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Case Series of Cornea Bee Sting: Different Approaches of Management

***Abstract*—**Cornea bee sting is a rare condition with mild to severe complications. We report a case series of three patients with cornea bee sting presented to a tertiary center. All patients sustained embedded stingers in the cornea stroma and presented within a few hours of injuries. All patients received topical antibiotics, topical steroids and removal of stingers. However, techniques of stinger removal and administration of the medications are among factors that contributed to different outcomes in these patients

***Keywords*—Cornea bee sting, ulcer, toxic keratopathy.**

1 INTRODUCTION

Cornea bee sting is a rare condition. Prevention of secondary infection and minimizing the toxic effects are contributing to a better visual prognosis. Here, we describe the clinical course of three patients with cornea bee sting injuries whom were managed with different approaches and resulting in variable outcomes.

2 METHODS

This case series described three cases of cornea bee sting with embedded stinger that were admitted to Hospital Raja Perempuan Zainab II, Kelantan, Malaysia in the year 2017. Patients' case notes were reviewed for demographic details, clinical findings and management.

3 RESULTS

3.1 Patient 1

A 60-year-old man with uneventful medical history, alleged had a bee sting over his right eye while lawn mowing. He presented to us 6 hours post injury. On examination, right eye visual acuity was finger counting. Anterior segment examination showed conjunctival injection, generalized cornea oedema with presence of a stinger in the corneal stroma and a large epithelial defect. No cornea infiltrate or hypopyon was noted. The stinger was removed immediately at the slit lamp by using a forceps. He was started with topical Ciprofloxacin 0.3% hourly and Gentamycin 0.1% ointment. On the following day, his ocular condition became worse with evidence of stromal infiltrate and hypopyon. He was admitted to the ward, and topical antibiotic was changed to Moxifloxacin 0.5% hourly and Dexamethasone 0.1% 8-hourly was added. Subsequently topical Dexamethasone 0.1% was increased to 4 hourly after healing of epithelial defect. Topical antibiotic and corticosteroids were continued and tapered down gradually over three months period. His final best corrected vision was 6/12 due to cornea scarring lateral to visual axis and bullae at inferior medially (Figure1). There was immature cataract and posterior segment examination was unremarkable.

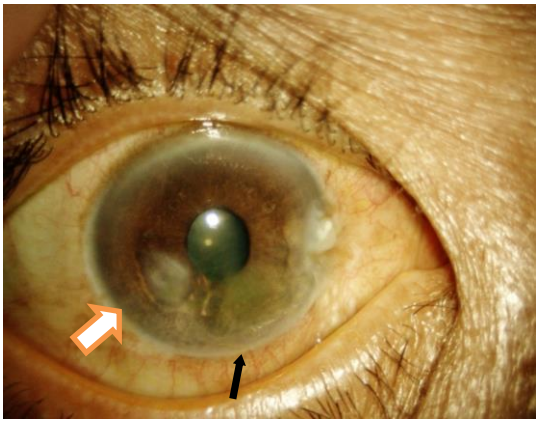

Figure 1: Thick arrow showed cornea scarring from healed ulcer; Thin arrow showed bullae.

3.2 Patient 2

A 55-year-old man alleged had multiple bee stings generalized to the body including a direct sting to the left eye. He presented to the hospital 3 hours post injury with left visual acuity of 2/60. Ocular examination revealed injected conjunctiva, oedematous cornea with Descemet's folds and presence of a stinger in the corneal stroma. No cornea infiltrate or hypopyon was noted. Posterior segment was normal. Systemic examinations showed no evidence of anaphylactic reaction. He was treated with systemic steroids for anaphylactic prophylaxis. For his eye, he received topical ciprofloxacin 0.3% hourly and Betamethasone 0.05% 4hourly. On the following day, he underwent stinger removal. On the third day, the condition worsened with evidence of infiltration (Figure 2). Antibiotic was changed to Moxifloxacin 0.5% hourly and topical steroid was increased to 2hourly as he had developed toxic keratopathy. The cornea healed with scarring after 2 months of tapering topical antibiotic and steroid treatments. However, he developed anterior subcapsular cataract which result in vision impairment.

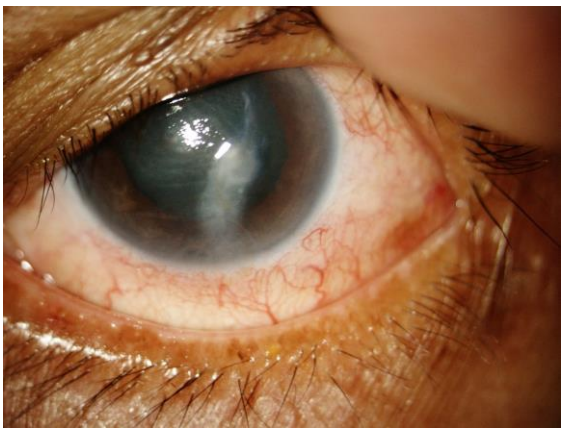

Figure 2: Left eye anterior segment photo showed cornea infiltrate with cornea edema.

