VISION 2020 e-resource

-for eyecare management worldwide

Cataract Surgery Protocol

Cataract Surgery Protocol
(Preoperative, Surgery and Postoperative)

Standardized pre-operative protocol for cataract surgery

The following were standardised by the participating hospitals cataract surgery protocol, which includes pre-operative, surgery and post-op procedures

1. Admission: Admission is done one day earlier or 4 hours prior to surgery on the day of surgery

- Checking of Xylocaine sensitivity (Optional).
- Patient is seen by the ward duty Doctor/Nurse.
- Slit lamp examination in detail and to look for conjunctival congestion, discharge, cornea, AC depth, lens maturity (in Phaco cases) and phacodonesis. Posterior segment evaluation of both eyes.
- Asking history of systemic illness/ allergy to drugs.
- Confer with physician if necessary.
- To explain about possible conversion to routine ECCE with IOL in cases with small pupil and advanced nuclear sclerosis who want phacoemulsification.
- One-eyed patient should be given extra day of topical antibiotic.

2. Investigations

a) Routine Investigations: For all cases

Tension,

Duct (optional)

Blood pressure

Urine sugar

Blood sugar (optional)

ECG for adults (optional)

Chest investigations (optional)

b) Additional investigations: For GA cases

Blood Count, HB%

ECG for adults, chest x-ray (optional)

Weight of the patient

Check up by anesthetist.

c) Conjunctival culture report is required in the following cases

- One eyed patients
- DCT done before cataract surgery
- History of chronic infection eg. Blepharitis
- Duct not free & partially free with clear fluid
- Uncontrolled diabetes mellitus
- Any history of previous intraocular surgery (preferably)

d) Physician's opinion essential

- Uncontrolled DM & HT cases
- Known cardiac problems
- Other systemic problems if any (To be decided by doctor)

3. Decision Making on patients with systemic diseases.

a) Diabetes

- Criteria for admission

RBS < 160 mgs %

- Criteria for surgery

Urine Sugar nil/1+
With FBS < 160 mgs % (160 – 180 mgs%)

b) Hypertension

- Criteria for admission

BP up to 160/90 mm hg
if >170/100 - Physician opinion

- Criteria for surgery

Diastolic pressure ≤ 100 mm hg

c) Cardiac cases

- Criteria for admission

A recent ECG & clearance by physician concerned
Surgery to be undertaken a minimum of 6 months after myocardial Infarction

d) Asthmatics

- Criteria for admission

Asthma should be controlled with drugs
To continue the medicines during hospital stay

e) Dental infection, history of purulent discharge, or any septic focus. Treat adequately before surgery.

4. Premedication

-Topical antibiotic: 6 – 8 times previous day and hourly on the day ofsurgery (preferable antibiotics – Ciprofloxacin or Gentamycin)

- Diazepam 5 mg: Previous night (optional)
- Diamox – 2 tablets one hour before going to OT (optional)

5. Instruction regarding dilatation

- Non - HT - Tropicamide with phenylephrine 1 drop every 15 min. 2 to 3 times
- 1% cyclogic 1 drop every 15 min. 3 times
- Flur eye drops 3 times every 15 min.

6. Patients cleanliness

- Head bath and shaving previous night
- Hair cut if necessary previous to surgery
- Clean clothes to be worn
- To avoid applying kumkum, ash to the forehead

7. Day of surgery

- Anti-diabetic medication to be decided according to food in take
- One eyed and diabetics patients to be given preference in surgery list
- Clean clothing to be worn by the patients
- Operation theatre gown to be worn by the patient
- Light food before surgery advisable
- Constrict pupil for secondary AC IOL

PRE-OPERATIVE PROTOCOL FOR OTHER SURGERIES

DCR:-
Hb, BG, BT, CT and ENT opinion to be taken, and rule out systemic diseases if any (as mentioned before)

DCT:-
Control of systemic diseases if any.

