Protocol To Prevent Post-Operative Endophthalmitis

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Endophthalmitis is an inflammation of the internal layers of the eye resulting from intraocular colonization of infectious agents and manifesting with an exudation into vitreous cavity. Most cases of exogenous endophthalmitis (49% to 76% as reported by various studies)occur after intra ocular surgery. When surgery is implicated as the cause , endophthalmitis usually begins with in 1 week after surgery. post cataract endophthalmitis is the most common form, with approximately 0.1-0.3% of operations having this complication. Its prevalence is high due to increase no of cataract surgery being done.

Post operative infections in ophthalmology are best prevented than treated. However even one case of post operative uveitis can give the surgeon many sleepless nights. But aggressive management strategies and strict and hygienic operating protocols have succeeded in controlling post operative uveitis to a large extent. In the event of an unexpected mishap, in addition to proper management of the case an in-depth analysis of the operating facility and its protocols are essential to ward off any embarrassments in future.

Management of post-operative uveitis has come a long way since the landmark studies conducted on this. The risk factors are different for isolated and cluster endophthalmitis. Any isolated case of post-operative endophthalmitis is usually endogenous, but more than two cases form a cluster and warrants thorough evaluation.

Isolated case of endophthalmitis

Patients own bacterial flora may gain entry at the time of surgery and thus increasing the development of postoperative endophthalmitis.

It is very important to rule out diseases like chronic blepharitis, conjunctivitis, canaliculitis and keratoconjuntivitis sicca, chronic dacryocystitis before planning ocular surgery for the patient. Blepharitis should be treated with antibiotic ointments and lid scrubs at least 2 weeks before the procedure. The role of cutting of eye lashes and routine culture and sensitivity before intraocular surgery is still controversial. Sterile tapes can be affixed to separate the lashes from the operating field. In case of chronic dacryocystitis ,a definitive surgery should be undertaken for the sac before the intraocular procedure.

Diabetes control should be adequate and it is better to get a physician's concurrence before operating on a labile diabetic. Glycosylated Haemoglobin (HbA1C) can be used as a good marker for long term control of diabetis. Slight increase in blood sugar level on the day of surgery can be ignored in cases of normal HbA1C.

The other important intraoperative risk factors for isolated postoperative endophthalmitis are inadequate eyelid or conjunctival disinfection, prolonged surgery, vitreous loss, prolene haptics of IOLs. The above factors can be taken care of by the use of pre-operative topical antibiotics for 24 hours, facial scrub, povidone iodine into the conjunctival sac, adhesive plastic drapes to separate eyelashes, surgeon gloves, subconjunctival antibiotics at the end of the surgery. The role of antibiotics in the irrigating solutions is still questionable..some surgeon used vancomycin in BSS drip. However the ESCRS study have shown that intracameral injection of 1.0mg of cefuroxime in 0.1ml saline at the end of surgery have markedly reduced the incidence of post operative endophthalmitis. There are reports of intra cameral Moxifloxacin injections at the end of surgery (5). But resistance to Moxifloxacin have also been reported.(7,8). The only reliable form of antimicrobial prophylaxis is the use of 5% Povidone Iodine drops before surgery and giving a contact time of at least 3 minutes.(3) It is prudent to start a systemic antibiotic like Ciprofloxacin 500mg bid if there were lot of intraoperative manipulations and in case of very long surgeries.

Cluster endophthalmitis

External factors are the major risk factors in the causation of cluster postoperative endophthalmitis. There have been various reports from all over the world describing bacterial as well as fungal postoperative cluster endophthalmitis. Defects in sterlisation of instruments,

contamination of tap water, multiple dose fluids and drugs have been held responsible for bacterial cluster postoperative endophthalmitis. Fungal cluster postoperative endophthalmitis has been reported after contaminated irrigating solutions, IOLs, viscoelastics, improper ventilation system, poor OT hygiene .

Ventillation

Proper disinfection can prevent postoperative endophthalmitis. Air can get uniformly contaminated especially in case of turbulent ventilation. Hence maintenance of air quality is of utmost importance in an OT. Air circulaton with a laminar air flow system through High efficency particulate air filter(HEPA)(0.3?m) serves the best purpose.

But By strictly adhering to standard disinfection protocols one can keep the conventional OT as safe and effective as an ultra clean facility. Special care should be given to the filters in window and split ACs.

