There is something very rewarding about lancing a large abscess and watching the pus ooze out! But the same cannot be said for abscesses in reptiles. Our ectothermic patients just have to do things a little differently...

An abscess is defined as a localised collection of purulent material (pus) in a confined cavity formed by the disintegration of tissues. While they are seen in all species they are a particularly common condition diagnosed in reptiles.

Mammalian pus is most often liquefied and composed of degenerate or toxic neutrophils, macrophages, lymphocytes, bacteria and necrotic tissue debris.

In contrast the contents of reptilian abscesses are usually not liquefied. They tend to be caseous with the consistency of firm cheese surrounded by a thick capsule. When cut open they often have a lamellar appearance similar to that of an onion.

But why are reptile abscesses so different to those in mammals? It all comes down to their unique inflammatory system. Mammalian neutrophils contain a potent oxidative pathway that allows them to phagocytose and digest bacteria. Once attracted to the site of infection the neutrophils go to work engulfing the bacteria and neutralising them. This inflammatory process results in a “soup” of degenerate neutrophils, bacteria and tissue debris being formed.

In reptiles the presence of infective material in the tissues elicits an inflammatory response that results in fibrin being exuded into the area. If the inciting pathogen gets incorporated into this fibrin network a chronic process develops with more and more fibrin being laid down. This process has led to abscesses in reptiles often being referred to as “fibriscesses”.

In addition to this fibrinous reaction the reptilian equivalent of the neutrophil, the heterophil, does not contain an oxidative killing mechanism. These two facts combine to result in reptile pus taking on its solid nature.

The diagnosis of an abscess in a reptile can actually be challenging in some cases. Clinical signs are dependent on the organ or organs involved. Swellings may be obvious but not always obvious if the abscess is located within the body cavity. Pain when palpated is not always present. Affected animals may not show any laboratory evidence of problem such as an elevation in the white blood cell count. Aspiration of the suspected abscess may also be unrewarding because of the solid nature of the pus, as few to any cells of diagnostic significance may be recovered. Culture of abscess may be negative in many cases. Samples should be taken from the inner lining of the fibrinous capsule and not the centre of the abscess. This is because the central area has often outgrown any blood supply and rarely produces positive culture results.
A number of different bacteria have been isolated from reptilian abscesses. The majority of these are Gram-negative species including *Pseudomonas, Enterbacter, E. coli,* and *Salmonella*. Gram positive isolates have included *Staphylococcus* and *Streptococcus*. Anaerobic bacteria such as *Bacteroides, Clostridium* and *Fusobacterium* have also been cultured.

The consequence of having solid pus is that lancing and/or providing systemic antibiotics will not result in a cure. Treatment of reptilian abscesses requires surgical excision, particularly of the surrounding fibrous capsule. Once the abscess capsule is removed the wound is often left open to heal by secondary intention and granulation.

Best medicine suggests that all abscesses should be cultured and antibiotic selection be based on sensitivity testing. It should be remembered that antibiotics vary in their ability to penetrate abscesses or work in acidic or anaerobic conditions. For this reason enrofloxacin, one of the most commonly used antibiotics used in exotic animal practice, is generally ineffective in the treatment of reptilian abscesses.

Case studies of reptile abscesses...

**Case #1**

A male Eastern Long-necked Turtle (*Chelodina longicollis*) of unknown age and weighing 513 grams presented with a 5mm swelling on the right side of the head just cranial to the tympanic membrane. It had developed over a period of 1 to 2 months. The turtle had shown no ill effects from the swelling and continued to feed and behave normally. On examination a small hole was located in the corner of the mouth on the right side and upon probing was found to open up into the swelling cavity. A small amount of solid purulent material was able to be removed through the hole.

The turtle was induced with alphaxalone (Alfaxan-CD RTU®, 10 mg/ml, Jurox PTY LTD, NSW, Australia) intravenously (IV) at 4 mg/kg. An 18 gauge intravenous catheter was used as an endotracheal tube. He was maintained on 2% isoflurane (Isorrane, Baxter Healthcare, NSW, and Australia) and artificially ventilated with a mechanical ventilator at 3 breaths per minute (http://www.vetronics.net/products/smvent.php). A Parkes Doppler probe (http://www.aasmedical.com.au/index.php?id=163) was placed over the cardiac region to monitor heart rate. The swelling was incised and the overlying skin removed to expose the abscess. The pus was removed and the internal capsule of the abscess was curetted using a dental hand scaler. The cavity was flushed with 0.05% chlorhexadine solution and then packed with silver sulfadiazine cream (Silvazine 50 gm, Smith & Nephew, Vic, Australia). A single subcutaneous (SC) injection of meloxicam (Metacam® Solution for Injection, 5 mg/ml, Boehringer Ingelheim PTY LTD, NSW, Australia) was given at a dose of 0.2 mg/kg. The turtle recovered uneventfully from the anaesthesia and was discharged from the hospital later that same day. The cavity was packed with Silvazine cream daily for 14 days. During this time the turtle was confined to a small plastic container with shredded newspaper and no water. 2 weeks post-surgery he was released back into his regular tank. 18 months later he is doing well and there has been no recurrence of the abscess.

