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Vancomycin-associated retinal hemorrhages in pediatric age group: A case report.

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ABSTRACT

Purpose: To report a case of possible post-lensectomy vancomycin-induced retinal hemorrhages in a 9-month-old infant to raise awareness of this rare postoperative complication in the pediatric age group.

Observation: A retinal vascular occlusion-like findings were noted bilaterally after sequential uneventful pars-plicata lensectomy in a 9-month-old infant during the very early postoperative follow-up (1–2 days). The case was recorded with no remarkable intraoperative events and received intraoperative vancomycin 20μg/ml in irrigating solution (a routine endophthalmitis prophylactic protocol).

Conclusions and Importance: Vancomycin-associated hemorrhagic occlusive retinal vasculitis (HORV) is a rare reported postoperative complication of intraocular prophylactic vancomycin injection. Although all documented cases were reported in elderly patients aged 50 years and above, all presented with almost common findings of occlusive retinal vasculitis. To the best of author's knowledge, this is the first reported case of presumed HORV in pediatric age group. The author finds this of utmost importance to demonstrate the case to expand awareness of this possible complication in the pediatric age group as well.

1. Introduction

The term hemorrhagic occlusive retinal vasculitis (HORV) was first reported in literature in 2014 as case presentation of two cases following uneventful cataract extraction, which has been postulated as an immune repose to intracameral vancomycin injected by the end of surgery, with four additional cases reported in 2015.[1,2]

For reported cases, a picture of ischemic vasculitis with retinal hemorrhages and mild anterior segment reaction was common along with a marked drop of visual potential.[2]

In response to these reports, the HORV task force was formed and a report including 36 eyes with HORV has been published for the clinical characteristics, possible pathogenesis, and management of the disease. All eyes shared common clinical features of unremarkable undilated examination on the first postoperative day, delayed-onset painless vision loss, mild anterior chamber and vitreous inflammation, sectoral retinal hemorrhages in areas of ischemia, predilection for venules and peripheral involvement, and a common documentation ofintraocular prophylactic vancomycin administrationduring uneventful surgical procedures.[3]

In this case report, the author presents a case that manifested as a picture of retinal vein-like occlusion retinopathy following sequential bilateral parsplicata lensectomies with intraocular vancomycin administration on irrigating intraocular solution.

1.1. Case report

A mother presented her 9-month-old male infant with an accidental discovery of a white pupil in his left eye. A thorough ophthalmological examination revealed a case of bilateral lamellar cataract more dense in the left eye, fundus details could not be elicited by indirect ophthalmoscopy; therefore, a bilateral B-scan ultrasonography was done and revealed no ultrasonographic abnormalities regarding the axial lengths, retina, and optic nerve. The infant was orthophoric, fixing and following light with no nystagmus. Routine preoperative laboratory investigations in the form of complete blood count (CBC) with differential count and blood coagulation profile were within normal values. Toxoplasma, rubella, cytomegalovirus, and herpes simplex (TORCH) screen to rule out intrauterine infection was within the normal range. Full family, and perinatal history taking revealed irrelevant data with a negative consanguinity.

Based on the preoperative ophthalmological examination and adjuvant investigations, the infant was diagnosed as a case of bilateral lamellar cataract in an otherwise normal healthy infant and was

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scheduled for bilateral sequential lensectomies and anterior vitrectomy with the left eye being clinically denser than the right eye.

A 20-gauge parsplicata lensectomy and anterior vitrectomy was done by an expert pediatric cataract surgeon with unremarkable intra-operative course.

On routine fundus examination at the first postoperative day, vein occlusion-like retinopathy with mildly dilated retinal veins was noted in the fundus. Retinal hemorrhages involving both posterior pole and peripheral retina were also elicited in all retinal quadrants, with few hemorrhages showing a white-centered appearance (Fig. 1) in an otherwise quiet anterior segment.

Since preoperative fundus examination was not feasible because of the bilateral dense cataract, the possibility of a systemic disease-related bilateral retinopathy was postulated as a possible cause of these retinal findings, and a complete workup to exclude possible blood dyscrasias and associated systemic conditions was performed postoperatively. CBC with differential count, TORCH screen, and blood coagulation profiles were repeated and compared to preoperative reports. Further laboratory workup to exclude hemoglobinopathies and abdominal ultrasound to exclude hepatosplenomegaly or abdominal masses revealed no relevant explanation.

