Traumatic endophthalmitis presenting as isolated retinal vasculitis and white-centered hemorrhages: Case report and review of literature

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The article reports a case and review of the literature of endophthalmitis presenting as isolated retinal vasculitis. A 26-year-old male was observed to have white-centered retinal hemorrhages and retinal vasculitis following an occult scleral perforation. At presentation, the visual acuity was 20/60. With clinical suspicion of early endophthalmitis, he underwent wound exploration, scleral tear repair, vitreous biopsy and administration of intravitreal antibiotics. Microbiology evaluation revealed significant presence of methicillin-resistant coagulase-negative *Staphylococcus epidermidis*. Final visual acuity improved to 20/20 at 6 weeks postoperatively. Literature search revealed eight similar cases, all of them due to *Staphylococcus* species. Retinal vasculitis and white-centered retinal hemorrhages can be a presenting sign of early endophthalmitis, especially with non-fulminant pathogens like *S. epidermidis*.

Key words: Endophthalmitis, retinal vasculitis, *Staphylococcus epidermidis*, white-centered retinal hemorrhages

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Endophthalmitis is defined as a serious intraocular inflammatory disorder affecting the vitreous cavity, which can result from exogenous or endogenous spread of infecting organisms into the eye.[1] It can be a devastating condition leading to permanent visual loss even with prompt and appropriate therapy. In most cases, the presentation of endophthalmitis consists of reduced or blurred vision, red eye, pain, lid swelling, hypoyon, and progressive vitritis. Progression of the disease may lead to panophthalmitis, corneal infiltration, and perforation, affection of orbital structures, and eventually phthisis bulbi.[2] Isolated retinal periphlebitis/vasculitis and retinal hemorrhages are mentioned as an indicator of early endophthalmitis.[3] Detailed information on such cases has not been reviewed in the past.

We report a case of acute post-traumatic endophthalmitis where methicillin-resistant *Staphylococcus epidermidis* was isolated. The case was diagnosed in the early stages as endophthalmitis, based on the presence of isolated retinal vasculitis and white-centered hemorrhages. We did a Medline search for any similar cases reported in literature.

Case Report

A 26-year-old male presented with painless decrease of vision in the right eye following trauma with an iron particle 4 days prior to presentation. On examination, the visual acuity in the right eye was 20/60, intraocular pressure (IOP) was 12mmHg and there was localized conjunctival congestion superonasally [Fig. 1]. Anterior segment was unremarkable, while on fundus evaluation there was clear media with normal disc, few internal limiting membrane striae in the macular area, areas of retinal vasculitis associated with isolated "white-centered" retinal hemorrhages, and perivascular white-colored retinal exudates localized inferiorly [Fig. 1]. The protruding vitreous knuckle present beneath the insertion of the medial rectus muscle at its superior margin was cut with vitrector and the 2-mm-long scleral tear was sutured with 7-0-vicryl. After taking an undiluted vitreous biopsy with a 23-gauge vitrectomy cutter, intravitreal antibiotics, vancomycin 1 mg and ceftazidime 2.25 mg in 0.1 ml each was given. Based on the microbiological culture, biochemical tests and mini API ID 32 Staph strip, *S. epidermidis* was isolated. Antibiotic susceptibility testing of the isolate was done by the Kirby-Bauer disk diffusion method as per Clinical and Laboratory Standards Institute guidelines (CLSI, 2009).[4] The organism was found to be resistant to ciprofloxacin, ofloxacin, cefuroxime, oxacillin and cefoxitin (methicillin), and sensitive to amikacin, cefazoline, gentamicin, vancomicin, gatifloxacin, moxifloxacin and chloramphenicol. Postoperative treatment with tablet gatifloxacin (400 mg stat followed by 200 mg twice daily for 7 days), eye drop gatifloxacin 0.3% (12 times per day) and eye drop prednisolone acetate 1% (2 hourly initially, followed by tapering doses) resolved the infection. Final uncorrected visual acuity was 20/20 at 6 weeks

postoperatively with resolution of all retinal signs [Fig. 2].

Discussion

Various authors[3,5-7] have documented the appearance of hemorrhages and vasculitis as an early feature of bacterial endophthalmitis. A case of fungal endophthalmitis[7] with

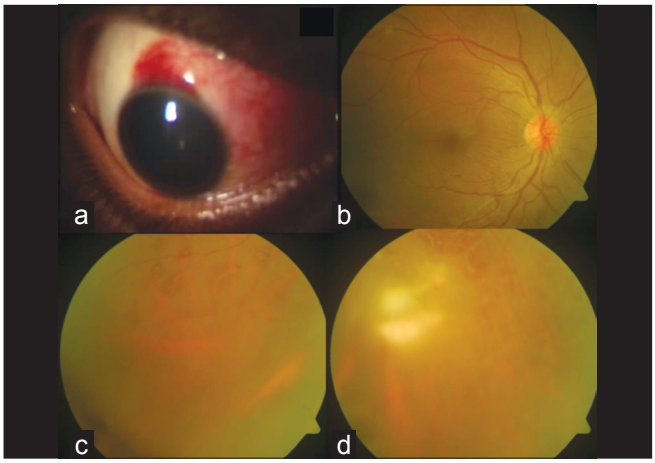

Figure 1: Clinical signs at presentation. (a) Area of occult scleral injury marked by localized congestion and chemosis; (b) fundus photograph showing macular internal limiting membrane striae; (c) white-centered retinal hemorrhages; (d) midperipheral and peripheral retinal vasculitis