3.3 Patient 3

A healthy 14-year-old boy alleged had bee sting over his left eye while riding his motorcycle. He presented to us 5 hours post injury and visual acuity was 6/12. Left eye conjunctiva was injected with the presence of a stinger embedding through full thickness of the cornea at the visual axis (Figure 3). No corneal infiltrate or hypopyon was noted. The stinger was unable to be removed at slit lamp because the tip of stinger was inaccessible. He was started with topical Betamethasone 0.05% 2 hourly. The stinger was removed in the operation theatre under general anesthesia and anterior chamber irrigation was performed. He was treated aggressively with topical steroid, Moxiflixacin 0.5% and cycloplegic after operation. There was no sign of toxic keratopathy thereafter except scarring at the corneal wound and his vision improved to 6/6.

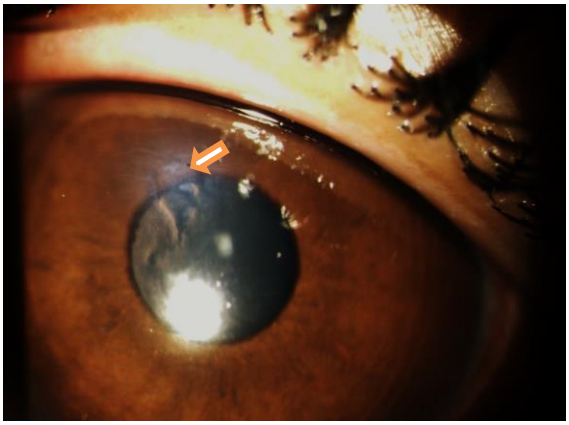

Figure 3: Embedded stinger in the cornea.

4 DISCUSSION

There are several cases of cornea bee sting that have been reported and complications vary from mild to severe. These include cornea oedema with infiltrate, anterior uveitis, cataract, optic neuropathy or retinitis. The approach to cornea bee sting must account the penetration, immunological and toxic injuries [1]. However, most of the complications resulted from toxic or immunological reactions toward the injected venom [2].

The stinger can be more than 1mm long and can penetrate the entire thickness of the cornea [3]. Each sting can introduce around 50µg of venom [3]. The venom contains nonezymatic polypeptides toxins (Melittin, apamin, iminimine and mast-cell peptide) and enzymatic toxins like phospholipase A, phospholipase B, and hyaluronidase [3,4]. It is the enzymatic toxins with high molecular weights that are responsible for immunological response following bee sting via type 1 hypersensitivity [3,4]. It has also been reported that apamin has neurotoxic effect that will result in optic neuritis or third nerve palsy [3,4].

The primary aim of cornea bee sting treatment is to control the inflammatory response.

It is generally well accepted to start high dose topical steroid as early as possible. As seen in patient 1, although he had early removal of the stinger, but the delay in treatment with topical steroid had caused the condition to deteriorate as evidenced by stromal infiltrate and hypopyon. In patient 2, he was started with topical Betamethasone 4 hourly and subsequently developed severed toxic keratopathy and anterior segment inflammation. This could be due to inadequate steroid treatment as the majority of authors started with topical prednisone hourly or 2 hourly [3,5,6]. Kim *et al*. addressed a case of cornea bee sting by treating with systemic high dose steroid and topical steroid [5]. The patient had obtained good outcome with visual recovery and cornea clarity in 5 days. Topical antibiotic is indicated in all cases for possible bacterial contamination. Cycloplegic drug can be given for pain management to reduce the ciliary spasm.

Removal of retained stinger is still controversial. Some authors suggest that removal of retained stinger is not required providing patients have no adverse ophthalmic complications [7]. They believe that once the stinger is being neutralized, it becomes an inert foreign body and can remain within the cornea without causing further adverse reactions. Gilboa *et al.* reported a case of cornea bee sting where the stinger remained in cornea for 28 years without ocular complications [1].

However, most authors suggested removal of stinger if the injury cause early cornea reactions such as edema, infiltration or inflammation [5]. Visscher *et al.* suggests that removal of stinger should be done as soon as possible as the amount of venom injected correlates with the amount of time it remains within [8]. However, in patient 3, there was a delay in removing the stinger but it did not result in any cornea reactions. This was most probably due to early initiation of high dose topical steroid that suppressed the inflammation or hypersensitivity reaction. Patient 1 and patient 2 had worsening of toxic keratopathy after external removal of bee stinger. This could be due to the pinching action of the stinger that might enhanced envenomisation. Furthermore, the stingers removal were done directly via external approach without any cornea surface incision. Excessive external manipulation of embedded stinger that released more toxins could be one of the reasons that caused the worsening condition as seen in both patients. In patient 3, a different approach was done where the stinger was pushed into anterior chamber and grabbed with forceps followed by irrigation of anterior chamber with balanced salt solution to minimize the circulating toxins. This approach was reported by Velez *et al.* where it showed faster resolution and fewer complications following similar injury. [9]

In the present case series, each cornea bee sting has different outcome due to different management approach as illustrated above. Another reason that could explain the differences in the outcomes are different species of hymenoptera and variations in the composition of venom components that could result in different degrees of toxic and immunologic reactions. Bee sting tend to have better prognosis compared to wasp sting [10].

5 CONCLUSION

In conclusion, managing cornea bee sting should start with high dose steroid. Broad spectrum topical antibiotics are used to prevent secondary infection. Early removal of stinger should be done if there is early cornea complication or stinger located at visual axis. Performing an anterior chamber irrigation might minimize the tissue damage induced by bee venom.

CONFLICTS OF INTEREST

The authors have no conflicts of interest in this case series.

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