

Treating GI obstruction in an Argentine horned frog

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A two-year-old male Argentine horned frog (*Ceratophrys ornate*) – weighing 252g – presented with a one-month history of lethargy and anorexia.

The owner reported, during the three months of ownership, the frog had not passed any faeces. His care was excellent, but, according to his current owner, his previous care was suboptimal, with poorly monitored and maintained temperatures and humidity.

On clinical examination, a large, firm mass was palpable in the frog's coelomic cavity, with excessive straining noted after palpation, and it was grossly bloated. Heart rate and rhythm were assessed with Doppler ultrasonography over the apex beat, and were deemed within normal limits. Respiratory rate, integument examination and oral examination were also within normal limits. Evidence of dehydration was noted due to the presence of enophthalmia and a loss of skin elasticity during the initial clinical examination.

Supportive care

The patient was hospitalised at the species-preferred optimum range (65°F to 85°F) and regular misting with dechlorinated water was used to increase the relative humidity in the enclosure throughout the amphibian's stay. Further fluid therapy was initiated prior to *investigations*. As amphibian skin is nonkeratinised and semipermeable (Hadfield and Whitaker, 2005), the frog was rehydrated in a bath of one part saline to two parts 5% dextrose. The patient refused all food items offered prior to surgical investigation.

Diagnostic procedures



A dorsoventral view of the frog, demonstrating extensive distension of the gastrointestinal tract.

Conscious dorsoventral radiographs were performed, revealing a large amount of impacted material in the frog's stomach and intestines. Bone density was normal and no other abnormalities were detected on radiography. Optimum temperature and humidity were maintained wherever possible during the procedure. When handled, moistened, powder-free latex gloves were worn.

Surgery and treatment

In light of the radiological and clinical examination findings, a coeliotomy was performed. Analgesia was provided in the form of 50mg/kg morphine IM. Anaesthesia of the patient was induced via bathing in tricaine methanesulfonate 1g/L dechlorinated water (0.1% solution). The anaesthetic solution was buffered to a pH of 7 to 7.4, thus preventing iatrogenic metabolic acidosis (Hadfield and Whitaker, 2005). Care was taken to keep the nares and mouth out of the water to prevent drowning (Stetter, 1995). An airline connected to an oxygen pump was used to increase the oxygen partial pressure in the anaesthetic solution.

The patient was maintained in the 0.1% solution until its palpebral and righting reflexes were lost, and, subsequently, withdrawal reflexes were diminished.

Once anaesthetised, the patient was placed on a damp soft towel in dorsal recumbency. Doppler ultrasonography was placed over the apex beat to allow cardiovascular monitoring throughout

surgery and the skin prepared with sterile saline. The patient's anaesthesia was maintained throughout surgery using a combination of a 50% dilution of the original solution and dechlorinated water with a high oxygen partial pressure. Ambient temperature was kept within the species' preferred temperature zone (Hadfield and Whitaker, 2005). Clear drapes were used throughout to monitor respiration.

A coeliotomy was performed via a paramedian ventral incision, allowing adequate visualisation of the obstruction, located in the stomach and proximal duodenum, while avoiding the ventral abdominal vein. The gastrointestinal blockage was externalised, an enterotomy performed, and a large quantity of bark chips and soil milked from the stomach and intestines. A sample was retained for microscopic evaluation. The intestines were closed using 5-0 poliglecaprone 25, checked for leakage, then the coelomic cavity was flushed with the aforementioned solution of saline and 5% dextrose. The peritoneum was closed in using 4-0 poliglecaprone 25 in a simple, interrupted pattern and the skin was closed in the same manner. The suture material was chosen due to its non-absorbable nature.

Recovery



The frog's heart rate being monitored pre-surgically.

The frog was closely monitored during its recovery period, which was uneventful. The faecal sample was tested, but no endoparasites were seen. After 48 hours of hospitalisation, where the ideal temperatures and humidity were maintained, the frog was discharged with 10mg/kg enrofloxacin to be given orally (PO) once daily (SID) for seven days post-surgery, as well as seven days of 0.1mg/kg meloxicam PO SID. At discharge, the frog was being successfully force fed gut-loaded insects, which was continued at home by the owner. The frog was kept off loose substrates while the surgical site healed.

Outcome

Seventy-two hours after discharge, the frog resumed self-feeding, the owner continued to provide a variety of gut-loaded and appropriately supplemented insects, as well as the occasional pinkie mouse. Faeces were passed 20 days post-surgery.

The sutures closing the skin were removed four weeks post-surgery. The surgical site had healed well. It was recommended the frog could return to being housed on loose substrate again; however, he should be fed outside of his enclosure to prevent him eating anymore substrate during his over-keen feeding sessions.

Discussion



The frog's heart rate being monitored peri-surgically.

Gastrointestinal obstructions are a common problem seen in amphibians (Stetter, 1995). Obstructions are not always associated with clinical signs (Stetter, 1995; Hadfield and Whitaker, 2005), although when anorexia, lethargy or lack of faecal production are observed, swift diagnosis and surgical intervention are recommended (Hadfield and Whitaker, 2005).

Gastric foreign bodies are a common occurrence due to frogs' often indiscriminate feeding habits. However, these can often be easily removed with long forceps during endoscopy, without having to resort to surgery (Stetter, 1995). It is important when an amphibian is hospitalised it is maintained at its preferred optimum temperature zone. This not only ensures ideal surroundings for the amphibians, but also optimises drug absorption, metabolism, distribution and excretion (Sykes and Greenacre, 2006).

Conclusion

This case describes the surgical removal of a gastric and proximal duodenal obstruction, caused by the ingestion of unsuitable substrate while being kept at poor environmental temperature and humidity by the previous owners.

Amphibian medicine and surgery is still very much in its infancy (Chinnadurai, 2014; Stetter, 1995), but in this case, a review of the available literature aided in the complete resolution of clinical signs and the return of normal eating and living habits of the patient.

- **Some drugs mentioned have been used under the cascade.**

References

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