Pinpoint size port d’Entrée as a predictor for better clinical outcome in pediatric endophthalmitis: A case series

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ABSTRACT
Endophthalmitis is an intraocular inflammation involving both posterior and anterior segments, caused by bacterial or fungal infections. Here, we present a case series of five cases presented to the National Referral Hospital from January to December 2017. Five eyes were identified, including exogenous and endogenous odontogenic causes. All eyes were managed with vitrectomy, intravitreal antibiotics, and systemic antibiotics. Documented final best VA were 20/40 (20%), 1/300 (40%), and no light perception with phthisis bulbi (40%). Despite aggressive timely treatments, visual prognosis are poor in both endogenous and exogenous endophthalmitis. The best final VA 6/12 was found in the smallest port d’entrée size (pinpoint). Other characteristics did not show any significant clinical difference. Pinpoint size or smaller port d’entrée suggests better visual outcomes in pediatric endophthalmitis.

Key words: Intravitreal antibiotics, Pediatric endophthalmitis, Visual prognosis, Vitrectomy

Published literature on pediatric endophthalmitis in Indonesia is still scarce. This case series conducted in a National Referral Hospital (RSCM) in Jakarta, Indonesia, was intended to elucidate this topic.

CASE SERIES
A case series was conducted using medical and microbiological records of all pediatric endophthalmitis patients treated in RSCM, Jakarta, Indonesia, from January 1, 2017, to December 1, 2017. A total of five pediatric patients were documented; four of exogenous causes (80%) and one of endogenous cause (20%). All exogenous endophthalmitis were preceded by solid trauma: Wire, scissors, metal ruler, and palm leaf rib.

Case 1
A 7-year-old boy was struck by a wire in his left eye while playing with his friends. He was admitted to the hospital with complaints of corneal rupture and endophthalmitis. The patient presents with VA light perception with disturbed projection (LPDP). He underwent corneal rupture repair and pars plana vitrectomy (PPV). The patient was also given antibiotics through intravitreal and intravenous route; thus has a final AV no light perception (NLP) on a 6-month follow-up.

Case 2
A 5-year-old girl presented with corneal rupture after accidentally stabbed her own right eye with a scissor. She...
was admitted to the hospital with modal AV of LPDP. After undergoing corneal rupture repair, PPV, and antibiotics administration via intravitreal and intravenous injection, her 6-month monitoring AV was 1/300.

Case 3
An 11-year-old boy had punctured his left eye with a metal ruler while studying in school. He was presented with a hypopyon and AV of 1/300 DP. He underwent corneal rupture repair surgery, PPV, intravitreal, as well as, intravenous antibiotics. However, his final AV at 6-month did not show any difference.

Case 4
An 8-year-old girl had a palm leaf rib pointed to his left eye and presented with AV 1/300 WP. She underwent PPV and antibiotics injections through the intravitreal and intravenous routes. At the 6-month follow-up, her final AV improved to 20/40.

Case 5
A 14-year-old boy was admitted to the emergency department with complaints of blurred vision with previous dental infection. His presenting AV was LPWP. After undergoing PPV, intravitreal, and intravenous antibiotics, his final AV at a 6-month follow-up was NLP.

Of all the patients, specimen cultures were extracted from vitreous humor (exogenous) and corneal scrap (endogenous). The microorganisms found in cultures were *Staphylococcus epidermidis* (coagulase-negative *Staphylococcus*) (40%), *Klebsiella pneumonia* (20%), and *Acinetobacter lwoffii* (20%).

Mechanical trauma of exogeneous endophthalmitis was classified based on the Birmingham Eye Trauma Terminology [7] as penetrating trauma. Further classification based on Ocular Trauma Classification Group [8,9], included presenting VA, RAPD status, and involved zone. Some RAPD status could not be assessed due to hypopyon. The involved zone was classified into the zone I (the whole cornea including corneoscleral limbus), II (corneoscleral limbus to a point 5 mm posterior into the sclera), and III (posterior to the anterior 5 mm of the sclera) [8,9]. Onset to hospital admission and procedures varied between the patients. All patients underwent PPV and received both intravitreal also systemic antibiotics. Among all patients, only one patient (20%) had a VA of 20/40, while other patients had a VA of 1/300 or worse. Details of the cases are summarized in Table 1.

DISCUSSION

Endogenous endophthalmitis is responsible for 2–8% of endophthalmitis incidence [10]. In Thordsen et al. [6], pediatric endogenous endophthalmitis accounted for 12.5% in two distinct patients; both were immunocompromised (leukemia and infant with Candida sepsis) [6]. Immunocompromised patients are prone to higher risks, emphasized with predisposing conditions such as diabetes mellitus (33%), intravenous drug use (5%), HIV infection (3%), malignancy (3%), autoimmune disease (3%), and others [2].

