Editorial

Repeat Enhanced Wake up Call Endophthalmitis

Post operative endophthalmitis is a grave complication with disastrous consequences **refer to a review article on this important topic by Khawaja Khalid Shoaib page 111 of present issue and an unusual case report of endogenous endophthalmitis by Mustafa Iqbal etc at page 116 also present issue of PJO by Prof. M Lateef Chaudhry Editor-in-Chief.**

Recently increasing incidence of endophthalmitis is being observed after cataract surgery.

Possible factors may be

- Inadequate sterilization due to frequent electricity breakdowns.
- Socio-economic factors compelling cutting corners in standard practices leading to reusing leftover fluids, viscoelastics, repeated usage of blades, knives, cannulas and perhaps lesser observance of Phaco hand pieces sterilization for each procedure.
- Hot weather
- Undue reliance on efficacy of antibiotic drops claimed by drug companies

I wish to remind all the colleagues regarding the standard surgical practices which have evolved over the time for safer cataract surgery in particular.

1. Preop thorough general examination of the patient, the surgical field, eye and its adnexa especially lacrimal passages and adoption of standard aseptic measures and precautions.
2. Preop use of antibiotic drops in both eyes for about a few days.
3. Pyodine iodine 10% solution for operative site preparation, particularly its application to lid margins and eye lashes.
4. Pour a few drops of 5% pyodine in conjunctival sac for 3 minutes before surgery and then wash out.
5. Management of incision in cases where it is not properly constructed particularly after using blunt knife, in young myopic and elastic corneo-scleral cases, wound burns, by applying a suture (sleep stitch) besides wound hydration etc.
6. Use intracameral or subconjunctival antibiotic or irrigate the conjunctival sac with antibiotic solution. I prefer subconjunctival to intracameral to avoid dosage calculation errors though it may be some what painful or cause unsightly subconjuntival hemorrhage at times.
7. After removal of speculum at the conclusion of surgery again instill a few drops of 5% pyodine in conjunctival sac.
8. Use opsite or some other drape to cover the lid margins and eyelashes during surgery.
9. Do not let a pool of fluid collect in the conjunctival sac in deep set eyes and in cases where conjunctival swelling occurs due to subconjunctival collection of irrigating solution.
10. Avoid performing hydration of wound in a pool of fluid in conjunctival sac.
11. Start post operative antibiotic and steroid drops around six hours after surgery.
12. Remove all the lenticular remanants in the capsular bag, and anterior chamber and angle recess etc.
13. Avoid posterior capsular tear and if it does happen then the anterior and posterior segments should be meticulously cleaned and managed.
14. Use injectors for inserting intraocular lens in foldables.
15. Take special cautions in temporal clear corneal incisions.

I also requested a very talented and experienced ophthalmologist **Professor Shahid Wahab** of Karachi

to give his valuable guidelines regarding early detection and timely management of endophthalmitis which are as follows.

Postcataract Surgery Endophthalmitis

Cataract Surgery is most frequently performed procedure. Endophthalmitis is the most serious complication of intra ocular surgery. Prevention of this is most important issue.

Predisposing factors are indiscriminate use of steroids. Poor hygiene, gaps in sterilization, diabetes, no stitch surgery & high reliability on antibiotics. There is a increased risk in summer months[1].

Management depends upon history & symptoms such as pain, decreased vision & redness. In 30% cases there is no pain. On examination, lid swelling, conjunctival congestion/ chemosis, corneal shine may become dull, hypopyon is present in most of the cases.

On diagnosis prompt action is mandatory. Anterior chamber and vitreous tap should be done in strict aseptic measure.

The European Society of Cataract & Refractive Surgery, Endophthalmitis study[2] clearly indicates that Intracameral antibiotic agents should play a role in endophthalmitis prophylaxis. Third generation cephalosporine is better than others. Cefuroxime injection lowers the chances of bacterial contamination by a factor of 5. This means that the risk rate is reduced to less than 5 in 10,000 cases.

In practical terms,[3] taking 750 mg of cefuroxime powder and diluting it by yourself to a concentration of 1 mg/0.1 ml exposes you to all of the risks of kitchen pharmacy, with errors in dilution, a possible induction of toxic anterior segment syndromes and the frightening possibility of contamination, for example with Pseudomonas, against which cefuroxime is not effective. ESCRS has recommended intra cameral antibiotics, they have proved it in an extensive study. American ophthalmologists do not agree with these findings.

Endophthalmitis is a horrifying thing to happen. In my opinion, there is always a lapse/gap in the care of the patient at any one stage. A big team is involved in the care of the patient.