Retinal surgery:

- Physician's clearance is a must for all cases
- Well dilated pupil
- Pre-medication to be given before surgery
- Patient to be shifted on the stretcher
- Fundus diagram picture is a must

GLAUCOMA SURGERY

- Don't dilate for Trab + Trab, Trab, phacomorphic glaucoma.
- IV mannitol to be given if the IOP is more than 25mm HG.
- To stop Pilocor 2 days prior & Propine to the operating eye at least 7 days prior.
- To use T. Diamox & Flur to stabilize blood aqueous barrier
- No massage for any re-surgery or where any other Intra – ocular procedures have been done.

PEADIATRICS

- To see general condition of the child
- To look for systemic congenital deformities
- To note the age of the child at the time of presentation
- Ask for history of previous anesthesia or surgery
- HB, RBC count and weight of the baby to be taken
- Patient to be seen by GA nurse and the doctor posted in pediatric clinic before and after surgery
- To get GA consent form signed
- Fasting for minimum 6 hours prior to surgery

CORNEA

- PKP - In phakic patient when cataract surgery is not planned pupil to be constricted with pilocarpine
- If cataract extraction is also planned with PKP, pupil to be dilated
- TKP and penetrating injuries - facial block first and then ciliary block to be given. Avoid repeating the block. No massage to be given.
- Pterygium excision with conjunctival transplantation and bowman's cautery - both ciliary and facial blocks are necessary

SURGICAL PROTOCOL FOR CATARACT SURGERY

1. Block Room

- Block room doctor should wash his hands
- Checking of emergency kit (adrenaline, atropine, deriphylline, dexamethasone, hydrocortisone, phenergan, mephentin, diazepam, O2 cylinder with kit, I V Kit, syringes, plaster, scissors, I V normal saline, Intubation kit, Suction apparatus, etc)

2. Selection of Anaesthetic solution

- To all normal patients 2% Xylocaine with adrenaline (1:100,000) with 1 amp. Hyalase

- To patients with hypertension and cardiac diseases 2% xylocaine with 1 amp hyalase with Sensorcaine (1:1)

3. Quantity of anaesthetic solution

- For facial block - 4cc

  &

- For retrobulbar block - 3cc
- For peribulbar block - 5cc

4. Needles

- For facial & peribulbar block - No.24, 1" disposable needle
- For retrobulbar block - No.23, 1.5 " Hypodermic needle

5. Sterilization of needles

- Autoclaving of both the above needles for 20 min / disposable needle.
- To keep adequate needles ready to decrease waiting time.

6. Checking the case records

- Confirm the name of the patients. If you find two or more with the same name, confirm patient's relative and relationship. Eg. W/O, H/O, F/O, M/O, S/O, D/O.
- Confirm the eye to be operated
- The type of surgery to be performed
- The type of cataract
- Vision with refraction
- Tension & ducts
- IOL power & size
- Check whether stickers are attached and completeness of record
- Recheck for specific systemic diseases (eg. asthma, etc.)
- Any systemic diseases like DM (Diabetes Mellitus), HT(Hypertension), IHD (Ischemic Heart Disease)
- Any complicating conditions like – PXF (Pseudo exfoliation), sub-luxated lens, rigid pupil etc.
- Whether diabetes controlled - FBS < 140mg%
  BP < 100mmhg diastolic and < 160mmhg systolic

7. Anaesthesia

- Retrobulbar + facial block
  or
- Peribulbar block

8. Hypotony

- Massage is to be either digital or by super pinky.

Contra indicated in
- Sub-luxated lens
- Re-surgeries
- Perforating injury

Vigorous massage avoided in
- PXF
- Myopia
- Traumatic cataract
- Hyper mature cataract
- Corneal status, anaesthesia and akinesia checked

9. I.V. MANNITOL

Indications

- IOL exchange/explants
- Subluxated cataract
- Associated with R.D, VH (optional)
- Traumatic cataract
- Secondary IOL
- In recommended Glaucoma cases
- 2.5 cc per kg body weight of 20% mannitol to be given about half an hour before surgery
- Avoid in uncontrolled HT, cardiac patients, and renal diseases
- Before starting drip check BP, CVS examination
- Patient is moved on the stretcher and is told to avoid ambulation for 6 hours.

