INTESTINAL SHELL IMPACTIONS IN REHABILITATED HAWKSBILL TURTLES (*ERETMOCHELYS IMBRICATA*) IN THE UAE

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Introduction

The Hawksbill turtle (*Eretmochelys imbricata*) is a critically endangered[3] sea turtle listed on Appendix I of CITES. The species has a worldwide range throughout tropical and subtropical waters of the Atlantic, Indian and Pacific Oceans and the Persian Gulf. Worldwide population declines are a result of overexploitation of adult females and eggs at nesting beaches, degradation of nesting and foraging habitats, slaughter of adults and juveniles for meat and shells and mortality relating to entanglement, pollution and ingestion of foreign material.

The Dubai Turtle Rehabilitation Project (DTRP) is a collaboration of the Dubai Wildlife Protection Office and the Jumeirah Group, initiated by Kevin Hyland of the Dubai Wildlife Protection Office in 2005. The project receives approximately 100 sick and injured marine turtles each year, mainly comprising Hawksbill turtles and Green turtles (*Chelonia mydas*). They are accommodated in quarantine tanks at the Burj Al Arab Aquarium during initial assessment and treatment and subsequently in a 'soft release' enclosure at the neighbouring Mina A' Salam hotel prior to release.

Case presentation and investigation

In May 2010 four Hawksbill turtles being housed in the Mina A' Salam enclosure in preparation for release were found to be positively buoyant and anorexic. They were presented to the Dubai Falcon Hospital for investigation.

Haematological and biochemical evaluation were performed on all four turtles, with blood collected from the dorsal cervical sinus. Results are shown in Tables 1 and 2 on the online version of this paper. All turtles had an increased white blood cell count with mildly increased globulin level consistent with chronic inflammation and/or infection. Total protein, albumin and urea levels were mildly increased reflecting dehydration. Mild hyperglycaemia was thought to be a stress response. Dorsoventral and craniocaudal radiographs (Fig 1 and Fig 2) were take revealing distended loops of intestine containing radio-opaque material consistent with ingested shells. One turtle was anaesthetised with 80µg/kg medetomidine and 15mg/kg ketamine IM for coelioscopic examination which revealed severe coelomitis with fibrinous material adherent to serosal surfaces.

Fig 1. Hawksbill turtle positioned for xray

Treatment

All four turtles were treated with ceftazidime (Fortum, GlaxoSmithKline) 20mg/kg q72 hours by intramuscular injection, liquid paraffin 3ml per kg per os once daily and oral rehydration with pedialyte once daily. Unfortunately the turtles died within 10 days of presentation despite treatment. Post mortem of all four cases revealed intestinal impaction with ingested shell material with secondary intestinal necrosis and varying degrees of coelomitis. Culture of the coelomic cavity or pericardical sac revealed profuse growths of *Aeromonas salmonicida salmonicida* in 3 cases and *Pseudomonas aeruginosa* in the fourth. Examination of the shells recovered at post mortem identified the snails as *Mitrella blanda* and *Cerithium scabridum* species, which occur in sandy shores (Feuhlner, personal communication).

Fig 2. Xray of hawksbill turtle with intestinal shell impaction.

Discussion

The most common causes of excessive positive buoyancy in seaturtles are escape of air from the lungs secondary to trauma and the build up of gas inside the intestines secondary to ileus or obstruction.[6] In these cases radiography indicated the cause of clinical signs to be intestinal impaction with what appeared to be ingested shell material. The four turtles had all been through the initial rehabilitation process, been declared clinically healthy and were awaiting release. The onset of clinical signs occurred several weeks after movement to the soft release enclosure and coincided with a large increase in the population of marine gastropods in the enclosure following a spring bloom of caulerpa algae.

Hawksbill turtles are omnivorous, with a diet consisting of algae, sea sponges, crustaceans and jellyfish.[1] Although they will commonly predate snails in the wild they are not thought to consume them in large quantities. It is unclear why they did so in these cases: it may have been opportunistic as the snails were freely available or accidental ingestion when grazing on the algae. It is also possible there may have be an underlying calcium deficiency which the turtles were trying to correct as shells are formed of calcium carbonate and therefore provide a rich supply of calcium. *Aeromonas salmonicida salmonicida and Pseudomonas aeruginosa* have been documented in several marine turtle species1 and were considered opportunistic invaders in these cases.

Successful medical management of gastrointestinal foreign material has been documented in Hawksbill turtles[4] and is considered preferable to surgical management due to a high morbidity associated with surgery. In Loggerhead turtles (*Caretta caretta*) survival after surgical management of intestinal shell impactions has been poor due to concurrent debilitation.[5] Medical management was therefore pursued. In the future consideration may be given to surgical management following initial stabilisation however given the poor prognosis prevention is vital.

Shell impactions have not occurred in the Mina A' Salam enclosure since this event, however snail numbers have since reduced significantly. We recommend close monitoring of enclosures for the presence of gastropods, especially in association with algal blooms. Biological control of snails is a future option should numbers be seen to increase.

A full version of this paper with the Tables, Acknowledgements and References may be accessed on the WME News website.

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