Pediatric traumatic cataract
Presentation and Management

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Management of Traumatic Cataract

Ocular trauma presents many problems

First is to restore integrity of the globe

Visual axis to be cleared

Optical correction

Amblyopia
Pathophysiology

• Blunt Injury
• Penetrating Injury
Blunt trauma
Penetrating trauma
Different scenarios...

When, How and along with what...!
Issues involved...

1. Cataract management at the time of primary repair.... ?
2. Timing between trauma and cataract surgery...?
3. IOL – implantation...? Primary /secondary....?
4. IOL– implantation ... Position...?
5. Additional procedures... iridodialysis repair, glaucoma surgery, vitrectomy...etc
6. Patient Counselling and Medicolegal issues
Different scenarios...

5/f – Iron nail injury – 2 days
11/m – 1 week – nail injury
2/m – 1 week iron rod injury
8/m – Bicycle handle injury – 3 months
2 days post primary repair
Cataract management during primary repair..?
POLL - 1

Cataract management during primary repair - Will you do it...?

1. Always
2. Never
3. Sometimes
Cataract management during primary repair

- **If No...**
  - Why not ... ?
  - Open globe
  - Emergency state
  - Availability of expertise and infrastructure
  - Risk of inflammation and infection
Cataract management during primary repair

- **If Yes …**
  - **When …?**
  - **Why …?**
  - **How …?**

- Breeched anterior capsule
- Lens matter in AC
- Avoiding multiple surgeries
- Early rehab
- Posterior segment assessment
So...

- Cataract surgery during primary repair
  - BEST AVOIDED
  - Done ONLY if …
    - Large breach in Anterior capsule
    - Lens matter in AC
IOL implantation during primary repair...?
Do you consider IOL implantation during primary repair?

- Yes
- No
IOL implantation with primary repair

- BEST avoided
  - Chance of infection
  - Biometry issues

May be done in very select situations
Case scenario

6/F - Iron nail injury
2 days back

2/M - Stick injury
1 week
If Cataract is NOT managed during primary repair

Then when … ?
Timing between trauma and cataract surgery
Timing between trauma and cataract surgery...

**When do we do it ?**
- Next day ?
- Next week ?
- Next month ?

**What other factors decide it ?**
- Age
- Intra ocular pressure
- Inflammation
Timing between trauma and cataract surgery...

Primary repair done – 2 days back
Lens aspiration + anterior virectomy
Different scenarios...

5/f – Iron nail injury – 2 days

11/m – 1 week – nail injury

2/m – 1 week iron rod injury

8/m – Bicycle handle injury – 3 months

2 days post primary repair
Cataract surgery done – but IOL?

- Which …?
- When …?
- IOL power calculation …?
- Other issues…
IOL power calculation – In the past

- Fellow eye K → DBR was considered
  - Hyperopic/myopic
  - Axial length differences
  - Fellow eye corneal pathologies
- Disadvantages irrespective of fellow cornea being normal/not
- IOL power availabilities also is an issue
- Other methods of rehabilitation – Contact lenses
Challenges in DBR...
How will you do biometry in case of corneal trauma?

1. Manual keratometry?
2. Topography?
3. SIM Keratometry?
CORNEAL INJURY

- PRIMARY CORNEAL TEAR REPAIR
- TRAUMATIC CATARACT
  - LENSECTOMY
  - CONTACT LENS

- SUTURED CORNEA
  - SUTURE REMOVAL
  - 2 WEEKS TO HEAL
  - SECONDARY IOL
  - MANUAL K / TOPO SIM K
CORNEAL SCAR

CLEAR MIRES
- MANUAL K

DISTORTED MIRES
- TOPO SIM K

VERY DISTORTED MIRES
- STD K

Routine cases
Commonly done
Rarely done
IOL power calculation – Take home point

• Fellow eye K method – NOT a good option
• Topo Sim K commonly used method
• Ideal to plan biometry after suture removal
• Contact lens trial before planning secondary IOL implantation
Yes.. I am going to insert IOL

• What IOL ...?
• Where ...?
IOL implantation...

• Primary or Secondary?
  – What factors decide?
  • PC Status
  • Age
  • Corneal sutures
  • Others..

Primary IOL placement
Timing - cataract surgery, IOL implantation
• (48 eyes) was implanted with aspherical IOL and the control group (48 eyes) was implanted with traditional sphere IOL.

• Aspherical IOL is more appropriate for the patients with small and peripheral corneal scar.
• 687 patients – mean age – 27.1 +/- 18.54 years
• Open globe : closed globe – 496 : 191
• > 20/60 vision – 58% of open globe, 39.1% of closed globe
• Better outcome when intervention was within 2 – 30 days or trauma
• 354 eyes – age range: 0 – 18
• 2 groups: Open globe – 287; closed globe – 67 – Results analysed and compared
• Cataract management was secondary in the presence of corneal wound
• 219 eyes received IOL
• Primary IOL implantation was avoided in children less than 2 years
• Ideal timing 5 – 30 days after the trauma in adults
• No difference in the visual outcome whether IOL inserted as primary or secondary procedure
• 117 patients, age range 1.3-13.8 years
• 68 open-globe injury patients - 47 eyes (68.12%) had primary IOL implantation
• 18 eyes with closed-globe injuries - 17 eyes (94.4%) had primary IOL implantation
• Sec IOL implantation – 4 +/- 2.54 months later
Summary...