Since it was not common in the pediatric age group before and its clinical presentation was not as classical as the described HORV clinical picture, the possibility of vancomycin-induced retinal hemorrhages was not considered as a priority at that time.

The patient was scheduled for another eye surgery one week later, with the same surgeon, and the fundus was examined by the end of the procedure with unremarkable findings.

One day later, the eye was quiet with no anterior segment reaction. Surprisingly, fundus examination showed a picture similar to that elicited in the first eye with more evident venous dilatation, more retinal hemorrhages, and mild vitreous hemorrhage in a previously noted normal fundus a day before the surgical procedure.

As systemic causes were excluded before, the possibility of vancomycin-induced retinal vasculitis was postulated based on the clinical findings and the course of clinical presentation, as well as the fact that vancomycin was used on the irrigation solutions for both eyes and the patient received bilateral posterior subtenon injection of 1ml betamethasone and systemic oral dexamethasone two daily doses of 0.6 mg/kg/dose for 10 days as recommended by a specialized pediatrician.

Unfortunately, fluorescein angiography could not be done, as the author failed to obtain guardian's consent to inject the dye for the test.

The patient was scheduled for regular follow-up visits on a weekly basis with a noted gradual improvement of his retinal condition (Figs. 2–4), improvement of vascular dilatation, a decrease of retinal hemorrhages, and disappearance of retinal edema as well as improved vitreous hemorrhage in the right eye over a period of 11 weeks.

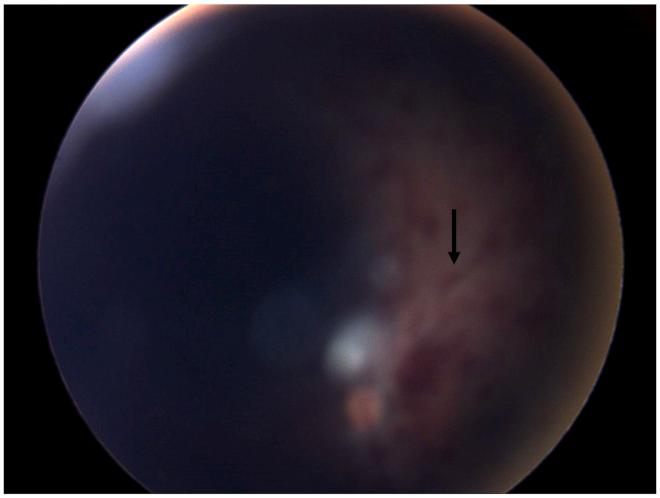
The patient was monitored for the rise of intraocular pressure (IOP) and showed normal measurements and normal ocular alignment with acceptable visual potential all through his follow-up visits.

2. Discussion

The ophthalmology practice showed a great drift toward the use of prophylactic antibiotics during intraocular surgeries to decrease the risk of postoperative endophthalmitis during the last decade.[4,5] Being a wide-spectrum antibiotic against most gram positive species with a potential safe effect on the retina and different ocular structures, the use of intraocular vancomycin has been preferred by many ophthalmologists.[3,6]

HORV—a term describing a group of clinical characteristics of postoperative occlusive vasculitis—was recently introduced in literature with the use of intraocular vancomycin claimed as a possible association.[3]

Vancomycin-associated HORV has been described in elderly patients



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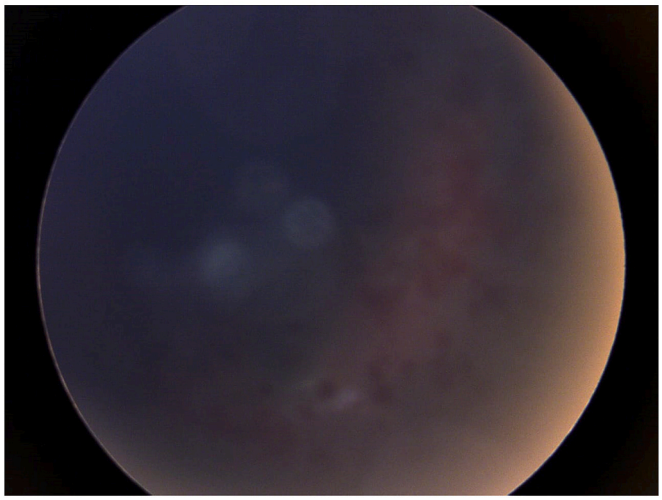