10. Informing the surgeon

- Inform the operating surgeon in case of any complicating condition.
- Inform if surgery other than cataract / IOL
- Patients with the same name, check the address in details & also the eye examination findings

11. Decision regarding postponing the case

- DM - RBS > 160MG%
- BP - diastolic > 100mmhg, systolic > 160mmhg
- Severe wheezing
- Any complication of local anesthesia
- Positive conjunctival cultures
- Local factors - any infection of lids and adnexa
- IOP of more than 30mmhg in spite of all medications except lens-induced glaucoma.

12. Managing Anaesthetic Complications

i. Vasovagal syncope

- This is the commonest complication
- The patient is to be made to lie down in supine position and the legs raised up. The room should be airy.
- The patients clothes should be loosened

- Monitor pulse and BP
- Give IV atropine one amp. If there is bradycardia or hypotension.
- To keep resuscitation equipment ready like - oxygen cylinder, endotracheal tube, laryngoscope, ambu bag, scalp vein set, emergency drugs.
- Periodic check of expiry dates of emergency drugs.
- To inform anesthetist or physician if patient does not have adequate recovery.

ii. Seizures

- Make patient lie down
- Turn face to the side
- Insert a mouth gag
- Intravenous diazepam if required
- Oxygen therapy

iii. Retrobulbar haemorrhage

- Pressure pad and bandage
- Start patient on diamox, check tension
- Lateral canthotomy if required
- Postpone surgery
- If possible fundus examination

SURGERY

1. The Patient

- Check the name of the patient and go through the case sheet

2. Scrubbing & Draping

- Betadine drops at least 5 min. before surgery
- Eyebrows and eyelids cleaned properly with Betadine
- Plastic drape to be used preferably

3. Speculum

- Wire speculum preferred in deep sockets

4. Bridle suture

5. Conjunctival flap

- Fornix based flaps of conjunctiva is preferred
- First conjunctiva and then tenon's capsule separated
- Conjunctival section should be equal or just more than the corneal section

6. Cautery

- Contra indicated, old scleritis & Scleral thinning

7.Section

- Avoid single plane sections
- Best is 2 or 3 planed sections
- Ideal site superior mid limbal
- Size - 11 to 12 mm

Large sections are preferred in one or more of the following

i. Soft eye	ii. Black nucleus
iii. Myopia	iv. After surgery for retinal detachment
v. Elderly patient	vi. Small rigid pupil (e.g., PXF)

Smaller sections are preferred for younger patients.

8. Use of viscoelastics (VE)

- Use VE in all cases.

9. Capsulotomy

- 6MM can opener
- or Linear Capsulotomy
- or Capsulorhexis

10. Nucleus delivery

- The manual method is preferred

- Very soft eye – Hydro dissect - take nucleus into anterior chamber, extract with irrigating vectis.

11. Irrigation and aspiration

- Simcoe canula is used
- Positive pressure cases - closed chamber aspiration or dry visco aspiration should be done

12. IOL insertion

- Single piece, biconvex, all PMMA, modified C loop, without hole, is preferable (size 6 - 7mm optic, 13-14mm length)
- under air or visco elastic
- Put suture if there is positive pressure before implanting the IOL.

13. Sutures

- Equal bites equidistant, radial sutures/ continuous sutures
- Adequate tightness
- No. of sutures corresponding to section
- Trimming of sutures
- Undermine 9-0 or 10-0 sutures

14. Subconjunctival injection

- 1/2 cc. Decadron + 1/2 cc. Genticyn is used. If tissue handling is less Decadron can be avoided.
- Injection to be given in the inferior fornix.

Small Incision Cataract Surgery

1. Conjunctival Section:

- Proportionate to the size of tunnel (6 to 6.5 mm)

2. Scleral Tunnel:

- Size: Proportionate to the size of nucleus

3. Side Port:

4. Viscoelastics:

5. Capsulotomy:

- Rhexis preferred

6. Hydro Dissection

7. Nucleus delivery into AC:

- Cornea, Iris, Zonules, Posterior Capsule should be taken care.

