CASE REPORT

Eye Injury After Jellyfish Sting in Temperate Australia

Kenneth D. Winkel, MBBS, PhD; Gabrielle M. Hawdon, MBBS, MPH; Karen Ashby, Grad Dip HealthSc, BA; Joan Ozanne-Smith, MBBS, MPH, MD

From the Australian Venom Research Unit, Department of Pharmacology, University of Melbourne, Victoria, Australia (Drs Winkel and Hawdon), and the Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre, Victoria, Australia (Ms Ashby and Dr Smith).

Although jellyfish stings are an uncommon medical problem in temperate Australia, significant morbidity can occur, particularly in association with infestations of large numbers of jellyfish in public swimming areas. We report a case of a jellyfish sting-related eye injury, probably caused by the “hair” jellyfish (*Cyanea capillata*) from southeast Australia. The patient, a 54-year-old man, was stung while swimming without goggles in a jellyfish-infested bay. He experienced severe pain in his right eye, requiring narcotic analgesia, and had decreased visual acuity associated with right-sided facial swelling. Although usually brief and self-limiting, eye injuries after jellyfish stings should be assessed and treated as early as possible to reduce the risk of longer term sequelae. Water safety campaigns should incorporate information on the prevention and early treatment of such stings.

Key words: jellyfish stings, envenomation, Cnidaria, *Cyanea capillata*, marine stings, hair jellyfish, eye injury, emergency and environmental medicine, Australia

Introduction

Jellyfish stings are a common summer hazard for sea bathers throughout the world. It is estimated that in excess of 10 000 jellyfish stings occur in Australia each year.¹ These injuries are particularly well described in the tropical waters of northern Australia, where stings from the “box jellyfish” (*Chironex fleckeri*) may cause devastating and occasionally fatal injuries.¹ By contrast, relatively little has been reported of jellyfish stings occurring in more temperate Australian waters.² We report a case of jellyfish sting-related eye injury that occurred in southeast Australia to illustrate one of the hazards of temperate water jellyfish stings.

Case report

A 54-year-old man presented to the emergency department in a Melbourne hospital one morning in February 1997 complaining of a jellyfish sting to the right side of his face. He had been swimming in Port Phillip Bay, close to the hospital, immediately before presentation.

The patient was a keen swimmer who had suffered jellyfish stings on previous occasions without significant ill effects. He had no other important medical history events and was not taking any medications.

On presentation, the patient complained of severe pain in his right eye and decreased visual acuity. On examination, he had gross swelling of the right lip and eyelid. The swelling impeded adequate eye examination, and he was treated with copious irrigation of normal saline to the conjunctiva, topical anaesthetic and antibiotic drops, oral antihistamines, and intramuscular antiemetic and narcotic analgesia. Over the next 30 minutes, the facial pain and swelling worsened. He was given further narcotic analgesia and transferred to a specialist Eye and Ear Hospital, in the same city, for further assessment and management.

Upon arrival at the specialist hospital, his eye pain had considerably diminished. On examination, mild conjunctival injection was noted with patchy fluorescein staining of the tarsal aspect of the right upper lid. The intraocular pressures were normal, and the anterior chamber was deep and quiet. Saline irrigation was repeated, and chloramycetin ointment was applied. He was discharged with advice to return if pain and visual deterioration persisted. The patient had not re-presented by the time of chart review (1 year postinjury).

Corresponding author: Ken Winkel, MBBS, PhD, Australian Venom Research Unit, Department of Pharmacology, University of Melbourne, 3010 VIC, Australia (e-mail: kdw@unimelb.edu.au). (Reprints will not be available from the authors.)

Discussion

Jellyfish stings in temperate Australia typically cause short-lived and localized effects rather than the severe constitutional symptoms attributable to more tropical jellyfish. These localized signs and symptoms classically include sting site pain, erythema, and sometimes a wheal or other skin lesion. Such stings are caused by the “blue-bottle” (*Physalia* sp) and, to a lesser extent, the “hair jellyfish” (*Cyanea capillata*), the “blubber” (*Catostylus mosaicus*), and the “jimble” (*Carybdea rastoni*).^{3,4} However, even these less “toxic” jellyfish have the potential to cause systemic illness such as an “Irukandji-like” syndrome,⁴ anaphylaxis,⁵ and problematic regional injuries such as thrombophlebitis⁶ and ophthalmological injury.^{2,7}

Eye injuries related to jellyfish stings have been noted around the world, but particularly in temperate regions such as Chesapeake Bay,⁸ and have been attributed to a variety of jellyfish species.^{2,7-9} Such reports typically describe transient corneal abrasions and associated inflammation due to the penetration of toxin-coated threads into the cornea, conjunctiva, and lids.⁹ Fortunately, as seen in this case, most such injuries resolve within 24 to 48 hours. However, the potential for longer term sequelae exists. Infrequently, for example, more serious complications may occur, including iritis, chronic unilateral glaucoma, mydriasis with decreased accommodation, iris depigmentation, and visual blurring.⁹ These can be quite severe and persistent. Indeed, mydriasis and decreased accommodation persisting for more than 2 years have been reported after stings from the “sea nettle” (*Chrysaora quinquecirrha*).⁸ Fortunately, the iritis responds to topical corticosteroids, and the elevated intraocular pressure responds to topical beta blockers and oral carbonic anhydrase inhibitors.⁸

