotomy "if needed".
  - Small Sized cut 6-7 mm.
  - Large Size Donor Tissue 0.5-1 mm → ↑ Ac depth → ↓ Ant. Psynechia.
  - Flieringa ring is important to stabilize the globe as there is ↓ scleral rigidity (2 mm From the limbus + vicryl 6/0)
  - Intra cameral miotics.
  - VE can be injected to lyse preexisting irido corneal edhesions.



operative challenges

- Peripheral Iridectomy is preferable.
- In peters anomaly 4 Iridectomies are needed to limit the progression of PAS.
- Water tight wound by :
  - 16 interrupted stitches with Nylon 10/0 "method of choice" OR
  - Running suture Technique with SC. antibiotic & steroid injection.
- Firm pad & shield at the conclusion of surgery.

Associated Surgeries

- If ped. keratoplasty is associated with another surgical procedure this means → poor graft survival.
- The most common associated surgery is Lensectomy that necessitate.
  - Post, capsulotomy
  - Ant. Vitrectomy
  - P.I
  - All Vitreous in AC should be removed.

Associated Surgeries

- 2nd opinion :

  is to stage the surgery i e. Remove the lens with preservation of the post capsule then parsplicata closed capsular removal is done 4 weeks later.

Post Operative Considerations

- Consider non communicable child by frequent monitoring (48h , 1 week → month, Monthly for a year) by EUA if needed.
- Consider non compliant family by instructions.
- Consider Adequate drug instillation.
  - AB.
  - Steroids With higher doses & slow trapping .
  - Cyclosporin 2% is beneficial in cases where graft rejection is expected.
  - Cycloplegic → discontinued once inflam. controlled

Post Operative Considerations

- Consider early suture removal "4 weeks" as The child is young & late suture removal at older age group :

  < 5 ys → 1st three months.

  > 5 ys → after 6 months.

- Consider Amblyopia therapy by :
  - Early refractive correction (anisometropia & astigmatism).
  - Regular follow up of the refractive status with aggressive Amblyopia Therapy (family instructions).

Complications "3 Gs"

- Glaucoma
- Graft Failure
- Graft Rejection

Glucoma

Causes :

a) Steroid induced
b) Synechia.
c) Dysgenesis associated (peter`s anomaly).
d) Inflammation.
e) Trabecular collapse.

Treatment Of Glaucome

- Preoperative : by goniotomy or trabculectomy with Antimetabolite or shunt system if dysgenesis is present.
- Postoperative : either by
  - Medical
    - B-blockers.
    - CAI.
    - PG Analogues.
  - Surgical by
    - Goniotomy.
    - Trabeculectomy.
    - Glaucoma drainage procedures.

Graft Failure

- Risk Factors

  Includes :
  - Young Age
  - Cong. Corneal Opacities.
  - Associated Ant. Segment anomalies.
  - Vascularized Cornea.
  - Concurrent Surgical Procedure.
  - Re-grafting.
  - Post Operative Complications as :
    - Epithelial defect
    - Infectious Keratitis
    - Glaucoma and RD

Graft Failure

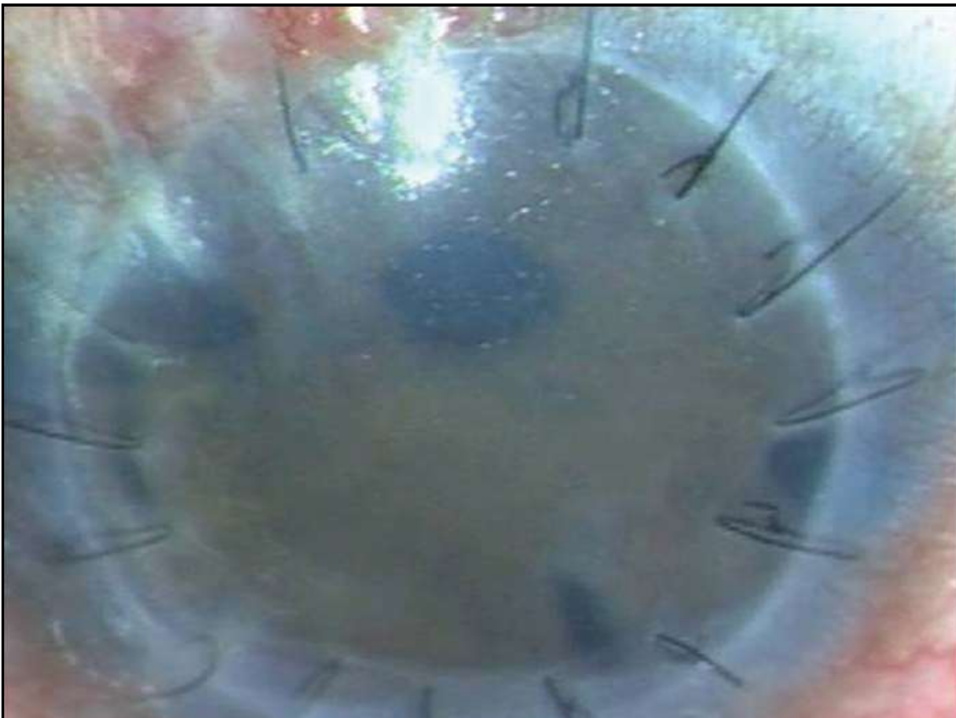
- Graft Failure occur most Commonly within the 1st post-op year. The period at which the child should by regularly Monitored
- Management
  - Intensive Topical steroid should by tried.
  - If not re-graft but in patients with high risk factors Consider Re-grafting from the start.

Graft Rejection

- Signs :
  - Cloudy graft that was previously clear
  - Persistent AC reaction
  - Diffuse epithelial edema

BUT :

- ➢ KPS & Khoudaduot Lines are less commonly seen in pediatric age group.
  - TTT
    - ➢ Intensive Topical steroid / h.
    - ➢ Cyclosporin 2% ED.
    - ➢ In sever cases oral steroids "1mg/kg/day“.



Alternatives To PKP

- Minimal invasive Technique in less sever opacity as optical Iridectomy.
- Consider DSEK in CHED “inspite of its difficulties“.
- Consider DALK in Isolated stromal opacities Like opacity of infectious keratitis , mucopolysaccharidosis , central dermoids and KC (faster visual recovery).
- Consider Keratoprosthesis in multiple graft failure inspite of its disadvantages & Complications