



Plight of the iguana: a case report

Veterinary nurse, Susan Redden, Dip AVN Surg, describes anaesthetic protocols for an iguana requiring surgical removal of an abscess

PREVIOUS RELEVANT HISTORY

The patient, an 18-month-old male iguana, was presented with a large swelling on the left side of his face, caudal to the eye. According to the owner, this was a recurring problem with the animal. On examination, a solid swelling, encased in fibrous tissue was identified. An abscess was diagnosed and surgery was scheduled.

PRE-ANAESTHETIC EXAMINATION

Pre-operatively, a full clinical examination was carried out. The patient's nares, ears and eyes were checked for any visible signs of discharge or trauma. The oral cavity was also checked for signs of stomatitis. The patient's body condition was assessed and his weight was recorded as 0.275 kg. Food was withheld for only one hour pre-operatively, as regurgitation in herbivores is rare and prolonged fasting can damage the intestinal flora of reptiles. Heart and respiration rates were recorded as 36-breaths-per-minute and 90-beats-per-minute.

PRE-OPERATIVE PREPARATIONS

The patient was placed in a vivarium with an infrared lamp and a UV light to maintain the preferred optimum temperature zone (POTZ) until induction. Antibiotic and fluid therapy consisted of 1.5 mg enrofloxacin and 3 mls compound sodium both administered subcutaneously (s/c).

PRE-MEDICATION, INDUCTION AND MAINTENANCE OF ANAESTHESIA

No sedation was administered, however, analgesia was achieved with 1.0 mg carprofen administered s/c. For induction of anaesthesia, the patient was gently restrained by grasping the pectoral girdle with one hand and restraining the upper body and head. The other hand grasped the pelvic girdle, thereby restraining the pelvic limbs. The tail was then extended and supported.

It is important to emphasise that the tail must never be grabbed, as it may shed without re-growth of the structure. The ventral tail vein was prepared by cleaning the scales with a povidone-iodine solution and a soft toothbrush. Due to the size of the patient, a 1 ml syringe with a 23 gauge needle was used to administer 2.8 mg of propofol via the tail vein. The needle was inserted at a 90-degree angle while administering the anaesthetic; 0.15 mls in total were required in order to achieve intubation. The glottis was sprayed with local anaesthetic. Several unsuccessful attempts were made to insert a 2 mm non-cuffed, endotracheal (ET) tube, and so, a size 8 fr nasogastric feeding tube was inserted instead. The tube was measured pre-insertion and, once secured, the tube was connected to a non-re-breathing Ayres T-piece. Pre-oxygenation was performed initially to help counteract possible apnoea, which is very common with these patients due to breath holding once propofol is administered. Isoflurane gaseous anaesthetic was selected to maintain anaesthesia. Isoflurane rates ranged between 1% and 3%, with O₂ flow rates remaining at 1.5 L/min throughout. Heart rate increased to 100 bpm when the abscess was being curetted, so isoflurane was increased to 3%. This lasted for approximately 10 minutes, and returned to 1% for the remainder of the procedure. The vaporiser was turned off approximately five minutes before the end of surgery and O₂ was administered via a facemask during the recovery period. In total, anaesthesia lasted 30 minutes

SURGICAL PREPARATION

The area to be incised was prepared with povidone-iodine antiseptic and draped. A final application with alcohol was avoided in this case as it would predispose the patient to heat loss and hypothermia. This occurs as reptiles have a large surface area in relation to their volume, which allows greater heat loss. The patient was positioned on the operating

table in sternal recumbancy and bubble wrap was placed around the body. In addition, a UV light was incorporated, to help maintain core body temperature. Body temperature was monitored via a rectal probe during the surgery.

POST-ANAESTHESIA CARE AND OBSERVATIONS

Immediately post-operatively, the patient was returned to his vivarium. An infra-red heat lamp, UV light and a humidity regulator were present to help control the environment. During recovery, the patient was monitored with minimal handling. After 30 minutes he started moving around the vivarium. Some fresh vegetables and water were introduced, but he showed no interest. A few hours later he had eaten some of his food and appeared more alert. His vivarium was sprayed with sterile water to provide moisture. A water bath was avoided to avoid accidental drowning during recovery. Oral antibiotics, enrofloxacin (0.06 ml in water once daily), was prescribed for six days. The patient made a slow, but full recovery.

