

# Rounds

Animal Health  
Department

Medical Rounds

"medicine for all"



Caring for Stranded Marine Animals

NATIONAL  
MARINE  
L I F E  
CENTER

# Notes

Veterinary Research  
Department

Under the microscope

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Rounds Notes is a report on the health of animals at the National Marine Life Center from Sea Rogers Williams VMD for the staff, volunteers, and community of the center including professionals involved the captive care of similar species, the views expressed are not necessarily that of NMLC. Information in Rounds Notes should be considered confidential and used solely to benefit the health of aquatic animals everywhere.

July 8, 2010

Rounds Notes

9: 26- 28(2010)

## Headlines News: Hyperkeratosis vs Hypercarrotoesis

### Catch 22's initial biopsy results come back

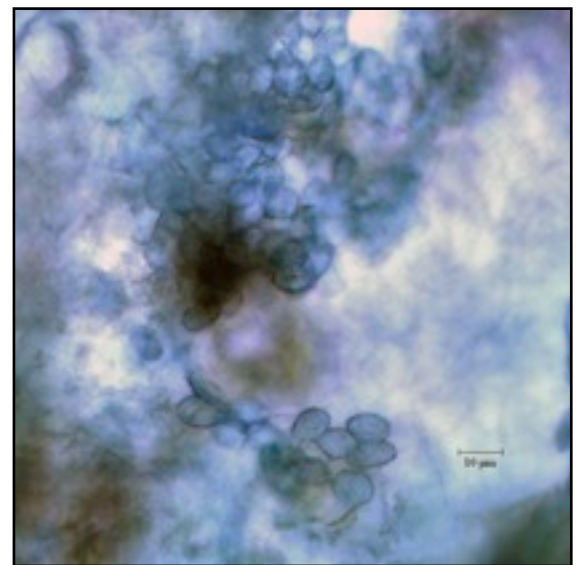
**Hyperkeratosis** is thickening of the [stratum corneum](#), often associated with a qualitative abnormality of the keratin, and may be caused by [Vitamin A deficiency](#) or infection.

**Hyper-carrot-toesis** is a spastic foot digit discolored to look like an orange root vegetable, and is purely fictional.

Catch-22 has the former, hyperkeratosis. The surface of the keratin of the shell are colonized by small spherical yeasts or algae, and fungal stain (GMS) identified large numbers of invasive fungal organisms in areas of keratin degeneration. The fungal elements are slender, septate and branching and resemble *Fusarium* or *Mucor*. The culture results are not back yet. Our suspicions of an invasive fungal shell disease are confirmed. Topical terbinafine 1% (aka Lamisil the killer of Digger the Dermatophyte) has been applied for a week now and these infections are notoriously slow to heal. The best course of therapy is to provide optimal husbandry, identify the fungus and test it against several anti-fungal agents to determine susceptibility, also a notoriously long process. We do not have a definitive etiology but my bet is on the invasive slender fungi and not the superficial colonies but we still have more to learn.

We are waiting so see how the lab does with our sample and I have requested re-cuts of the histopathology and stains so we can all see what's going on.

Meanwhile, we will continue to monitor the shell for progression, continue the topical therapy and access to basking, and consider systemic therapy if necessary.



## Up on a Soap Box “Shell Rot”

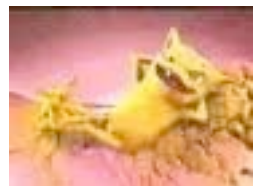
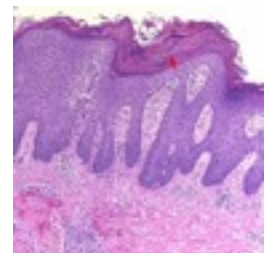
would a rot by any other name, smell as sweet