All horizontal surfaces in the OT (eg. Furniture,surgical lights and equipment) should be damp-dusted with an Environment Protection Agency(EPA) registered disinfectant like Lysol cleaner and cloroxdisinfecting spray at the end of day.(4)

Periodic open plate cultures should be taken to evaluate the air quality. 10cm diameter blood agar plate is kept open at the head end of the operating table for 30 minutes with the AC switched on. This should be done before disinfection and after giving adequate contact time post disinfection. A colony count of less than 10 is acceptable provided there are no colonies of Gram negative bacilli and fungi.

Humidity

The optimum relative humidity is 50 to 55% and temperature 20C to 220C.Care should be taken to prevent any source of humidity eg: plumbing lines over the ceiling, toilets above the OT. Also antifungal paints are available which can give protection from humidity.

Personnel

Desquamated plaques act as nidus for microbial growth. While inside the OT, all staff should strictly adhere to the proper OT etiquette even when operations are not taking place. The number of people inside the OT should be limited to 5 per 180 sq.ft (AIOS guidelines). Not only the surgeon and the scrub nurse, all staff including the cleaning staff should be free from all infective foci. It is ideal to check the throat swab of every OT personnel at induction and when needed. Similar sets of gown should be prepared for the patient as for the doctor, patients hygiene must also be given due importance.

Instruments

All instruments especially intraocular instruments should be sterilized and not disinfected.. Moist heat (autoclave)(15 minutes at 121 oc , 10minutes at 126 0c, 3mins at 134 oc) and Ethylene oxide (ETO) are the most common sterilizing methods available.

All instruments should be cleaned thoroughly immediately after use and not at the end of the operating session. This helps to prevent formation of biofilms on the surface. Special care should be taken in case of hinged and serrated instruments like scissors and forceps. For each surgery separate sets of instruments should be autoclaved. Prior to OT for every surgery there should be separate autoclaved instrument. Disposable items used once should be segregated from OT. All reusable cannulae used to inject and remove ophthalmic viscoelastic devices (OVD) should be cleaned immediately after use to ensure proper cleaning. Ultrasonic cleaner and enzymatic cleaning solutions can help in dislodging the dirt from surfaces. At the end of the cleaning cannulae should beflushed repeatedly with distilled water and air. Instruments made of different materials like stainless steel, titanium and chromium plated instruments should not be processed in the same container. Otherwise ionisation of the material can happen which can reduce the life of the instruments.

Endophthalmitis have been reported from contaminated internal tubings in earlier phaco machines. All phaco accessories should be steam sterilized before every case. Flash autoclave(132 0c at 30lbs of pressure for 3minutes.) comes in handy to sterilize them between cases. The phaco tip, sleeve and chamber should be changed for every case.

Consumables and linen

Irrigating fluids, OVDs and intracameral (I/C) drugs have been implicated in many cases of TASS and endophthalmitis.

Every bottle of irrigating fluid should be subjected to careful screening to rule out suspended particles in it. Inspecting it in a beam of light (Tyndall effect) will reveal suspended particles. pH of the fluids can be checked by the litmus paper. Care should be taken to see that the sealed pouches containing the OVDs and trypan blue are free of contaminants. Linen is the most common source of lint in the operating field. Packing of linen and gloves should not be done in the operating room. Lint-free materials can be used for draping. The linen should be dry after the autoclave procedure.

Water

The water quality is of supreme importance in the OT. Running water should be used for all scrubbing and cleaning purposes. Final wash can be done using filtered water. Periodic culture of water should be done.

Disinfection and Sterilising protocol

In each hospital ,an interdiscipilinary team should meet periodically to discuss the process of cleaning the operating rooms and implement certain own disinfection protocols such as all instruments except heat sensitive one should be steam sterilisied. Heat sensitive instruments are sterilisird by ETO. Instruments should never be subjected to chemical sterilization. Formaldehyde fumigation is commonly used in OT , for 1000 cubic feet area 500ml of 40% formalhyde in one liter of water at weekly intervals. Gowns are considered sterile only in front, from chest to waist and from the hands to slightly above elbow, non sterile items should not cross above a sterile field. A safe space or margin of safety is maintained between sterile and non sterile objects and areas.

Documentation of the daily and weekly disinfection procedures and culture reports are absolutely essential. In the event of a legal suit these may serve as an excellent defence.

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The moment I have realized God sitting in the temple of every human body,
the moment I stand in reverence before every human being and see God in him
– that moment I am free from bondage, everything that binds vanishes, and I am free.

- Vivekananda