To find a gap, we have to follow the patient from the first visit to the stage of Endophthalmitis. In history, we might have missed some thing like diabetes, decreased immunity, patient may be on steroids for long time. Once I encountered a patient who was using antibiotics for three months, status of lacrimal sac and ear infection is also important. The gaps can be the following;

- Poor hygiene
- Dilating drops bottle touching eye lashes of the patients in clinic (Cross infection)
- No preoperative prophylactic drops
- Instilling of drops in surgery
- Proper scrubbing of all staff
- Pre op: cleaning of surgical area and eye lashes
- Opsite use
- Povidone-iodine 5% wash
- Corneal Abrasion
- Gaps in surgical procedure
  a. Pooling of fluid in the medial canthus
  b. Bad practices by surgeon
  c. Posterior capsular rupture
  d. Long duration of surgery
- Lack of downward displacement of air removal from theatre (in some theatres there is a fan being used)
- Sterilization of instruments / methylcellulose reuse
- Phaco probe reuse
- Secure wound/suture less wound should not breath with blinking
- No Post op: Sub Conjunctival Injection
- No Post op Slit lamp examination to see any sign of infection
- Proper Follow up/medication
- Teaching patients how to instill drops
- Teaching patients how to clean the eye
- Load shedding / Summer / Sweating
- Education & counseling of patient for hygiene
- Cleaning hands before instilling drops / infection in tooth or ear infection
- Eye camps

Having Endophthalmitis is a bad experience for surgeon, patient and his family. Some surgeons have gone to the extreme and care swings to two extreme ends. One surgeon thought that it occurs because of tooth infection so he used to get all doubtful teeth removed before surgery. Some Surgeons think that prophylactic antibiotics pre- op & sub conjunctival is not necessary.

First it should not happen. If at all it happens there should be early diagnosis & management. After all,

the ultimate responsibility is of the surgeon who interfered with the quiet eye. Overall recovery depends on the virulence of the organism and keen interest & knowledge of surgeon.

Research is done to bring new medication & vitrectomy machines. I think research should be done to improve standards of work and find out the gaps in a procedure where so many people are involved.

We are talking now the evidence based ophthalmology. I think we are not collecting evidence properly. We must have registry where all endophthalmitis cases are reported. Few months back in one hospital, there were forty endophthalmitis cases in one day.

Prophylaxis only by antibiotics, pre, peri and post operative will not solve the problem, It may reduce the incidence. Cause of Endophthalmitis is a gap, in one step of the whole procedure. Giving antibiotics will not solve the problem. We have to standardize the procedure and make a strict checklist of each step like even up to the post operative patient's poor hygiene.

GUIDELINES FOR ACUTE POST OPERATIVE ENDOPHTHALMITIS

Background information:

Endophthalmitis is an inflammatory condition of the intraocular cavities (ie, the aqueous or vitreous humor) usually caused by infection. Noninfectious (sterile) endophthalmitis may result from various causes such as retained native lens material after an operation or from toxic agents.

The 2 types of endophthalmitis are endogenous (ie, metastatic) and exogenous. Endogenous endophthalmitis results from the hematogenous spread of organisms from a distant source of infection (eg, endocarditis). Exogenous endophthalmitis results from direct inoculation as a complication of ocular surgery, foreign bodies, and/or blunt or penetrating ocular trauma.

Most cases of exogenous endophthalmitis (about 60%) occur after intraocular surgery. When surgery is implicated in the cause, endophthalmitis usually begins within 1 week after surgery. In the United States, postcataract endophthalmitis is the most common form, with approximately 0.1-0.3% of operations having this complication, which has increased over the last 3 years.

MANAGEMENT OF ENDOPHTHALMITIS

Prompt clinical diagnosis:

History

Patients with acute postoperative endophthalmitis typically present within 6 weeks of intraocular surgery with moderate to severe eye pain and decreased vision.

Physical

- The hallmark findings on ophthalmic examination are posterior and anterior chamber inflammation.
- Hypopyon is present in most cases.
- Other important findings include conjunctival hyperemia and chemosis, corneal edema, wound abnormalities, eyelid or orbital inflammation.
- In rare circumstances, patients may develop chronic, infectious endophthalmitis months to years after intraocular surgery. These patients exhibit indolent inflammation, which is initially responsive to corticosteroids, but over time, become refractory to therapy. Although conjunctival hyperemia, corneal edema, and anterior and posterior chamber inflammation are often present, rapid deterioration of vision and hypopyon are not seen frequently.

