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Systemic Minocycline Treatment of Methicillin-resistant *Staphylococcus aureus* in Giant Fornix Syndrome

Dear Editor,

Rose [1] first reported on giant fornix syndrome which can be an unrecognized cause of chronic relapsing purulent conjunctivitis in elderly patients. Conjunctivitis in giant fornix syndrome usually presents with an upper capacious fornix, which is lodged with proteinaceous debris and colonized with bacteria, commonly *Staphylococcus aureus* [1]. Several previous reports have found that using broad spectrum topical antibiotics, systemic antibiotics, and topical steroids is effective [2].

We describe a case of methicillin-resistant *Staphylococcus aureus* (MRSA) chronic conjunctivitis in giant fornix syndrome that was recalcitrant to topical treatments but was successfully and rapidly treated after systemic minocycline treatment.

An 82-year-old woman presented with chronic persistent mucopurulent conjunctivitis of the left eye. She had been treated unsuccessfully for 4 months. She was currently using topical chloramphenicol eyedrops and oxytetracycline ointment. She received cataract surgery on both eyes 18 months ago but did not have any other ocular history.

The patient's uncorrected visual acuity was 20 / 250 and intraocular pressures were within normal limits. Slit-lamp examinations showed thick coagulum and yellowish mucoid discharge at the conjunctival sac (Fig. 1A and 1B) and multiple conjunctival papillae and follicles. The corneal surface was irregular with diffuse punctate epithelial erosions, as seen in toxic keratopathy (Fig. 1C). By everting her upper eyelid, the superior fornix was revealed to be deep and filled with plenty of thick coagulum. Blepharoptosis due to age-related disinsertion of the levator muscle aponeurosis was greater in the left and the left eyelid was swollen (Fig. 1D). There were signs of blepharitis such as erythema and telangiectasis in both eyelids. The all lacrimal drainage systems were open and showed no pus drainages. A computed tomography scan of the orbit did not reveal any evidence of orbital cellulitis. Based on the clinical findings, giant fornix syndrome was diagnosed.

A conjunctival culture was performed. The patient was administered topical moxifloxacin every 2 hours and 1% prednisolone acetate every 6 hours. Lid management using warm compression and cleanser was started. She refused any systemic antibiotics because she was already taking several other medications prescribed by other departments. One week later, conjunctival injection and pus drainage were slightly improved but still bothering her. The culture

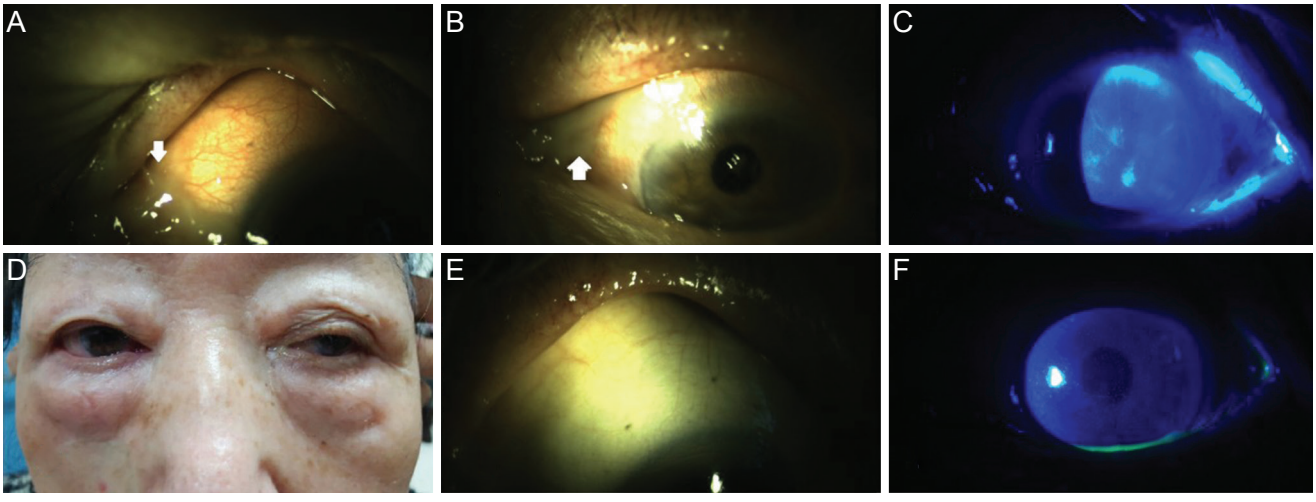

Fig. 1. On examination, the patient's left eye presented a deep forniceal space and erythema and telangiectasis on the eyelid (A,B) with coagulum (arrow). Staining with fluorescein (C) showed a persistent epithelium defect. External photo of the patient's eye (D) showed slight blepharoptosis and swelling on the left eye. After 2 weeks of systemic minocycline treatment, the fornix (E) and corneal surface (F) were normal. The eyelid and fornix had normal clearance without discharge and the corneal surface was improved. Informed consent was received from the patient.

results revealed MRSA sensitive to tetracycline, vancomycin, and tigecycline. Fifty mg/mL vancomycin eyedrops and topical steroid were added to her treatment regimen. Lid management with fornix sweeping was continued.

However, 3 weeks later, purulent conjunctivitis relapsed despite continuous treatment. The patient agreed to add oral minocycline 50 mg bid to control her blepharitis and meibomian gland dysfunction which could be a source of bacteria. After 2 weeks, the patient's eyelid, corneal surface, and uncorrected visual acuity had all improved (Fig. 1E and 1F). The treatment was maintained for 1 month. She continued once-daily dosage of a topical steroid-antibiotic ointment and lid management to prevent recurrence. Two months after discontinuation of minocycline, the patient remained clinically cured.

In giant fornix syndrome, the ocular surface is damaged due to chronic toxicity of the bacterial and inflammatory cell exudates, and the toxicity further exacerbates inflammatory and infective status [1]. This vicious cycle leads to severe chronic relapsing conjunctivitis [1-3]. Routine low-dose topical antibiotic therapy is not effective because the organism exists in the proteinaceous coagulum within the large upper fornix [1,3].

In previous reports of giant fornix syndrome, *Staphylococcus aureus* sensitive to most antibiotics was the major pathogen, however, some cases of MRSA infection have been recently reported. Therefore, other treatment options such as povidone-iodine washings with local injection and surgical techniques should be considered [3].

In this case, the patient's chronic relapsing conjunctivitis was recalcitrant to high dose topical antibiotic and steroid along with sweeping of the fornix. However, after systemic minocycline treatment, symptoms and signs rapidly and completely improved. Systemic minocycline decreases the eyelid bacterial flora in blepharitis and suppresses inflammation by affecting cytokines and reactive oxygen species [4]. Staphylococcal species present in typical conjunctival flora are especially susceptible to minocycline compared to other antibiotics [5]. Therefore, systemic minocycline treatment can significantly reduce the bacterial load and suppress the toxic inflammatory condition.

In conclusion, we reported a case of a patient with MRSA chronic conjunctivitis in giant fornix syndrome that was successfully treated with systemic minocycline leading to a rapid and complete recovery.

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Conflict of Interest

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

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