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CASE REPORT

Gentamicin-induced macular toxicity following flanged intraocular lens fixation

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Key words:

Aminoglycoside toxicity, drug toxicity, flanged intraocular lens fixation, gentamicin toxicity, trans-scleral-fixated intraocular lens

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Abstract

To report a case of gentamicin-induced macular toxicity following subconjunctival injection of gentamicin after flanged intraocular lens (IOL) fixation. A 54-year-old female presented with poor post-operative visual gain following uncomplicated pars plana vitrectomy with dropped nucleus removal and flanged IOL fixation. Clinical examination revealed a patch of retinal opacification at the posterior pole with surrounding cotton-wool spots. Fluorescein angiography demonstrated a sharply demarcated area of retinal ischemia with pruning of the surrounding retinal vessels. The findings were suggestive of gentamicin-induced macular toxicity. A short course of systemic corticosteroids failed to bring about significant improvement and the patient developed retinal atrophy in the area. Subconjunctival antibiotics can gain access into the eye in cases with sutureless transconjunctival flanged IOL fixation. Drugs with known intraocular toxicity such as gentamicin should be avoided in such cases.

Background

Ophthalmic surgery has evolved rapidly over the years to adapt to smaller instrumentation, sutureless surgeries, and topical anesthesia. Secondary intraocular lens (IOL) fixation has in a similar way moved from anterior chamber and iris-fixated IOLs to transscleral suture-fixated and glued IOLs. The recent modification in this field has been the flanged IOL fixation described by Yamane *et al.*,[1] which uses a transconjunctival, trans-scleral, and sutureless IOL fixation approach. As with any sutureless surgery, post-operative endophthalmitis is always the most feared complication. Among other aseptic precautions, experience has suggested the use of subconjunctival antibiotics for the prevention of endophthalmitis. We report a case of gentamicin-induced macular toxicity following subconjunctival gentamicin injection after flanged IOL fixation.

Case Report

A 54-year-old female presented with decrease of vision in her right eye following blunt trauma with a ball 1-month back. Examination revealed aphakia with a dislocated crystalline lens in the vitreous cavity and normal intraocular pressures. Visual acuity improved to 20/30 with aphakic correction. The patient was taken up for the right eye trans-conjunctival 25-gauge pars plana vitrectomy with phacofragmentation-assisted crystalline lens removal and transconjunctival flanged IOL fixation, as described by Yamane *et al.*[1] A separate 20-gauge port was made for the phacofragmentome superotemporally after doing a localized conjunctival peritomy. All sclerotomies (including the transconjunctival ports) were sutured with 7-0 polyglactin sutures. Surgery was concluded with a 1 mL subconjunctival injection of 1:1 mixture of gentamicin (40 mg/mL) and dexamethasone (4 mg/mL) in the inferotemporal quadrant. On post-operative day 1, the patient had a best-corrected visual acuity of counting fingers at 1 m. The cornea was clear with a well-centered IOL and minimal intraocular inflammation. Posterior segment examination revealed a clear media, with whitish opacification of the posterior pole along with multiple cotton-wool spots [Figure 1a]. Fluorescein angiography (FA)

done the same day showed a sharply defined area of retinal capillary non-perfusion at the posterior pole with pruning of the perifoveal retinal vessels [Figure 1b]. In view of the characteristic clinical and angiographic findings, a diagnosis of gentamicin-induced macular toxicity was made. The patient was treated on oral corticosteroids in tapering doses over 6 weeks. At 6-month follow-up, the patient had a best-corrected visual acuity of 20/200 with normal intraocular pressures. The retinal edema had resolved with atrophy in the area of the ischemia. No further intervention was planned and the patient was counseled regarding the poor visual prognosis.

Discussion and Conclusion

We present a case of gentamicin macular toxicity following subconjunctival injection in a patient with flanged intrascleral IOL fixation. Postoperatively, on recognizing the complication, FA was ordered to rule out infective retinitis and the surgical video was reviewed to rule out inadvertent intraocular injection of gentamicin. In the flanged IOL fixation technique by Yamane *et al.*,[1] the haptics of the IOL are pushed back into the scleral tunnel transconjunctival and the conjunctiva is rolled over it. In our case, all the sclerotomies were sutured and the only possible entry of gentamicin in the eye could be through the scleral tunnels alongside the IOL haptics.

The patient had minimal cellular reaction in the anterior chamber and the FA was not suggestive of infective retinitis. Hence, there was no role of systemic/intravitreal antimicrobials. The FA revealed a sharply demarcated area of retinal ischemia, away from the optic disc. This ruled out the possibility of cilioretinal artery occlusion. The toxicity due to gentamicin occurs due to chemical injury to the retina and leads to ischemia within 5–10 min in the area over which gentamicin settles down.[2,3] Immediate vitreous lavage with copious amounts of balanced salt solution is the only treatment that has been shown to be effective in preventing toxicity after inadvertent intravitreal injection of gentamicin.[4] In our case, since the complication was detected the next day after surgery, this was not an option. Prevention of this sight-threatening iatrogenic complication is probably the best possible solution.

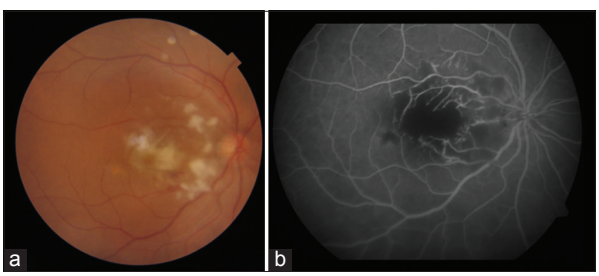

Figure 1: Gentamicin-induced macular toxicity following flanged intraocular lens fixation. (a) Post-operative day 1 fundus picture of the right eye showing patches of retinal opacification at the posterior pole with cotton-wool spots. (b) Fluorescein angiogram showing sharply defined area of retinal capillary non-perfusion corresponding to the retinal opacification with pruning of the surrounding retinal vessels

The role of subconjunctival antibiotics after pars plana vitrectomy for the prevention of endophthalmitis has been questioned recently, with there being little evidence of any difference in the rates of endophthalmitis with and without their use.[5] Subconjunctival use of gentamicin has been previously reported to cause retinal toxicity, especially in cases with scleral thinning, large corneal incisions, unsutured sclerotomies, and/or inadvertent intraocular perforation.[6-9] Gentamicin toxicity is also known to occur at lower doses in vitrectomized eyes.[10] This report cautions about the possibility of this catastrophic complication happening in eyes undergoing transconjunctival, trans-scleral, and sutureless flanged IOL fixation – a technique that is gaining popularity these days.

Declarations

Ethics approval and consent to participate: Yes
Consent for publication: Yes
Availability of data and material: Available to all authors
Competing interests: None
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