

Chelonitoxism: New case reports in French Polynesia and review of the literature

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Abstract

Eating the flesh of some marine turtles can cause a type of seafood poisoning called chelonitoxism. The purpose of this article is to report a new case of mass poisoning caused by consumption of sea turtle flesh in French Polynesia. The episode involved 19 members of the same family. Three persons required hospitalization after consuming two consecutive meals including turtle flesh. One 26-year-old woman who was pregnant at 14 weeks of amenorrhea lapsed into a coma and died due to multiorgan failure on the third day after the meal. This case confirms the potential severity of chelonitoxism as reported in several series in the literature showing high mortality rates. The causative toxins are currently unidentified. Further study is needed to better understand chelonitoxism.

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1. Introduction

Chelonitoxism is an uncommon type of food poisoning caused by eating the flesh of marine turtles (Brodin, 1992). In the literature two species have been clearly implicated in sea turtle poisoning, i.e. the Hawksbill Turtle (*Eretmochelys imbricata*) and the Green Sea Turtle (*Chelonia mydas*). However, other species may be toxic including the Leatherback Turtle (*Dermochelys coriacea*) and the Loggerhead Turtle (*Caretta caretta*). Sea turtle poisoning is a severe intoxication with a high

mortality rate. It is mainly observed in the Indo-Pacific region but has also been reported in the intertropical zone where the offending species live. The purpose of this report is to describe a new case of mass turtle poisoning episode observed in French Polynesia.

2. Case report

In October 2002, 19 members of a Polynesian family ate turtle flesh during a traditional meal in Rangiroa in the Tuamotu Islands (located 350 km northeast of Tahiti in French Polynesia). The turtle that had been caught the preceding day was identified by several villagers as a young specimen of a species considered as edible by the local

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population, i.e. the Green Sea Turtle (*C. mydas*). In accordance with local customs, the turtle flesh was thoroughly cooked. Within 3 h after the meal, all people that ate the turtle flesh presented digestive symptoms with nausea and vomiting. The next day despite signs, three persons decided to eat the leftover turtle flesh because it was considered as a great delicacy. After consuming even larger quantities than the day before, all three developed severe symptoms and required medical evacuation to the Papeete Hospital in Tahiti.

One patient was a 40-year-old man with a history of gout. He presented vomiting, abdominal pain and polyarthralgia that was attributed to gout. He was admitted to the Rheumatology department and treated with analgesics. His condition improved quickly with disappearance of all clinical signs in less than 12 h.

The second patient was a 64-year-old man with a highly significant medical history including arterial hypertension, hypertrophic heart disease, previous stroke, and non-insulin-dependent diabetes. He was admitted to the critical care unit of the Renal department after exhibiting moderate functional renal failure associated with neurological signs (flaccid tetraparesis and coma) and abnormal laboratory findings (moderate liver cytolysis, hypoglycemia and pancreatic disturbances). Renal insufficiency and neurological signs resolved spontaneously within a few hours. Following resolution CT-scan was performed revealing the presence of lacunar lesions suggesting previous ischemic infarcts but no evidence of recent lesions was found. Upon awakening the patient reported upper digestive tract pain. Oeso-gastro-duodenal fibroscopy was undertaken on D1 demonstrating involvement of the whole zone with grade III oesophagitis, erosive antral gastritis and ulcerative bulbo-duodenitis that was treated using proton pump inhibitors. Gastro-intestinal signs disappeared within 2 days and the patient returned home to the Tuamotu Islands.

The third patient was a 26-year-old woman who was pregnant at 14 weeks amenorrhea but had no medical history. After consuming the turtle flesh for the second time, she quickly developed severe gastrointestinal signs requiring hospitalization in Papeete. Upon admission abdominal ultrasound was carried out to rule out the possibility of extra-uterine pregnancy. Upon clinical examination the patient already presented progressing neurological manifestations, i.e. alternating periods of drowsiness interrupted by periods of agitation. The patient

soon lapsed into a coma with bilateral constricted pupils reacting to lights and reduced tendon reflexes with no evidence of meningeal involvement. Mild increase in respiratory frequency was also observed. Other clinical findings were normal, i.e. normal cardiopulmonary sounds, soft abdomen, stable hemodynamic status without vasoactive drugs and normal diuresis. Laboratory testing demonstrated extensive abnormalities including severe metabolic acidosis, rhabdomyolysis, hyponatremia, low prothrombin rate (68%), hyperammonemia, hypoglycemia that was unaffected by intravenous glucose/electrolyte solution and elevated reactive protein C level. Findings of lumbar puncture, electrocardiography, toxic and renal assessment and thoracic radiography were normal. After the patient went into a coma on D1, her respiratory status deteriorated rapidly requiring intubation for ventilatory assistance and multiorgan failure appeared with liver cytolysis and agranulocytosis. A second ultrasound examination on D2 revealed a dead fetus in the process of expulsion. The patient's renal function deteriorated suddenly on D3 (creatinine clearance, 10 ml/min) and cardiovascular failure occurred requiring infusion of macromolecule solution and treatment with vasoactive drugs. Despite intensive care the patient died of shock associated with uncontrollable lactic acidosis, hypocalcemia and hypoglycemia.

The death of this young patient triggered an investigation by the French police who seized the shell of the sea turtle as evidence. The shell was given to expert zoologists for identification. Findings determined that the villagers had been mistaken and that the specimen was a Hawksbill Turtle (*E. imbricata*).

3. Discussion

Chelonitoxism is rare in comparison with other types of seafood poisonings such as ciguatera or scombrototoxicity that have been more extensively described (Brodin, 1992; Isbister and Kiernan, 2005). The low frequency of chelonitoxism is probably related to the fact that sea turtles are an endangered species protected by international regulations and subject to a number of religious restrictions (taboo species for many ethnic groups) (Champetier de Ribes et al., 1998). Nevertheless episodes of turtle poisoning have been reported among low-income coastal populations for whom a captured sea turtle can represent a non-negligible

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