Exotropia in a pediatric patient with rhabdomyolysis caused by an insect sting

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Various ocular and systemic reactions have been associated with insect sting. However, insect stings have been rarely reported to cause exotropia and diplopia. We encountered exotropia in a 6-year-old child with rhabdomyolysis of the left lower extremities caused by an insect sting. Exotropia and diplopia developed within 1 day after the sting and improved completely 1 week after the onset of symptoms. Clinicians should be aware of the potential for the development of exotropia in patients with insect stings, which requires careful follow-up.

Key words: Exotropia, rhabdomyolysis, sting

Insect stings can result in local allergic and severe systemic reactions, including rhabdomyolysis, renal failure, liver injury, and coagulopathy. A range of ocular reactions such as corneal edema, conjunctivitis, cataract, and optic neuritis have been reported after insect stings. These reactions were attributed to direct trauma and potential toxic effects. However, insect sting has been rarely reported to cause strabismus. To the best of our knowledge, this paper describes the first reported pediatric case in a 6-year-old boy who developed exotropia with rhabdomyolysis caused by an insect sting.

Case Report

Informed consent was obtained from patient’s parent. A 6-year-old boy consulted our pediatric ophthalmology department for horizontal diplopia. He was admitted to the Pediatric Department and diagnosed with rhabdomyolysis after an insect sting. His mother reported that he had been stung by an insect.

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He reported feeling a mild itching sensation at the time of the sting at the left knee. However, the patient had generalized edema, and ecchymosis extending from the sting site to the proximal and distal part of the left lower extremity on the evening that he visited the medical service [Fig. 1a and b]. One day later, he began complaining of horizontal diplopia.

The initial laboratory results were as follows: White blood cell count of 13,260/μl (normal: 4000–10,000), blood urea nitrogen of 11.42 mg/dl (8–23), serum creatinine of 0.46 mg/dl (0.6–1.5), creatine phosphokinase (CPK) of 16,464 IU/L (57–374), lactate dehydrogenase of 1229 IU/L (150–550), myoglobin of 265 ng/ml (19–92), aspartate aminotransferase of 456 IU/l (10–35), and alanine aminotransferase of 173 IU/L (0–46). CPK level, which is a reliable and sensitive indicator of muscle injury, was significantly increased as shown by the laboratory findings.

No abnormal findings were observed in the blood coagulation studies, and the result of the urine analysis was normal. His mother reported that he had no prior history of strabismus or objective diplopia. There was no family history of strabismus. The corrected visual acuity was 20/20 in both eyes. The color vision test using Ishihara plate was normal.

Figure 1: (a) Diffuse edema and ecchymosis of the left lower extremity without sign of necrosis. (b) A single sting mark was visible on the left knee (arrow)

Figure 2: (a) Images of the case in nine diagnostic position of gaze, demonstrating extropia of the right eye without definitive adduction limitation. (b) One week after its onset, the exotropia had improved and the patient had no diplopia
Among these reactions, the large proximal limb muscles (1:2000). The extraocular muscles have a higher ratio of nerve fibers in the cases of strabismus after a snake bite, was considered. The possibility of a potential toxin affecting the neuromuscular junction, as ruled out through MRI with CISS sequences. The possibility of an acute structural problem in orbit was considered. Based on the sting mark and the parent’s statements. Tick or fire ants were the suspected offender in the current case, based on the sting mark and the parent’s statements. The insect could not be identified. Since there have been reports of exotropia after snake bites, the possibility of snake bite was also considered initially. However, the possibility of snake bite was ruled out for the following reasons. First, no fang mark suggesting a snake bite was observed. One bite mark was observed on the knee. Second, previous cases of exotropia after snake bite usually have a bite site at the finger rather than the knee as in the present patient. Third, the patient’s mother had been with her child at the camping site and did not report seeing a snake. Fortunately, the patient showed stable improvement without further complications. In this case, the insect could not be identified. Since there have been reports of exotropia after snake bites, the possibility of snake bite was also considered initially. However, the possibility of snake bite was ruled out for the following reasons. First, no fang mark suggesting a snake bite was observed. One bite mark was observed on the knee. Second, previous cases of exotropia after snake bite usually have a bite site at the finger rather than the knee as in the present patient. Third, the patient’s mother had been with her child at the camping site and did not report seeing a snake. In the right and left gaze position, he had 25 PD exotropia. The Worth 4-dot test showed diplopia at a distance and near. No other abnormal ocular findings were noted. Cerebrospinal fluid analysis revealed normal findings, and cultures were negative. Brain magnetic resonance imaging (MRI) including three-dimensional constructive interference in the steady state (CISS) through the brainstem to visualize the cisternal segments of the cranial nerves and the orbit showed no abnormalities. One week after the onset of diplopia, he felt that the diplopia had improved. He was orthotropic under prism and alternate cover test and had no diplopia [Fig. 2b]. The worth 4-dot test showed fusion at a distance and near.

Discussion
Several reports have shown that insect stings can cause both local and systemic reactions. Among these reactions, strabismus is rare. Bee or tick stings have been reported to be associated with exotropia and abducens nerve palsy. To the best our knowledge, there are no previous reports of exotropia in a child after an insect sting. In addition to strabismus, our patient showed rhabdomyolysis in his left lower extremity. Rhabdomyolysis after an insect sting in children can cause acute renal failure and other potentially fatal symptoms, necessitating immediate treatment, and close monitoring. Fortunately, the patient showed stable improvement without further complications. In this case, the insect could not be identified. Since there have been reports of exotropia after snake bites, the possibility of snake bite was also considered initially. However, the possibility of snake bite was ruled out for the following reasons. First, no fang mark suggesting a snake bite was observed. One bite mark was observed on the knee. Second, previous cases of exotropia after snake bite usually have a bite site at the finger rather than the knee as in the present patient. Third, the patient’s mother had been with her child at the camping site and did not report seeing a snake. In conclusion, exotropia and diplopia can develop after an insect sting, and may gradually improve. Unusual reactions related to insect stings, including both ocular and systemic reactions, can occur. Clinicians need to be aware of the potential for the development of exotropia in patients with insect sting, which may require careful follow-up.

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Conflicts of interest
There are no conflicts of interest.

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