

CASE REPORT

A CAT-BITE WOUND INFECTED WITH *VIBRIO ALGINOLYTICUS* FOLLOWING USE OF SEA CUCUMBER OIL

NA Mohamed¹, PG Joseph¹, H Hussin² and R Hashim³

¹Department of Basic Medical Science, Faculty of Medicine and Health Science, Universiti Sains Islam Malaysia, Kuala Lumpur; ²Microbiology Unit, Department of Pathology, Hospital Ampang, Selangor; ³Institute for Medical Research, Kuala Lumpur, Malaysia

Abstract. *Vibrio alginolyticus* is a halophilic gram-negative marine pathogen. The modes of transmission are mainly via direct contact with seawater and indirect contact through marine creatures. We report here a 28-year-old accountant diagnosed with right leg abscess after being bitten and scratched by a stray cat. *Vibrio alginolyticus* was isolated from the pus sample. The patient gave no history of contact with ocean water immediately before or after the cat scratch episode. The patient did apply commercial sea cucumber oil to the wound; we presume this is the cause of the *Vibrio alginolyticus* wound infection. To the best of our knowledge, this is the first reported case of *Vibrio alginolyticus* wound infection caused by commercially available sea cucumber oil.

Keywords: *Vibrio* infection, cat-bite

INTRODUCTION

Staphylococcus spp and *Streptococcus* spp are the most common causes of skin infections among healthy individuals. Unusual pathogen usually occur when the host's immune system is compromised. Infections with *Vibrio* spp are associated with exposure to seawater (Diaz and Lopez, 2015). We report a case of a leg abscess caused by a marine organism, *Vibrio alginolyticus*.

Correspondence: Dr Nurul Azmawati Mohamed, Universiti Sains Islam Malaysia, Menara B, Persiaran MPAJ, Jalan Pandan Utama, 55100 Kuala Lumpur, Malaysia.
Tel: 603 4289 2400; Fax: 603 4289 2477
E-mail: drnurul@usim.edu.my

CASE REPORT

A 28-year-old accountant presented to the Emergency Department with a 5 day history of pain and swelling of the right proximal shin after being scratched and probably bitten by a stray cat. The patient sustained multiple abrasions and puncture wounds. She immediately applied a commercial preparation of sea cucumber oil to the wounds and applied a compressive dressing. The next day she developed pain, redness and swelling of the wound. She sought treatment from a general practitioner physician who prescribed oral cloxacillin. The wound continued to swell and developed a purulent exudate.

Upon presentation, she was afebrile

and her vital signs were normal. The proximal and medial part of the right shin was erythematous, swollen and tender. There were 4 puncture wounds that were draining hemo-purulent discharge. She had normal serum glucose level and a slightly elevated white blood cell count (total white cells of $13.5 \times 10^9/l$: neutrophils 60.5%, lymphocytes 31.4%).

She was diagnosed with having a right leg abscess. Incision and drainage were performed and pus and tissue samples were sent for Gram stain and culture. The Gram stain showed gram-negative bacilli. Culture on blood agar grew pure growth of greyish, convex, small colonies that did not grow on MacConkey agar. Vitek GN gave a preliminary identification of *Haemophilus influenzae* but with a low correlation percentage. Further investigations from a reference laboratory identified the isolate as *Vibrio alginolyticus*, susceptible to tazocin, imipenem, meropenem, gentamicin, ciprofloxacin, cefotaxime, cefepime, augmentin and amikacin. She completed 12-day course of amoxicillin-clavulanate and recovering well.

DISCUSSION

Vibrio alginolyticus is a halophilic gram-negative marine pathogen (Chien *et al*, 2002). Seawater with salinities ranging from 2.8% to 3.5% is the most favourable for growth of *V. alginolyticus* and *V. parahaemolyticus* (Schets *et al*, 2011). Most reports of *V. alginolyticus* wound infections in humans are the result of exposure of cuts or abrasions to contaminated seawater. The modes of organism transmission are mainly via direct contact with seawater and indirect contact through marine creatures (Ho *et al*, 2014).

Alginate acid, extracted from seaweed has been used for wound healing since

the early 1980's, is highly absorbent, biodegradable and has been used to control wound discharge and to minimize bacterial contamination (Gilchrist, 1983). An earlier study in the United Kingdom found an association between wound infection and non-sterile homemade seaweed dressing; samples from the wound and seaweed dressing were positive for *Vibrio alginolyticus* (Reilly *et al*, 2011).

Sea cucumbers (*Apostichopus japonicus* Selenka), have long been used for food and folk medicine in Asia and the Middle East (Purcell *et al*, 2014). Sea cucumbers are believed to have important biological and pharmacological activities, including anticoagulant, anti-hypertension, anti-inflammatory, antimicrobial, antioxidant, antithrombotic, antitumor and wound healing (Bordbar *et al*, 2011). As a result, commercial sea cucumber is sold.

In Malaysia, traditional medicine uses sea cucumber extract for postnatal treatment and sea cucumber oil for healing open wounds (Purcell *et al*, 2014). An animal study found topical application of sea cucumber oil on wounds enhanced wound contraction in the initial period of wound healing (Subramaniam *et al*, 2013). In this case, the patient reported no contact with ocean water after being scratched by the cat. A possible source for contracting *Vibrio alginolyticus* was the sea cucumber oil she applied immediately after the injury. Unfortunately, a culture of the commercial sea cucumber oil was not obtained.

Sea cucumbers themselves are predisposed to stress and bacterial infection, particularly with *Vibrio* sp (Backer *et al*, 2004). *Vibrio* infections causes skin ulcerations and viscera rejection syndrome (Deng *et al*, 2009). To the best of our knowledge, there are no reports of *Vibrio alginolyticus* infections caused by exposure

to sea cucumber oil.

In conclusion, this case reveals the potential health risk of applying sea cucumber oil to wounds. Sea cucumber oil products may need to be monitored and licensed in order to maintain a hygienic product. Clinicians should be aware of the possibility of infection due to *Vibrio alginolyticus* caused by exposure to sea cucumber oil.

ACKNOWLEDGEMENTS

The authors would like to thank the Director of Health, Malaysia for permission to publish this paper.

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