**Case #2**

A male Spiny-tailed Monitor (*Varanus acanthurus*) of approximately 3 years of age weighing 250 grams was brought in to the hospital after developing a very swollen left hind leg over the previous 6 weeks. The owner had noticed the monitor was missing a nail from the left hind foot about 2 weeks prior to the leg beginning to swell. A 5mm incision had been made in the swollen foot by the owner
and they had removed a small amount of purulent material. The leg had continued to swell over the coming weeks and they elected to bring it in for further treatment.

The monitor was given butorphanol (Torbugesic®, 10 mg/ml, Fort Dodge Australia PTY LTD, NSW, and Australia) at 0.4 mg/kg intramuscularly (IM). Thirty minutes later he was induced with alphaxalone IV at 4 mg/kg. A 2mm uncuffed endotracheal tube was placed and secured in position. 2% isoflurane and artificial ventilation with one breath delivered every 10 seconds was provided to maintain a surgical plane of anaesthesia. A Parkes Doppler probe was placed over the cardiac region to monitor the heart rate and rhythm.

A radiograph revealed a small abnormal looking piece of bone within the foot. This was assumed to be the remains of the missing toe and the likely entry point of the infection given the radiographic appearance was consistent with osteomyelitis. The incision in the foot was extended and a moderate amount of pus was removed. The boney fragment was also located and removed. The cavity was flushed with copious amounts of 0.05% chlorhexadine and left open to heal. Wet-to-dry bandages using 0.05% chlorhexadine were used and changed daily for 8 days. The monitor received meloxicam at 0.2mg/kg SC and was sent home with oral meloxicam (Metacam® Oral Suspension, 1.5 mg/ml, Boehringer Ingelheim PTY LTD, NSW, and Australia) at the same dose to be given for 7 days. In addition the lizard was given oral metronidazole (Flagyl S Suspension 200mg/5ml, Aventis Pharma, NSW, Australia) at 20mg/kg once daily for 10 days.

After 5 weeks the wound had healed over and the foot had returned to its normal size.

Case #3

Precious was a 4-year-old female Coastal Carpet Python (Morelia spilota mcdowelli) that was seen to develop a small swelling in the ventral mouth after eating a rat approximately 6 weeks prior to being seen at Karingal Veterinary Hospital. The referring veterinarian had started the snake on SC injections of ceftazidime (Fortum 1g, GlaxoSmithKline Australia, Victoria, Australia) but the swelling had dramatically increased in size.

On examination Precious was active and in good body condition. She was not able to extend her tongue. There was a very large, firm swelling present in the mouth and pus was visible protruding out the end of the tongue sheath.

The snake was given butorphanol at 0.4 mg/kg IM. Thirty minutes later she was induced with alphaxalone IV at 4 mg/kg. A 2mm uncuffed endotracheal tube was placed and secured in position. 2% isoflurane and artificial ventilation with one breath delivered every 30 seconds was provided. The heart rate and rhythm were monitored with a Parkes Doppler probe.

An incision was made along the right side of the tongue sheath just below the tracheal opening. A large plug of pus was removed. The swab was taken from the wall of the abscess deep inside the cavity before it was flushed with 0.05% chlorhexadine. Given the location of the incision it was elected to close the cavity using a two-layer inverting pattern of 6-0 polydioxanone (PDS II™, Ethicon Inc, Johnson and Johnson, NJ, USA). She received a single SC injection of meloxicam at the time of surgery and daily for 6 days following the procedure.

The culture and sensitivity grew a heavy growth of Pseudomonas aeruginosa that was resistant to ceftazidime but sensitive to ticarcillin, enrofloxacin, gentamicin and amikacin. It was elected to begin
Precious on daily IM injections of ticarcillin (Timentin, GlaxoSmithKline Australia, Victoria, Australia) at 50mg/kg daily for 10 days.

Precious was discharged the following day and she was seen to be extending her tongue. 4 weeks after surgery the wound had healed well and there was no evidence of the abscess reforming.

**Case #4**

A 2-week-old Black-headed Python (*Aspidites melanocephalus*) was presented after developing a hard swelling throughout the caudal third of the body over an unknown period of time. It had eaten normally 5 days before presentation. A presumptive diagnosis of a yolk sac abscess was made.

A 2mm endotracheal tube was placed and intermittent positive pressure ventilation was applied using 5% isoflurane until the snake was anaesthetised. It was then maintained on 2% isoflurane with one breath being delivered every 15 seconds.

An incision was made along the left caudal side of the snake. A 12cm solid abscess was exteriorised. The capsule of the abscess was removed with careful sharp dissection. A small hole in the wall of the gut was repaired using 6-0 PDS. The coelomic cavity was flushed with warmed saline and closed with 4/0 PDS. The skin was closed with 3-0 polyamide (Daclon, SMI, Belgium). The snake was given ceftazidime SC at 20mg/kg and meloxicam SC at 0.2mg/kg.

Unfortunately the snake died overnight. It appeared that the blood supply to the caudal part of the snake had been compromised during surgery.

**References**


Huchzemeyer FW and Cooper JE 2001. Fibriscess, not abscess, resulting from localised inflammatory response to infection in reptiles and birds. Veterinary Record 147, pp 515-516