Sources of endogenous infection should be identified and treated promptly. Some of the most prevalent included liver abscess (19%), lung infections (8%), endocarditis (8%), soft tissue infection (7%), urinary tract infection (6%), meningitis (6%), and others. "Klebsiella" infections in liver abscesses, accounted for 60% of endogenous endophthalmitis throughout Asia [4]. In our series, one endogenous endophthalmitis was presented with an odontogenic source. The patient came with poor oral hygiene including multiple caries. He experienced gradual blindness 1 week before hospital admission. The delayed presentation might play a role in the NLP final VA outcome in this patient. Approximately 90% of endophthalmitis cases were of exogenous cause [3]. A 10-year collected data from 1995 to 2005 [6] revealed that 87.5% of pediatric endophthalmitis were exogenous, with ocular trauma (44%) and previous ocular surgery (38%) as the most common etiologies. Our series found similar results with 80% of the cases being of exogenous cause.

Both endogenous and exogenous endophthalmitis are medical emergencies. Available managements for endophthalmitis are intravitreal antibiotics (IVTab), intravitreal corticosteroids, and vitrectomy [2-6,11]. Although received timely aggressive treatments, the clinical outcome for endophthalmitis patients remained poor [2,4]. Weng et al. [4] reported the mortality rate of endophthalmitis inpatients was 0.97%. A systematic review that included 342 endogenous endophthalmitis [2] showed that 41% achieved final VA 20/200 or better, 35% had it worse than 20/200, and 19% required evisceration or enucleation. Clavell et al. [12] reported that none of the patients had a final useful visual function. Around 57.1% of patients who received vitrectomy and IVTab had a visual outcome of NLP, 14.3% of patients needed to undergo enucleation, and the rest treated with IVTab or systemic antibiotic had a final VA of 20/200 (14.3%), 20/400 (14.3%), and 20/240 (14.3%) [12]. In our series, all patients underwent PPV, IVTab, and systemic antibiotics with varied final VA. Almost all patients had a final VA of 1/300 or worse, yet we found one patient with a final VA of 20/40. These findings were in concordance with Sridhar et al. [13] who reported that there was no statistically significant correlation between the underlying etiology nor the timing of surgery and the VA outcome. All patients underwent vitrectomy and received intravitreal antibiotics, with 95.7% of patients had a final VA of counting fingers (20/1500) or worse.

The visual outcome of endophthalmitis was correlated with the causative microorganism. A review by Durand et al. [11] stated that the chance of visual recovery was poor with Streptococcus species. Best visual outcomes occurred in either culture-negative specimens or caused by coagulase-negative *Staphylococci* [11]. Kuriyan et al. [14] found that the most common organisms of endophthalmitis were Streptococcus species (27.1%) and coagulase-negative *Staphylococcus* (20%), with 97% of cases were exogenous. Almost all patients received IVTab and underwent vitrectomy with 75% had a final VA of <20/400, while the other 25% underwent either evisceration or enucleation [14].
Sridhar et al. [13] found Streptococcus (19%), Coagulase-negative Staphylococcus (14%), and MRSA (Methicillin-resistant Staphylococcus aureus) (4%) as the most common causative agents. In our study, the microbe found in one patient with the best final VA (20/40) was S. epidermidis (coagulase-negative Staphylococcus). Another patient who also had S. epidermidis in his specimen had a final VA 1/300 and was presented with the largest size of port d’entrée of 5.5 mm (causative agent: metal ruler) and the latest hospital admission (4 days).

Studies reporting the size of port d’entrée for endophthalmitis were very limited, most of which evaluated gauge port’s size during vitrectomy. Park et al. [15] reported that gauge port sizes were unrelated to endophthalmitis prognosis. In our study, one patient with the best final VA of 20/40 was found with the smallest port d’entrée (pinpoint) from a penetrating trauma of the palm leaf rib and was admitted to the hospital 1 day after the onset. Cultures showed S. epidermidis (coagulase-negative Staphylococcus), which had been found for having the best visual outcomes in endophthalmitis beside culture-negative. There was one patient with shorter onset to hospital admission (11 h) yet had a final VA of 1/300, and presented with a larger port d’entrée of 4.3 mm from direct penetration of wire. Cultures showed K. pneumoniae, known as the most prevalent microorganism in endogenous endophthalmitis with poor visual outcome [4].

CONCLUSION

Despite aggressive timely treatments, visual prognosis is poor in both endogenous and exogenous endophthalmitis. The best final VA 6/12 was found in the smallest port d’entrée size (pinpoint). Other characteristics did not show any significant clinical difference. Pinpoint size or smaller port d’entrée suggests better visual outcomes in pediatric endophthalmitis.

REFERENCES


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