Practice Management

How to Analyze
The Operative Set up in case of Presumed Post operative Endophthalmitis

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Post operative infections in ophthalmology are best prevented than treated. Many of us are forced to conduct operations in less than ideal situations. But aggressive management strategies and strict and hygienic operating protocols have succeeded in controlling post operative uveitis to a large extent. However even one case of post operative uveitis can give the surgeon many sleepless nights. 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 this1 However a detailed discussion on the management of post operative endophthalmitis is outside the purview of this article. 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

The patient is the most common source of an isolated endophthalmitis when multiple surgeries done on the same day went uneventful. The pre-operative investigations should exclude any foci of infections in 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. (Figure1)

Patency of the nasolacrimal duct (NLD) should be ensured by a ROPLAS (Regurgitation On Pressure over Lacrimal Sac) Routine syringing of the NLD is not necessary2. In case of chronic dacryocystitis a definitive surgery should be undertaken 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 diabetes. Slight increase in blood sugar level on the day of surgery can be ignored in cases of normal Hba1C. 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. Role of antibiotics in the infusions and sub conjunctival antibiotics is debatable. However the ESCRs study have shown that intra cameral intracameral injection of 1.0mg of cefuroxime in 0.1ml saline at the end of surgery have markedly reduced the incidence of post operative endophthalmitis1. There are reports of intra cameral Moxifloxacin injections at the end of surgery5. But resistance to Moxifloxacin have also been reported7,8 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.3,6

Cluster endophthalmitis

These can be traced to various sources
- Ventilation
- Humidity
- Personnel
- Instruments
- Consumables
- Water

Ventilation4

It is the most common source of contamination in an OT. It is a common practice to take cultures from various objects like OT table, chair, walls, ceiling etc. A positive culture from these surfaces only shows the inadequacy of cleaning and will not be a direct cause of infection in most cases as there has to be a medium to transfer the organism from the surfaces to the operating site. But air can get uniformly contaminated especially in case of turbulent ventilation. Hence maintenance of air quality is of utmost importance in an OT. An ultra clean OT will have a centralized air conditioning with terminal HEPA filter and laminar air flow, maintaining adequate air exchange and a positive pressure with controlled humidity and temperature. However this is not mandatory in a usual ophthalmic OT. 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. One has to be more vigilant if the outside air quality is poor. Any furniture that is not absolutely necessary in the OT must be removed from there. Horizontal surfaces should be minimized in the operating room as they can accumulate dust.

Periodic open plate cutures 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.

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Humidity

The optimum relative humidity is 50 to 55% and temperature 20 to 22°C. False ceiling if any, should not be made of materials which absorb and retain water like gypsum. Care should be taken not to have plumbing lines over the ceiling. There are instances where toilets above the OT can leak and stain the ceiling and walls. Antifungal paints are available which can give protection from humidity. Another cause of increased humidity is the water used in fogging machines. Wiping the surfaces with a suitable disinfectant of adequate concentration is enough to disinfect the OT. If one is particular in using the fogger the disinfectant should be diluted in minimum amount of water (10 ml of disinfectant in 500 ml of water to get 2% solution) and used for 5 minutes only.

Personnel

Desquamated plaques act as nidus for microbial growth. An individual can shed up to 10^6 particles every day. It is ideal to check the throat swab of every OT personnel at induction and when needed. Not only the surgeon and the scrub nurse, all staff including the cleaning staff should be free from all infective foci. 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).

Instruments

All instruments especially intraocular instruments should be sterilized and not disinfected. Chemical sterilization using acetone, formalin or glutaraldehyde (Cidex) is not at all recommended in ophthalmic OT. Moist heat (autoclave) 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. 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 be flushed 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 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. (Figure 2) 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. (Figure 3)

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

Every hospital should make their own disinfection protocol. All instruments except heat sensitive ones should be steam sterilized. Heat sensitive instruments are best sterilized by ETO. Instruments should never be subjected to chemical sterilization. Low and intermediate level disinfectants like quaternary ammonium compounds and phenol should not be used in critical areas in the OT. Formalin has been banned the world over due to its toxicity and carcinogenicity but is still used in many hospitals. Validation and documentation of every autoclave cycle should be done using class 6 chemical indicators (Figure 4). 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.
References


9. S. Sasikumar, P.I.Mohan (Eds)Operation Theater and Asepsis: CME series1: Cochin Ophthalmic Club
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