8. Nucleus expression:

i. Irrigating Vectis

ii. Phaco Sandwich

iii. Phaco fracture

- Corneal endothelium and iris should be taken care

- Tunnel should be extended according to nucleus size

9. Cortex aspiration

10. IOL Implantation:

- If under Visco - It should be fully aspirated after implantation

11. Chamber integrity:

- If tunnel is leaking put adequate sutures
- If side port is leaking do stromal hydration

12. Proper repositioning of conjunctiva, may use cautery to reposition conjunctiva at limbus

13. After speculum and bridle suture removal check AC depth

14. Sub-conjunctival injection

Medical Supplies

- Ringer lactate in glass bottle to be autoclaved and cooled before use.
- IOLs both side should be washed before insertion
- Adequate precaution should be taken before reusing the suture
- One ampoule of adrenaline (0.5ml)

During Surgery:

Cardiac:

Routine medication to be continued

No adrenaline and phenylephrine

To provide stretcher or wheel chair

Cautery should not be used in patients with pace makers.

Stand by physician or anesthetist (optional)

Asthmatics

Special care for ventilation while draping

Use Oxygen during surgery if the patient is uncomfortable.

Inj. Deriphylline / Decadron 1 amp. IV, SOS

Switch off the Air-conditioner (optional)

POST-OPERATIVE MANAGEMENT

Routine Management of uncomplicated cases:

Planned ECCE with IOL / without IOL / Phaco

First dressing can be done 8 hours after surgery.

Look for the following findings (pupil to be dilated)

* Section - Apposition of Wound / Wound Leak / Gape
* Cornea - Epithelial Defect, Edema, SK
* A.C. (Anterior Chamber) - Hyphema, Hypopyon, Cortical Matter, Depth
* Iris - Iritis, Fibrinous reaction
* IOL - Centeration
* Pupil - Round, Mobility, Vitreous
* PC (Posterior Capsule) - Opacity, Rent, Vitreous disturbance
*Vitreous - Vitreous disturbance
-Red Glow

The main aim of postoperative examination in the morning is to look for any early sign of infection, as one has to withhold the steroids and start other intensive measures.

Routine Medication
As a routine Antibiotic and Steroid eye drops are applied four to five times per day. Mydriatic / Cycloplegic 1 time per day. Immediate post-op analgesic tablets.

On discharge:

Advise the patient regarding tapering dose of steroids.

4 times a day - 15 days

3 times a day - 15 days

2 times a day - 15 days

1 time a day - 15 days

Cycloplegics 1 OD for 15 days. (Optional)

- Precautions
- Medications
- S.O.S. Calls
- Routine follow up

Management of complications:

I) ***Lid Edema / Chemosis*** on the first postoperative day can be managed with NSAID. One has to look for signs of infection if associated with severe pain.

II) ***Wound gaping, Iris Prolapse, Broken sutures***:
As these cases require resuturing, antibiotic drops alone should be applied. If needed, patients may be started on parenteral steroids. Explain the condition, to the patient and about the second procedure.

III) *Cornea*

a) SK/DM Folds & Edema – Observation, Steroid Drops, Timolol if needed

b) DM Detachment - If large resuturing, Air Injection into Anterior Chamber with reposition of DM

c) Epithelial Defect - Antibiotic Ointment and Bandage. Review the next day.

IV) *Anterior Chamber*

a) Shallow AC

Look for integrity of the wound, intra ocular pressure and treat accordingly.

Examine Fundus- If due to Choroidal detachment, treat with systemic steroids. Drainage can be planned if needed, after 5 days.

b) Hyphema:

Give bed rest, Vitamin C, topical steroids. Hypothesizes (if necessary). Plan for AC wash SOS after 3 to 5 days.

c) Loose cortex:

- Irrigation and aspiration of the cortical material should be done under the following circumstances.
- If there is a piece of nucleus or epinucleus left behind
- If there is cortex behind the IOL
- If a large piece of cortex in AC is covering pupillary area

V) ***Iris***

Iritis: Mild / Moderate / Severe and fibrin membrane

If no infection, if only inflammation start steroids good dilation, S/C steroids and systemic steroids whenever indicated.