Once the diagnosis has been made, or strongly considered, prompt action is needed. Final visual outcome is heavily dependent on timely recognition and treatment.

PERFORM AC AND VITREOUS TAP WITHIN ONE HOUR OF CLINICAL DIAGNOSIS

Perform Vitreous tap in Operation theatre under strict aseptic conditions using phaco/vitrector or portable vitrector.

Also perform AC tap for microbiology.
Microscopy and gram stain results are available after one hour, pathogen culture results after 24 hours and antibiotic sensitivity testing results after 24 to 48 hours using conventional methods.

INJECT EMPIRICAL CHOICE OF ANTIBIOTICS

Instill intravitreal antibiotics at the same time using separate syringes and 25 or 30 G needles for each drug either directly through pars plana or by injecting through the sclerotomy wound if present.

Vancomycin hydrochloride (Vancocin, Vancoled, Lyphocin)

Adult

Intravitreal: 1 mg in 0.1 mL
Subconjunctival injection: 25 mg

Pediatric
Not established

Ceftazidime (Ceptaz, Fortaz, Tazicef, Tazidime)
Third-generation cephalosporin with broad-spectrum, gram-negative activity; lower efficacy against gram-positive organisms; higher efficacy against resistant organisms. Arrests bacterial growth by binding to one or more penicillin-binding proteins.
Adult
Intravitreal: 2.25 mg in 0.1 mL
Subconjunctival: 100 mg

Pediatric
Not established
Dos and Don'ts of intravitreal antibiotics:

- Never return the diluted drug to the same or original vial for further dilution.
- Never dilute at greater than 1 in 10.
- Do not use syringes more than once.
- Do not reuse bottles.
- Avoid use of drugs with preservatives if possible.
- Do not point the needle towards the retina.
- Do inject the drugs slowly over 1 to 2 minutes

Intravitreal dexamethasone?
To minimize acute inflammation associated with the bacterial process there is a current view to inject unpreserved dexamethasone 0.4mg in 0.1ml intravitreally at the same time as the antibiotics.

How to prepare intra vitreal drugs?

Vancomycin (1mg/0.1ml). Reconstitute one vial of 250 mg and make up to 10 ml with sterile normal saline in a sterile bottle with lid. Mix well. Withdraw 2ml accurately and add to 3ml of sterile normal saline in a sterile bottle with lid. Mix well. Use 0.1ml.

Ceftazidime (2mg/0.1ml). Reconstitute one vial of 500mg and make upto 10ml with sterile normal saline in saline in a sterile bottle with lid. Mix well. Withdraw 2ml accurately and add to 3ml of sterile normal saline in a sterile bottle with lid. Mix well. Use 0.1ml.

When to repeat intravitreal antibiotics?

Intravitreal antibiotics can be repeated as necessary according to the clinical response at intervals of 48 to 72 hours.

SYSTEMIC ANTIBIOTICS

For acute virulent endophthalmitis begin adjunctive systemic therapy with the same antibiotics as those used intravitreally for 48 hours to maintain higher levels within the posterior segment of the eye.

ROLE OF SYSTEMIC CORTICOSTEROIDS

Oral administration of prednisolone (1mg/kg body weight) one day after intravitreal antibiotic therapy may be considered.

REFERRAL TO VITREORETINAL SURGEON

If possible do refer to a vitreoretinal surgeon for an opinion on a full vitrectomy.

Medical treatment has advantage of time over completeness. While it ignores fundamental surgical principles of ''where there is pus, let it out'' and provides a smaller sample, it permits earlier injection of intravitreal antibiotics and earlier microbiology. It also buys time pending the availability of a vitreoretinal surgeon and vitreoretinal operating room.

OBSERVE THE PATIENT

Keep the patient under strict supervision, which may even merit admission and observe for the signs of inflammation. However keep in mind that usually inflammation becomes worse before becoming better again.

References

1. **Rubio EF.** Climatic Influence on conjunctival bacteria of patients undergoing cataract surgery. Eye 2004; 18: 778-784
2. **Barry P, Seal DV, Gettinby G, et al.** ESCRS study of prophylaxis of post operative Endophthalmitis after cataract surgery: Preliminary report of principal resultfrom a European Multicenter study; the ESCRS Endophthalmitis study group. J Cataract refract Surg 2006; 32:407-410
3. **Barry P.** September 12, 2006 ESCRS Endophthalmitis Study confirms cefuroxime's role in reducing infection risk http://www.osnsupersite.com/view.aspx?rid=18342

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