

## Precipitation of Vancomycin and Ceftazidime on Intravitreal Injection in Endophthalmitis Patients

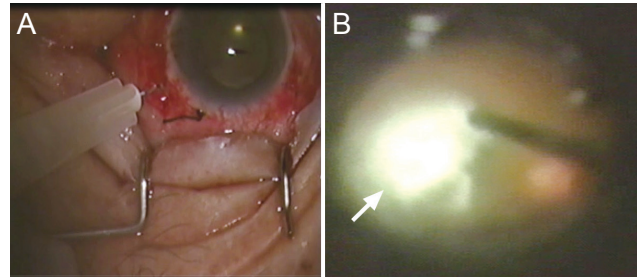
Dear Editor,

Infectious endophthalmitis remains a serious postoperative complication of cataract surgery and vitrectomy. It is an urgent condition because it can cause blindness. Intravitreal vancomycin is considered the treatment of choice for gram-positive bacteria while ceftazidime is a broad-spectrum antibiotic frequently used in combination with vancomycin [1]. However, vancomycin and ceftazidime are incompatible for syringe mixing because of precipitation [2]. Previous studies have investigated the cause of this precipitation [3,4].

We report an endophthalmitis patient whose eye showed formation of a white intravitreal precipitate soon after intravitreal antibiotic injection of ceftazidime and vancomycin. Through this case, we want to emphasize certain points of the procedure.

A 74-year-old woman presented with visual disturbance, ocular pain, and redness in her right eye 2 days after phacoemulsification with intraocular lens implantation at a local clinic. Written informed consent from the patient was obtained. Slit-lamp examination showed an edematous cornea with Descemet membrane folding, active anterior chamber reaction with hypopyon, posterior synechiae, fibrous membrane, and vitreal opacity. We performed an emergency operation for anterior chamber irrigation and pars plana vitrectomy followed by intravitreal antibiotics injection. First, the patient received an intravitreal injection of vancomycin (1 mg/0.1 mL; Hanomycin, Samjin Pharm, Seoul, Korea). She then received an intravitreal injection of ceftazidime (2 mg/0.1 mL; Tazime, Hanmi Pharm, Seoul, Korea) (Fig. 1A).

Immediately after ceftazidime injection, retinal red reflex disappeared. Examination of the retina and vitreous with a surgical microscope showed a white precipitate in the vitreous cavity (Fig. 1B). An infusion line was inserted



**Fig. 1.** Photographs of the procedure. (A) Intravitreal antibiotic injection with a 30G needle and 1cc syringe. (B) After pars plana vitrectomy and intravitreal injection. The presence of precipitation (arrow) on the endophthalmitis patient's fundus (surgeon view). Written informed consent from the patient was obtained.

and the precipitate was removed.

Intravitreal injection of vancomycin and ceftazidime is frequently used to treat infectious endophthalmitis [1]. However, Lifshitz et al. [2] have reported that vancomycin and ceftazidime are incompatible for intravitreal injection. A previous study has investigated factors affecting precipitation of vancomycin and ceftazidime during intravitreal injection and found that precipitate formation is correlated with antibiotic diffusion rate and increased lower temperatures [5].

In conclusion, precipitation may occur when intravitreal vancomycin and ceftazidime injections are performed simultaneously after pars plana vitrectomy. Based on this case, an operator should be careful when performing this procedure. To avoid such events, the operator may inject antibiotics at different ocular sites with different syringes. Furthermore, enough injection time should be given so that the drugs can each spread at the injection site. In addition, it is important to ensure that the infusion fluid is not too cold [5].

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## Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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