Hypopyon:
Clinical judgement as to whether it is inflammatory or infection is the first step.

If inflammatory start on intensive steroid treatment along with cycloplegic.

Endophthalmitis

Corneal Infiltration / infection: Intensive topical antibiotic treatment should be started preferably with Broadspectrum antibiotics. USG and Retina Clinic opinion/Cornea clinic opinion are to be obtained. An emergency Ac tap/Vitreous tap with intravitreal antibiotics should be planned.
(Vancomycin - Gram positive, Amikacin/Ceftazidime - Gram negative)

A frequent topical antibiotic drop (hourly or half hourly) is better than giving a sub. Conjuctival injection.

Systemic antibiotics may be started immediately.

Vitrectomy to be decided if there is no response to topical & intra vitreal injection

Pre operative culture report should be reviewed.
Fresh culture and sensitivity from conjunctiva can be taken, as very often the infecting organisms have been cultured from the conjunctiva. Recheck the patency of the Lacrimal duct and Diabetic status.

VI) ***Pupil:***
Peaking of the pupil is commonly due to incarceration of anterior capsular flap or vitreous in the wound or due to sphincter tear. Rarely it is due to haptic in AC or iris incarceration in the wound.

VII) ***IOL position:***
Look for centration, subluxation, and dislocation.

Haptic in AC:
Continue antibiotic eye drops, stop topical steroids and repositioning at the earliest.

VIII) ***Posterior capsular rent***:
With vitreous disturbance / without vitreous disturbance.

Management - If vitreous present in the wound vitrectomy should be done. All the vitreous should be removed from the wound.

Continue steroids for a longer time along with NSAID.

IX) ***Leucocoria or Poor vision with normal anterior segment***
Detailed posterior segment examination. USG

3.Timing of resurgeries:

1. Cases which have to be taken immediately.
    a) Haptic in AC
    b) Iris prolapse
    c) Broken sutures
    d) Wound gaping

2. Decentration (Clinical judgement to be used)

4. Routine follow up

Phaco
1st day – Slit lamp examination (SLE)

1st week - Vision pin hole, slitlamp examination and fundus examination. If vision less than 6/12 do refraction (RR), Fundus (F) to look for the cause.

1st month - Refraction, SLE - (F) if vision is good – glass prescription (GP), and follow up SOS. If visual acuity is not good look for CME.

Planned ECCE with IOL:

1st Week - Vn with PH, SLE (F)

4th Week – Vn with PH, SLE (F)
8th Week – Vn with PH, RR, SLE (F) & Suture removal if necessary.

If Vn is not good - look for cause, (F) refer to concerned department.

***Emergency Management*:**

1. Severe post-operative Iritis, emergency treatment should be started immediately.
2. Hypopyon - Clinical judgement inflammatory or infection? Treat accordingly.
3. Look for against the rule astigmatism and **weak wound** re-enforcement sutures SOS.
4. Scleral necrosis, stop steroids use only antibiotics ointment, NSAID

Suture removal / relaxation

- Indication for suture removal: 8-o sutures removed after 8 weeks; 10-o sutures removed if necessary.
- If loose suture is causing accumulation of mucus remove it and if wound integrity is not good consider for resuturing.
- If suture removal is done - topical broad-spectrum antibiotics - hourly for first day and 4 times a day for one week.

Special Instruction during Discharge

- No head bath for 3 weeks
- Normal diet from the day of operation (liquid diet 2 hours after operation)
- No river or pond bath (dip in) for 3 months
- After suture removal no pond or river bath for at least 1 week
- TV viewing & reading (within a week in Phaco & 15 days for others)
- Not to drive two wheelers up to one month
- Not to lift heavy weight for at least 2 months
- Dark glasses to be used for one month for outdoor activities till regular glasses are given.