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Fig. 1. Fundus phtoto Left eye captured by Retcam 1st post-operative day.

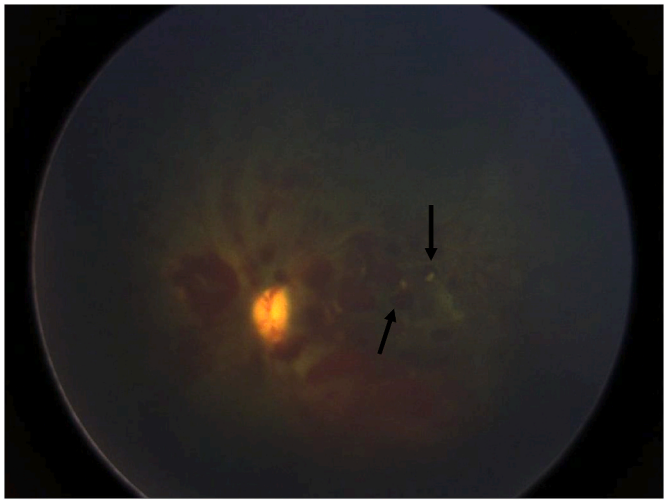
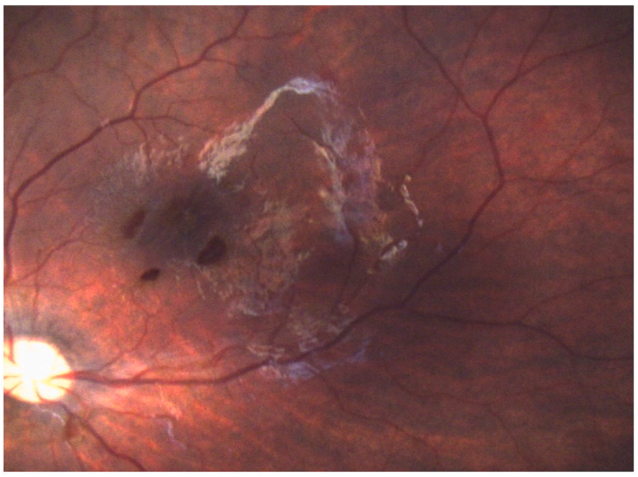


Fig. 2. Left eye 4 weeks post-operative showing white-center retinal hemorrhages (Black arrows), improvement of retinal hemorrhages and no venous dilatation.



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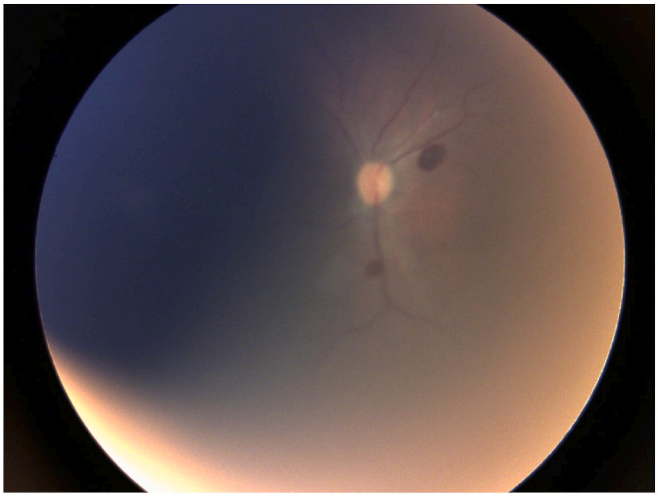

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Fig. 3. Left eye 6 weeks post-operative.