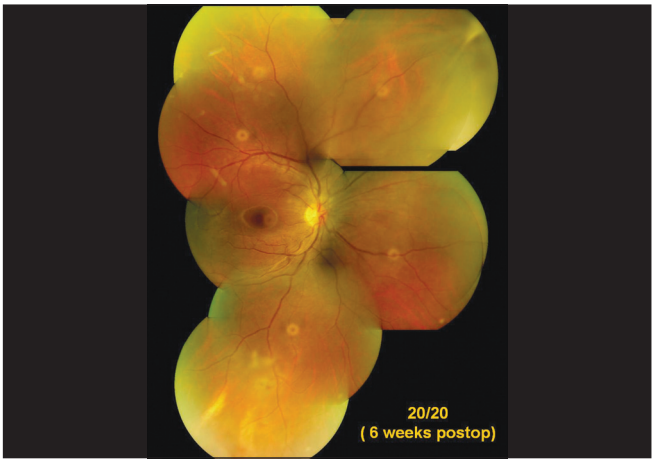

Figure 2: Postoperative fundus photograph showing resolution of retinal signs. Note the area of vitreous incarceration at the site of injury superonasally. Photographic artifacts (yellow circular) are seen

Table 1: Literature review of endophthalmitis presenting as retinal vasculitis and white-centered retinal hemorrhages

Published data (number of eyes)	Etiology and duration between sign and event	Causative organism	Intravitreal agents	Other treatments	Anterior chamber reaction	Visual acuity Initial	Visual acuity Final
Packer *et al.*[5] (3)	Postoperative vitrectomy and 1 day	*Staphylococcus*	Gentamycin, cefazoline, methicillin	IV and SC antibiotics; lensectomy Vitrectomy	2+ cells	20/80	20/50 at 10 weeks
	Postoperative cataract with PK and 1 day	*Staphylococcus epidermidis*	Gentamycin	IV antibiotics + oral steroids	Hypopyon	Not known	20/25 at 12 weeks
	Post-traumatic and 1 day	*Staphylococcus epidermidis*	Gentamycin, cefazolin	Vitrectomy IV and SC antibiotics oral steroids	None	20/25	20/20 (Many weeks)
Godley *et al.*[6] (2)	Postoperative cataract and 3 days	*Staphylococcus auricularis*	Vancomycin, gentamycin	IV gentamycin Ceftriaxone; SC vancomycin Gentamycin	Minimal	20/100	20/25 at 12 weeks
	Postoperative cataract and 3 days	*Staphylococcus epidermidis*	Vancomycin, gentamycin	Vitrectomy; removal of dislocated IOL	None	20/60	20/30 at 6 weeks
Choudhury *et al.*[7] (1)	Endogenous and 1 day	*Fungal*	Nil	Oral itraconazole 400 mg × 8 weeks; 200 mg × 4 weeks	Mild	20/100	20/20 at 12 weeks
Jeng *et al.*[3] (1)	Postoperative cataract and 1 day	*Staphylococcus* (methicillin resistant)	Vancomycin Amikacin, dexamethasone	Vitrectomy, IV and SC vancomycin amikacin; SC dexamethasone	Mild	CF 3 m	20/25 at 8 weeks
Subbiah *et al.*[9] (1)	Postoperative cataract and 1 day	*Staphylococcus epidermidis*	Vancomycin, amikacin	SC and oral steroids	Mild	20/40	20/30 (at the time of discharge)
Relhan *et al.* (current) (1)	Post-traumatic 1 day	*Staphylococcus epidermidis*	Vancomycin, cefazolin	Oral gatifloxacin	None	20/60	20/20 at 6 weeks

IV: Intravenous, SC: Subconjunctival, PK: Penetrating keratoplasty

vasculitis was reported earlier. Experimental inoculation of bacteria into the vitreous cavity revealed retinal periphlebitis to be the first clinical feature observed.[6] The pathogenesis of hemorrhages and periphlebitis is attributed to the breakdown of blood–retinal barrier, and thus perivascular exudation of plasma proteins and white blood cells.[8]

Retinal vasculitis as an isolated sign of endophthalmitis has been rarely reported in literature. This could be because of the lack of awareness, rarity of this sign, more fulminant cases or delayed diagnosis or delayed presentation leading to a poor view of fundus. A Medline search revealed only eight similar cases reported so far [Table 1]. Of these, only one case was post-traumatic. These findings may mimic the picture of retinal vein occlusion, Eales' disease, Behcet's, sarcoidosis, pars planitis, infectious retinochoroiditis and non-specific uveitis, but a history of recent open globe trauma or surgery or systemic infection should indicate the possibility of an infectious etiology. In post-surgical eyes with increased anterior chamber reaction, dilated inferior retinal examination should be done to look for such white-centered retinal hemorrhages and vasculitis to rule out early endophthalmitis. A delay in the diagnosis and treatment of endophthalmitis is associated with poor visual recovery. All cases reviewed, including ours, had good visual outcomes with treatment.

Conclusion

Awareness about retinal vasculitis being an early presenting feature could lead to early diagnosis of endophthalmitis and good visual outcome.

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