• Timing between trauma and cataract surgery – dependant on various factors like age of patient, IOP, inflammation

• Surgical technique.. Varies

• IOL power calculation is a major challenge
  – Topo Sim K and Standard K → best results

• *Ideal timing 5 – 30 days after the trauma* in adults

• No difference in the visual outcome whether IOL inserted as primary or secondary procedure in adults
So.. IOL we’ll place .. But where ?

- In the bag
- In the sulcus
- ACIOL
- SFIOL
- Glued IOL
IOL – Where and How do we place it?
IOL placement – other options?
• Single-point fixation of CTS – 6 – 8 clock hours of dialysis
• Double-point fixation for 9 – 12 clock hour dialysis
• Cionni ring / segment inserted after hydrodissection before the phacoemulsification but fixing the sutures after IOL
• Of 41 eyes
  – 38 (92.7%) could retain the capsular bag
  – 36 had BCVA – 20/40 at 4 weeks , 18 at 1 year follow up
  – 13 had glaucoma of which 7 angle closure – only one needed surgery
• Three patients with zonulysis and phacodonesis underwent surgery with this technique

• Lens dislocated by more than 180°

• Safe and effective in terms of lens stability and visual rehabilitation
Anterior chamber, iris-fixated, and scleral-fixated lenses → all viable options when used appropriately in the setting of inadequate capsular support.

Injury to the iris and anterior segment structures precludes the use of angle supported or iris-sutured fixation.

Scleral fixation strategies for IOL placement after trauma.
• Glued ECR/segment stabilizes the capsular bag intra and post-operatively.

• A glued versus sutured ECR/ECS will be more viable and stable on the sclera in the long term.
• 735 eyes with glued IOL
• IOL optic-related complications included optic capture and decentration
• Haptic extrusion, haptic dislodgement, broken haptic and sub-conjunctival haptic
Trauma and “rings”...

< 180 deg – Rings and in-the-bag IOL

> 180 deg – Scleral fixated IOL’s
NON – cataract’ers role...
Cataract PLUS...

• Optical iridectomy
• Iridodialysis repair
• Glaucoma surgery
• Vitrectomy
• PK
POLL - 4

• Associated iris issues... when do you manage?
  • Concurrent management..?
  • Staged management..?
Cataract PLUS...

• Optical Iridectomy
  – Which situations?
  – Preferred position?

• Penetrating Keratoplasty
  – When?
Pupilloplasty - Iridectomy
Iridodialysis ...

- **Iridodialysis**
  - ?To do at all?
  - If so when?
  - Before or after cataract extraction?
  - Technique
A quick minute on investigations...

Investigations ...

• Schlemfeg’s imaging – cataract density
• UBM – high performance 35Hertz superior
• AS OCT – upto the level of the anterior capsule
Carry home...
To sum up...

- Cataract management is best avoided at the time of primary repair except in limited situations.
- Ideal timing of cataract surgery following trauma is between 1 week to 1 month in adults.
- In the amblyogenic age group, it's crucial to plan clearing of visual axis with utmost priority.
- Important to weigh risks of amblyopia due to aphakia vis a vis uncorrected astigmatic anisometropia due to DBR issues.
- Primary implantation of IOL has undebatably the best visual outcome at ALL age groups.
To sum up …

• **Concurrent issues** like iris trauma, glaucoma etc need simultaneous planning and management

• Very important to be aware of **long term issues** like glaucoma, retinal complications and sympathetic ophthalmia

• Patient counselling: Taking them into confidence, balancing reassurance and explanation of the guarded visual prognosis plays an important role in ultimate outcome

• Medicolegal issues
Aal eezzz welll ....

And hope he lives happily ever after..
Thank you
Simultaneous corneal laceration repair + ECCE + PCIOL was done in 7 patients

- Average follow-up \( \rightarrow 10\frac{1}{2} \) months
  - All patients achieved visual acuity of \( \geq 20/40 \) with spectacle correction

- YAG capsulotomy \( \rightarrow \) only additional procedure
  - NO other complications attributable to the surgical procedures

- Authors believe that certain lacerating injuries of the anterior segment are particularly amenable to cataract extraction and lens implantation at the time of primary laceration repair

- This approach obviates additional operative and anesthetic risks, while affording more timely visual rehabilitation
• 30% of perforating injuries have lens damage

• 27 cases with a perforating corneal injury and lens damage were alternatively treated
  – either with simultaneous corneal suturing and cataract removal or
  – with corneal suturing and delayed cataract removal several weeks later

• Difference in the frequency of complications between the 2 groups was significant.

• The 1-step procedure was technically easier to perform, period of postoperative irritation was shorter, complications due to the presence of an injured lens were prevented and visual rehabilitation occurred earlier
• Timing of cataract surgery and IOL implantation in the setting of trauma → debatable

• Cataract management at primary repair
  – Inflammation and IOP issues
  – Advantages
    • Visualization of posterior segment and optic nerve
    • Clearing visual acuity in children (amblyopia)

• Second sitting management – better outcome
  – Quiet eye, Stable wound and IOL calculation easier
Case scenario

8 year old boy with injury with bicycle hand bar – 3 months

Elective surgery

24 year old male with iron rod injury 15 days prior

Now !