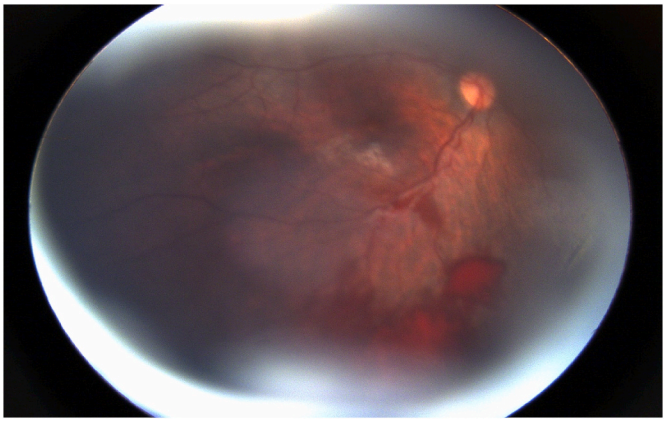

Fig. 4. Fundus photo Right eye 6 weeks post-operative showing inferior paravascular retinal hemorrhages and areas of vitreous hemorrhages.

following cataract surgery with intraocular use of vancomycin being common among all described cases.[1–3]

In the present case, the author encountered a vascular occlusion-like fundus findings in an otherwise normal healthy infant on the first day post uneventful lensectomy procedure with a mirror image like more aggressive findings occurring in the fellow eye after sequential surgery one week apart.

Detection of these vascular changes in a considerably quiet anterior segment during a routine dilated postoperative fundus examination, the involvement of both eyes with a noticeably more aggressive presentation in the second one, common use of intraoperative vancomycin in irrigating solution, and the profound response to posterior subtenon and systemic corticosteroids favor the postulation of vancomycin-associated retinal vasculitis, although the author failed to obtain the guardian's consent to perform fluorescein angiography to confirm evident retinal vasculitis.

Nonetheless, the difference in the age group between the previously recorded cases and the present case may explain the few dissimilarities regarding fundus presentation and the course progression[3]: in previously reported cases the retina commonly showed sectoral involvement with high prevalence of retinal neovascularization and possible neovascular glaucoma with devastating visual disabilities.

Although fundus examination showed an extensive presentation of retinal hemorrhages involving all retinal quadrants, regular periodic clinical follow-ups revealed no retinal neovascularizations and no rise of IOP with the infant, showing a favorable bilateral steady fixation with no clinical evidence of either strabismus or nystagmus.

In this case report, the author could not surely ignore the possibility of vancomycin-induced retinal toxicity, although it is being considered as a safe antibiotic to the retina in different reports; however, the use of the standard prescribed adult dose of 20 μg/ml on irrigating solution still may be questionable in the pediatric age group.[7]

To author's knowledge, this is the first report of possible vancomycin-associated retinal vasculitis in the pediatric age group, which may help raise awareness toward the possibility of encountering this rare complication among the pediatric age group as well.

A routine dilated postoperative fundus examination is highly recommended in all cases and should not be applied only for eventful cases or cases with postoperative reaction given that most of the cases can be easily missed unless a dilated fundus examination is conducted.

Surgeons must reconsider the weight of benefits concerning the intraocular prophylactic antibiotics versus the potential risks of postoperative endophthalmitis as well as other postulated complications such as HORV in cases treated with intraocular vancomycin. Moreover, the dose of intraocular prophylactic vancomycin may be reevaluated in the pediatric age group cases considering the possibility of the dose-related reaction of vancomycin-induced retinal vasculitis.

Patient consent

Written informed consent for the surgical intervention and post operative treatment was received from the patient's guardian. Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

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Intellectual property

The author confirms that I have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing I confirms that I have followed the regulations of my institution concerning intellectual property.

Research ethics

The author further confirms that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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Authorship

The International Committee of Medical Journal Editors (ICMJE) recommends that authorship be based on the following four criteria:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. For more information on authorship, please see http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html#two.

All listed authors meet the ICMJE criteria.

We attest that all authors contributed significantly to the creation of this manuscript, each having fulfilled criteria as established by the ICMJE.

Declartion of competing interest

The author wishes to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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