We were asked if Catch-22 had “shell rot”, presumably they knew of this disease and it’s treatment, a simple matter, use this and all will be well. My answer is . . . ‘surrre’ but I prefer to avoid the term altogether, for one it’s so unhelpful. Many hobbyists and pet suppliers are quick to make a diagnosis, look at the shell, a case of ‘shell rot’ they say ‘some are bad but some get better’ is the usual reply. Not much more help there. This is followed by a series of recommended creams, salves, and medications all of which they have in stock. This amounts to ‘shot-gun’ therapy and is about as accurate. Not to say shotguns aren't effective and many instances they get the job done, but there is a better way. The hobby is full of these quazi medical terms, “shell rot” “fin rot” “dropsy”, they are poorly descriptive syndromes at best and lead to neither an accurate diagnosis nor prognosis and do not effectively guide therapy. At least they give a location, the shell, and with Catch-22 both the carapace and the plastron are involved so we have shell disease. Most shell diseases are related to poor water quality and husbandry practices and thus improvements in this area are always warranted and may get many minor problems to resolve. Husbandry and nutrition are somewhat species specific, in this case clean water, access to UV-B, a basking area, a drop of cod liver oil on the food (for vitamin A), dark leaf lettuce, and Repomin® sticks are a good start. Keep the temperature in the high 80’s, a little warmer when fighting an infection.

So what causes cases of “shell rot” since they appear to be so common, and how is the veterinary approach different? Many, many things. For those cases where infections play a significant role they are typically caused by fungi and occasionally bacteria, most of which are opportunistic pathogens and get their foothold due to poor water quality, shell trauma, and/or host compromise by diet and husbandry conditions. Veterinarians used the time honored approaches of biopsy and culture, and understand the limitations of each. To assist the turtle in healing, targeted therapy can be of great benefit if the pathogen can be isolated, identified, and tested for resistance. While this is not always possible the more we know the better off we are. An understanding of the state of health of the turtle is also paramount to getting a grasp on these infections and frequent physical assessments combined with complete blood counts and serum chemistry profiles and radiographs allow us to interpret the overall health status of the patient.

So what does Catch-22 have ?

I would diagnosis this turtle with **Fungal Hyperkeratosis of the Shell**. The infection can be likened to human nail bed infections (see side bar). The lesions are restricted to the keratin layers, i.e. superficial, so fix the outside namely the environment and apply topical therapy. The presence fungal elements are guiding therapy (terbinafine) and give us a perspective on the cause and likely duration of the condition, slow to progress and slow to heal. It also allows us to weigh the options of more aggressive systemic therapy with greater risks to the liver as well as added expense. We are a long way from being done or from a definitive diagnosis, so stay tuned for further updates.



## Clinical Update: Patty

### continues to do well, blood supply increasing to pseudoshell

The large blistered areas of the pseudoshell have sloughed away, and this is likely part of the healing process, that connective tissue was dead and had to go, and blood brings the essence of life itself, so a little hyperemia to the area could be a good sign. We are still giving the betadyne soaks and using SSD topically as we monitor for signs of infection. Patty is eating well in the brackish feeding bin and this has helped maintain water quality, and she is a little less edematous.



## Under the Microscope

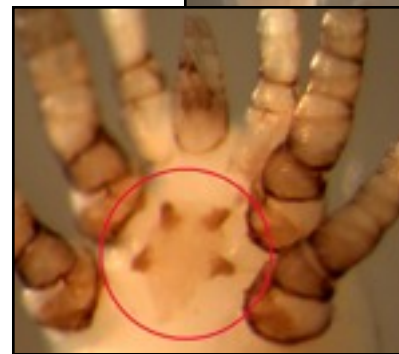
### more humpback kidney problems and nasal mites

Cases have recently been submitted from the University of New England (UNE), MARC and the New England Aquarium (NEAq) MAR.

First was the fragments of a kidney parasites from a well decomposed humpback whale from Martha's Vineyard. While the diagnostic parts of the worm were not submitted due to the poor quality of the whale at the time of necropsy, the relatively small size of the worm given the host and location make it likely to be *Crassicauda crassicauda*. The NEAq team and Dr. Michael Moore were able to find some gear entangled around the remains of the whale, so it's unlikely the parasite played a significant role in the animal's death.

UNE submitted a lung worm from a seal which I am still examining, and some very interesting nasal mites. I believe the occurrence of these mites (*Halarachne halichoeri*) in harbor seals are much more common than we realize, even if the literature is quiet on their presence, and severe disease in gray seals, where the mites are well known, has been reported. There is even one case of zoonotic transmission of seal nasal mites causing human ocular disease but this deserves further investigation, as the report is a secondary source at best, and I remain a little skeptical. However, I do not plan on standing in front of any sneezing seals without a full face shield. I also reviewed a report of trans-rectal selamectin used to treat some sea otters with a similar mite infestation (*H. miroungae*), but this too is something I'd rather not experience, from either end, so to speak.

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