In Australia, 5 cases of ocular injuries, attributed to 2 different species of jellyfish, have been described.^{2,7} The first was reported in 1944 from New South Wales, in central eastern Australia, after what was probably a “bluebottle” sting (*Physalia* sp)⁷—these “jellyfish” are smaller than the related “Portuguese man-of-war.”⁴ In that case, a 22-year-old female surfer developed severe eye pain, which, although it diminished over time, persisted for several weeks. As with the case reported here, her initial ophthalmological examination was unremarkable—demonstrating slight ciliary injection without fluorescein staining. Fortunately, although her full recovery took 5 weeks, there was no visual impairment.

In the summer of 1960–61, Port Phillip Bay was infested with large numbers of *Cyanea annaskala* (synonymous with *C capillata*) jellyfish. This resulted in a series of ophthalmological injuries in 4 young men who

had been swimming beneath the surface with open eyes.² As with the most recent case, those earlier stings were characterized by immediate and severe pain, eyelid swelling, conjunctival injection, and transient visual deterioration. Such symptoms lasted 2 to 7 days and were mostly treated with an eye pad and antibiotics. One case required topical homatropine and hydrocortisone. The same species was also found in large numbers in Port Phillip Bay during the summer of 1997–98¹⁰ (see Figure). This latter infestation was coincident with the sting we report. Such were the numbers of jellyfish that on Sunday, February 6, 1997, the Victorian Environmental Protection Authority warned swimmers to keep out of high-risk areas of the Bay after hundreds of people were reported stung.

Specific management strategies involving nematocyst removal or inactivation are necessarily limited by concern over inadvertent triggering of undischarged nematocysts and further mechanical damage to the injured eye. For example, as there is significant variation in the response of different nematocysts to potential inhibitors,^{3,4} the topical application of substances such as vinegar is not recommended as a first-aid method for jellyfish sting eye injuries. Another consideration in the use of such solutions, in this context, is their lack of sterility. Given the transient nature of most of these injuries, we therefore reiterate the recommendation of topical corticosteroid therapy and cycloplegia for the initial treatment of stings involving the cornea and the avoidance of mechanical or chemical means of nematocyst neutralization in the same context.⁸

Clearly, prevention of this type of injury depends on simple measures such as keeping out of the infested waters and not swimming underwater with eyes open unless goggles are worn. Public health campaigns relating to water safety should incorporate information on when and where jellyfish stings are likely. When they do occur, these injuries, although usually brief and self-limited, should be assessed and treated as early as possible to reduce the risk of longer term sequelae.

Acknowledgments

The authors wish to thank Dr Brian Woodward, Director of the Emergency Department at Williamstown Hospital, and Dr Robyn Meuseman, Ophthalmology Registrar at the Royal Victorian Eye and Ear Hospital, for case details; Mr David Wrobel of the Monterey Bay Aquarium and Research Institute for his photograph and Prof Joseph W. Burnett, Department of Dermatology, University of Maryland, for manuscript advice. The study was supported by the Victorian Health Promotion Foundation through its funding of the Victorian Injury

Photograph of the "hair" jellyfish (*Cyanea capillata*) by David Wrobel.

Surveillance and Applied Research System, a project of the Monash University Accident Research Centre. We thank the Victorian Department of Human Services for financial support to the Australian Venom Research Unit.

References

1. Fenner P, Williamson J. Worldwide deaths and severe envenomation from jellyfish stings. *Med J Aust.* 1996;165: 658–661.
2. Mitchell J. Eye injuries due to jellyfish (*Cyanea annaskala*). *Med J Aust.* 1962;2:303.
3. Fenner P, Williamson J. Experiments with the nematocysts of *Carybdea rastonii* ("jimble"). *Med J Aust.* 1987;147: 258–259.
4. Fenner P, Williamson J, Burnett J, Rifkin J. First aid treatment of jellyfish stings in Australia. Response to a newly differentiated species. *Med J Aust.* 1993;158:498–501.
5. Togias A, Burnett J, Kagey-Sobotka A, Lichenstein L. Anaphylaxis after contact with a jellyfish. *J Allergy Clin Immun.* 1985;75:672.
6. Ingram D, Sheiner H, Ginsberg A. Mondor's disease of the breast resulting from jellyfish stings. *Med J Aust.* 1992; 157:836–837.
7. Hercus JM. An unusual eye condition. *Med J Aust.* 1944; 1:98.
8. Glasser DB, Noell MJ, Burnett JW, Kathuria SS, Rodrigues MM. Ocular jellyfish stings. *Ophthalmology.* 1992;99:1414–1418.
9. Glasser DB, Burnett JW, Kathuria SS, Rodrigues MM. A guinea-pig model of corneal jellyfish envenomations. *Toxicon.* 1993;31:808–812.
10. Kermond C. Jellyfish invasion puts the heat on crowded beaches. *The Age.* January 15, 1997:A2.