ROLE OF EARLY VITRECTOMY IN THE TREATMENT OF FUNGAL ENDOPHTHALMITIS

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Fungal endophthalmitis is relatively uncommon but is potentially devastating to the eye, both visually and structurally. The unique treatment challenges owe to its diagnostic difficulty and limited therapeutic options. An immediate vitrectomy is often advocated because fungal infections are known to run a fulminant course. However the timing of surgery is still unclear due to the lack of Level I evidence from RCTs. Behera et al retrospectively analysed their 10-year experience (2006 – 2015) in managing fungal endophthalmitis.

The authors identified patients from their clinical and microbiological records of fungus culture-positive cases at LV Prasad Eye Institute and recorded the patient's demographics, predisposing factors, clinical presentation, management and treatment outcomes. In order to compare outcomes, the patients were divided into 2 groups based on the timing of vitrectomy – 'immediate' or 'deferred'. Group 1 had an 'immediate' vitrectomy defined as one performed at the time of initial vitreous biopsy and intravitreal antibiotics. Group 2 had a 'deferred' vitrectomy defined as one done after obtaining the microbiology report or in the eyes that received only a diagnostic vitrectomy (undiluted vitreous collected for microbiological study using a vitreous cutter). Based on the primary intravitreal antibiotic they were divided into subgroups—AF (antibacterial and antifungal antibiotics) and A (antibacterial antibiotics only).

Each clinically suspected endophthalmitis case based on the history was categorized into one of the three endophthalmitis types—postoperative, traumatic, or endogenous. The decision for vitrectomy in endophthalmitis was based on the presenting vision, B-scan documentation of vitreous opacities or membranes, and corneal clarity sufficient for intraocular surgery. The cases with poor corneal clarity or with milder grades of vitritis received only vitreous biopsy and injection of antibacterial antibiotics without any additional vitrectomy (Group 2A). Also, if meticulous clearing of anterior segment exudates through a limbal paracentesis did not improve posterior segment visualization, the surgery was limited to vitreous biopsy and injection of antibiotics only (Group 2A). The smear for fungus detection was done with a wet mount of 1% calcofluor white and was examined under a fluorescent microscope. The specimen was incubated for at least 2 weeks before reporting it negative.

During the 10-year study, 970 subjects treated for diagnosis of clinical endophthalmitis were culture positive. And 7.1% (n = 69) of them were fungus positive. Three patients were excluded because of either insufficient follow-up (n = 2) or inadequate records (n = 1), and the remaining 66 patients met the inclusion criteria. There were 31 and 35 subjects in Groups 1 and 2, respectively, based on whether they received an immediate or deferred vitrectomy. The incidence of diabetes in Group 1 was higher and likewise was the associated systemic illness at presentation.

The ocular symptoms and signs in Groups 1 and 2, respectively, were as follows: pain (54.83 and 60%), lid edema (48.38 and 48.57%), conjunctival congestion (87.09 and 94.28%), and corneal involvement (87.09 and 80%); these were comparable. All the subjects in Group 1 received immediate (and to a possible extent complete) vitrectomy at presentation, and only 5 (14.28%) patients in Group 2 received vitrectomy, with a mean delay of 18.8 ± 10.57 days (range 7–30 days) from presentation.

The mean best-corrected logMAR vision was 2.534 (Snellen equivalent range 20/125 to no light perception) in Group 1 patients and 2.336 (Snellen equivalent range 20/25 to no perception of light) in

Group 2 patients at presentation and were comparable (P = 0.189, unpaired t-test). The mean best-corrected logMAR vision at last visit was 2.153 (Snellen equivalent range 20/30 to no perception of light) in Group 1 and 2.367 (Snellen equivalent range 20/20 to no perception of light) in Group 2. Immediate vitrectomy showed significant improvement in final vision (P = 0.027, paired t-test), but it was not superior (P = 0.322, unpaired t-test) to the final visual outcome of patients who received deferred vitrectomy. In Group 2, neither the patients who received vitrectomy in the course of the management nor the ones who received intravitreal antifungal antibiotic injections alone (P = 0.9175 and P = 0.811, respectively, paired t-test) showed any significant visual improvement.

Subgroup analysis of the groups of patients who had a clinical suspicion of fungal etiology at presentation showed that the patients who received antifungal antibiotics along with immediate vitrectomy (Group 1AF, n = 6; logMAR 1.77) had a significantly better mean visual acuity (P = 0.013, unpaired t-test) than the patients who received intravitreal antifungals alone without vitrectomy as the first-line intervention (Group 2AF, n = 8; logMAR 2.72 Snellen equivalent 20/11,016).

Aspergillus species was the most common isolated fungus in this series. The distribution was comparable in both groups. A positive history of trauma with vegetable matter was present in 85.7% (n = 18) subjects of traumatic endophthalmitis. Likewise, 60% (n = 6) of endogenous endophthalmitis had a history of febrile illness for which hospitalization was required before the onset of ocular symptoms.

Despite the availability of safer and better antifungal agents and improvements in vitrectomy procedures, the standard of care for fungal endophthalmitis is still not clear, although a combination of vitrectomy and antifungal agents seems to be the most appropriate therapy. Although this combination possibly results in better visual and anatomical outcomes, the timing and necessity of adjuvant intravitreal antifungals at the time of vitrectomy have not been studied well. Invariably, the institution of antifungal treatment is delayed until the microbiological reports are available because it is difficult to clinically distinguish fungal from bacterial endophthalmitis.

Subgroup analysis in this study also validated the above findings. When vitrectomy was deferred (in Group 2), neither the patients who received late vitrectomy nor the ones who received multiple intravitreal antifungal antibiotic injections alone (P = 0.9175 and P = 0.811, respectively, paired t-test) showed any significant visual improvement. Early institution of antifungal therapy reduced the risk of poor structural outcome and improved vision significantly only when immediate vitrectomy was done concurrently. But as the sample size for such a comparison was small in these subgroups, the conclusions drawn may not be universally applied.

In general, the endophthalmitis vitrectomy guidelines are followed in all postoperative endophthalmitis, and immediate vitrectomy is done in endogenous and traumatic endophthalmitis. In summary, it was suggested that all patients with any suspicion of fungal etiology are treated with an early vitrectomy and intravitreal antifungal antibiotic injection; in regions where incidence of fungal endophthalmitis is high, intravitreal antifungals may be added to the empirical antibiotics when differentiation of fungal from bacterial endophthalmitis is difficult.