DISCUSSION

Reptiles are ectothermic in nature. They require certain environmental temperatures in order to reach their preferred body temperature (PBT). They must acquire their PBT to function successfully. Pre-operatively, it was very important to maintain the patients' POTZ as most injectable anaesthetic agents are removed by biotransformation, and decreased temperatures reduce organ function and lead to prolonged clearance of these drugs. Pre-medication such as atropine or acepromazine can be incorporated in reptile anaesthesia, however, the former can lead to prolonged ileus and, unless the patient is very uncooperative, these drugs are generally avoided. Reptilian anatomy is very different: they have a rudimentary larynx and no epiglottis. This allows easier intubation, however, the glottis is closed at rest and time must be allowed for it to open naturally. Reptiles have no diaphragm and use their intercostals muscles for respiration. This influenced patient positioning during surgery. The bubble wrap was gently placed around the patient to avoid putting pressure against the ribcage and obstructing expansion of the thoracic cavity. In addition, reptiles can breath hold and this fact, combined with the respiratory depressive effects of propofol, necessitated O₂ being administered pre-operatively. If breath holding occurs, intermittent positive pressure ventilation (IPPV) is required. Extreme care needs to be taken not to overinflate the lungs during this process.

Although anaesthesia was maintained via a nasogastric tube, it would have been more appropriate to use a larger diameter ET tube. This would have decreased operating room waste gas pollution and allowed IPP V, if required. Propofol was chosen as it is rapidly metabolised, with minimal organ metabolism and is non-cumulative. Propofol was infused very slowly to avoid apnoea and reduce its cardiopulmonary depressive effects. Spontaneous recovery usually occurs within 20-30 minutes post operatively. Ketamine was avoided as it has the major disadvantage of a prolonged recovery period. Also, it is administered

intramuscularly and results in a painful injection site. It is excreted via the kidneys and the renal portal system in reptiles is different to that of mammals. Drugs must be administered in the cranial half of the body as blood from the caudal half flows to the kidneys before the heart and may be excreted before they can work. Ketamine can be combined successfully with medetomidine, providing good anaesthesia and a quick recovery, due to the reversal agent antipamezole.

Isoflurane was chosen as it is minimally metabolised by the body (0.3%) and excreted by the lungs, whereas, halothane is largely metabolised by the liver (15-20%). It has a lower blood gas partition coefficient and fat solubility than halothane, leading to a quicker recovery. It has good muscle relaxation and some analgesic properties, while halothane has to be combined with nitrous oxide to achieve analgesic benefits. Nitrous oxide combined with one of the above agents can be used successfully, however, it decreases inspired O₂ concentrations and tends to accumulate in gas-filled spaces within the body. The use of sevoflurane has also been documented and it demonstrates similar properties to isoflurane when used in reptile anaesthesia.

During anaesthesia, only minimal monitoring equipment was available. Due to the thickness of the scales of lizards and the reduced clarity of their three-chambered heart, an oesophageal stethoscope was employed to monitor heart and respiratory rates. The pedal reflex, head withdrawal, and tail pinch responses were incorporated to assess the plane of anaesthesia. These reflexes diminish when a surgical plane of anaesthesia is achieved. The palpebral reflex is not so useful in lizards, as the eyelids close during anaesthesia. Reptiles are difficult to monitor and additional equipment such as a respiratory flow meter, ECG, pulse oximeters or Doppler probe would all have been beneficial in this case.

Post-operatively, great care was taken to avoid any rapid movements, which could cause orthostatic hypotension. This is a pooling of blood, which can lead to a decrease in venous return and cardiac output. The patient was returned to his vivarium in a quiet recovery area. The POTZ was maintained at 30°C and care was taken not to overheat the patient as this could lead to the metabolic rate increasing, but not the respiratory rate correspondingly. The patient was continuously monitored for signs of pain, such as aggression, immobility or decreased appetite.

In conclusion, surgery and anaesthesia of reptiles presents many additional challenges and special consideration must be given both pre- and post-operatively to address the particular requirements of these patients.

REFERENCES

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