



4º CONGRESSO LATINO-AMERICANO DE REABILITAÇÃO DE FAUNA MARINHA

DE 03 A 06 DE SETEMBRO - FLORIANÓPOLIS - SC - BRASIL 

LIVRO DE RESUMOS

MULTIDRUG RESISTANT BACTERIA ISOLATED FROM SEPTIC ARTHRITIS IN A GREEN TURTLE (*CHELONIA MYDAS*) WITH FIBROPAPILLOMATOSIS

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Introduction

Bacteria seem to play an important role in sea turtle diseases, both as primary pathogens and as opportunistic agents, infecting an injured or immunocompromised host (Alfaro, 2008). This is particularly true for animals afflicted with fibropapillomatosis (FP), a debilitating neoplastic disease that affects especially green turtles (*Chelonia mydas*). Apparently, animals afflicted with this disease become immunosuppressed with increasing severity of the tumors (Work *et al.*, 2003).

Multiresistant bacteria have become a major global public health concern and effective mitigation measures require a better understanding of the root causes of this problem. Bacterial antibiotic resistance can emerge in humans, animals or the environment, and it is usually related to excessive and inappropriate use of antibiotics (Al-Bahry, 1999).

The marine environment can become contaminated from various sources, including urban runoff and effluent discharges. According to literature, green turtles are considered good bio-indicators for environmental health due to their many particularities. With a long life-span and high site fidelity to coastal foraging grounds, this species is especially susceptible to long-term anthropogenic impacts and serve as primary hosts for multiresistant bacteria originating mainly from urban runoff (Al-Bahry *et al.*, 2011).

This study aims to report a clinical case of an FP afflicted juvenile green turtle, diagnosed with wrist septic arthritis caused by multidrug resistant bacteria.

Material and Methods

On 11 April 2016, a juvenile green turtle (*C. mydas*) with fibropapillomatosis was admitted at the rehabilitation facilities of Projeto Tamar-Ubatuba, after being incidentally captured in a floating weir, in Camburi beach, Ubatuba, São Paulo, Brazil. On admission, the animal measured 58.5 cm of curved carapace length and weighed 27 kg. It exhibited signs of mild dehydration, anemia, buoyancy disorders and bilateral swelling and tenderness in both radiocarpal joints.

In order to diagnose and treat the condition, blood and synovial fluid were cultured, using sterile 5 ml syringes and 21-gauge needles after disinfecting the skin with 70% isopropyl alcohol, followed by 2% chlorhexidine. Direct smears were also made from part of the synovial fluid, being rapidly air-dried. All samples were sent to Laborlife®, a private laboratory, in Rio de Janeiro. Additionally, dorsoplantar projections of both wrists were obtained to assess bone morphology.

At that time, the turtle was treated empirically with injectable ceftazidime (20 mg/kg each 72 hours) for 15 days, tramadol chlorhydrate (3 mg/kg each 12 hours) and Flunixin meglumine (0,2 mg/kg SID for 5 days).

The microbiology tests were performed and interpreted according to the guidelines of Clinical Laboratory Standards Institute (CLSI). Samples were cultured onto an FDA-approved chromogenic agar medium, which allows the detection of *S. aureus* with a high degree of sensitivity and specificity. Then, a rapid latex agglutination assay, for the detection of PBP2 was used, as an aid to identify methicillin-resistant *S. aureus* (MRSA). The other isolated strains were identified based on colonial appearance and the results from standard laboratory tests, which

were Gram stain, catalase, and oxidase. Antibigrams were determined by the disk diffusion method on Mueller-Hinton agar, using cefoxitin disc. Agar plates were then incubated for 24 hours at 35°C.

Results and Discussions

Culture results revealed resistant strains of *Escherichia coli*, *Morganella morganii* and Methicillin-Resistant *S. aureus* (MRSA). These microorganisms were found to be multidrug-resistant and showed high resistance to antibiotics commonly used for sea turtles, such as 3rd generation cephalosporins and fluoroquinolones. Direct microscopic examination of the synovial fluid revealed an abundant amount of necrotic material with scarce cellularity, comprising of typical squamous cells, foamy macrophages, lymphocytes and heterophils. The fluid cytology was negative for malignant neoplasm.

Wrists radiographs showed soft tissue swelling, osteopenia, with areas of bone lysis and pathological fractures, indicating severe joint and bone destruction. Previous antibiotics were replaced by vancomycin (15 mg/kg BID) and amikacin (5 mg/kg each 48 hours). However, death occurred a few days later and necropsy revealed severe generalized coelomitis.

Septic arthritis is an uncommon synovial infection in sea turtles, with few cases having been reported in literature. The condition is usually caused by microorganisms that spread through the blood stream from other part of the body or an infection from an open wound.

Methicillin-resistant *Staphylococcus aureus* (MRSA) is emerging as an important cause of illness and death in animals and has been found in different species. However, to date, only two studies have reported the isolation of MRSA from marine animals, and they were all mammals (Faires *et al.*, 2009). The other two pathogens (*E. coli*, *M. morganii*) are members of Enterobacteriales family, which are known to cause opportunistic infections in humans and animals (Shamim Ahasan *et al.*, 2017).

The presence of such pathogens is probably related to ocean pollution, which mainly originates from urban runoff and effluent discharges. The problem has been aggravated by the indiscriminate use of antibiotics. Antimicrobial resistance remains a serious global health concern, and solutions to address this fact are urgently required.

Acknowledgments

The authors thank Plasma Laboratory for isolating and identifying the bacterial strains.

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