Exotics Club

Reproductive Diseases In Tortoises

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Tortoise reproduction 2013

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Reproductive disease

Reproductive disease is a common clinical presentation, in males diseases are usually limited to cloacal organ prolapse and normal sexual behaviour and territoriality which may be directed to the owner, another tortoise or an object. In females this falls into two main categories with a collection of different secondary complications. Firstly pre ovulatory diseases and secondly post ovulatory diseases. To understand these diseases a basic outline of the normal reproductive cycle needs to be understood.

All chelonians lay eggs. When females become sexually mature (which is a factor of size not age per se) they start to develop ovarian activity and produce follicles on their ovaries (right and left). These ovaries are very long and consist of a chain of primordal follices.These follicles develop under the influence of oestorgen to vittellogenic follices. Lipid is produced by the liver and subsequently incorporated into the follice. Overall control of this system is by gonadotrophins. Development is influenced by photoperiod, light intensity and temperature. Other potential factors include the presence of a male, which has implications for their captive care.Ovulation leads to the production of progesterone which inhibits further ovulation. The follices then develop in the oviducts to form shelled eggs. Eggs are laid during the summer season in the UK when the weather is sufficiently warm. Typically conditions have to be right to induce egg laying. This includes a suitable nesting site, temperature and humidity. Many female chelonians can go thorugh this cycle undetected by their owner. However carrying large numbers of follices and eggs typically induces anorexia and this may be a sign noted by the owner and be the sole reason for presentation.

Common female reproductive diseases

Follicular stasis typically becomes evident later in life and can be seen in isolated females.It is typically associated with hepatic lipidosis, prolonged anorexia and may simply present as a non specifici illness. These females can be in a variable state of metabolic crisis. It may be these females lack the specific cues to ovulate successfully and are unable to resorb follicles effectively. The diagnosis rests not only on the identification of mature follices but also the length of time that mature follices are present on the ovaries. As a result these cases can present at any time of the year.

Egg binding can occur due to a variety of underlying causes ranging from a lack of a suitable nesting site, poorly calcified eggs, prolonged retention, through to genuine dystocia due to malformed eggs,obstruction due to an abnormally shaped pelvis or a urolith for example. Animals that are staining can induce a cloacal or oviductal prolapse which typically presents as an emergency case. Owners also report these females to be restless and they show digging motions with their back legs and may have dug trial nests if given the opertunity.

Diagnosis

Given the likelihood of underlying metabolic complications a thorough work up is indicated for most cases which includes a thorough clinical history and examination. Female tortoises require a ten fold increase in the calcium levels in the diet to deal with the extra demands and most owners are not supplementing sufficently.

Clinical examination can reveal a female that appears to weigh heavy based on previous records and the fact it has been anorexic.

Bloodwork is a good starting point and a variety of biochemical changes can suggest reproductive activity. Blood can be taken from the jugular veins. This runs on either side of the neck (the right is larger)

from the tympanum coursing dorsally. The carotid artery can also be sampled and runs more ventrally. They are both superficial vessels. Care has to be taken as haematomas are common particularly if the carotid vessels are inadvertently punctured. Skin disinfection should be thorough prior to venipuncture. 25 gauge needles will be required in most cases. Other sites include the subcarapacial sinus which is a confluence of the common intercostals veins and the dorsal branch of the jugular veins. Lymph dilution is possible at this site but usually has minimal effect on results with careful technique. The lymph vessels lie directly over the sinus site and so some contamination is inevitable. However there is the possibility of spinal damage in this location and a cautious approach is needed. This vessel can be accessed with the head in or out and a longer 1" or 1.5" needle required in larger tortoises. The dorsal tail vein leads to marked lymph dilution and should not be used for blood sampling. Ionised calcium should be measured alongside total calcium, proteins and uric acid levels as a minimum. Many females may be reproductively active and elevated total calcium levels can mask genuine deficiencies.Total calcium is typically elevated due to an increase in total protein and albumin levels. Ionised calcium levels can be increased, within reference ranges or reduced below normal. Tortoises can have suprisingly low ionised calcium levels with minimal clinical signs being evident. Concurrent hepatic lipidosis will be present but biochemical changes may be minimal.

The diagnosis rests essentially on identifying if eggs or follices are present. Dorsoventral radiographs are suitable to identify eggs. It is important to look closely in case there are poorly calcified eggs present and to evaluate the pelvcis to evaluate if the eggs are relatively oversized. Occasionally an egg will become lodged in the pelvis or fall into the bladder cranially and these can be easily identified due to their midline location. Eggs retained in the bladder for a long time can become roughened due to the deposition of urates. It can be difficult differentiating between normal gravidity and disease. Many females may just lack the appropriate physiological and behavioural cues to lay eggs. Isolated female chelonians may require social cues from males (pheromones or physical interaction) to induce ovulation. Females that have eggs to lay are quite fickle about where they lay their eggs. A familiar environment, the correct temperature and humidity and a suitable area to lay eggs are required. Nutrition is important, producing eggs requires high levels of protein and calcium and marginal husbandry can have a greater effect on reproductively active females.

Follicles will not be evident on radiography and in these cases ultrasound via the pre femoral fossa will yield a diagnosis. A 8 – 15 mhz probe with a small footprint is required. The prefemoral fossa is cleaned and filled with ultrasound gel. The tortoise is then held with the fossa of interest downwards. The leg is held and retracted caudally. The bladder should be readily identified and is fluid filled with some solid urates. Directly behnind this the follicels should be evident as soft tissue density spheres. These can be measured and counted. Those animals with follicular stasis will have large numbers (70 plus) fo follicles over 1 cm in diameter present.

Endoscopy can be used to aid the diagnosis of follicular stasis. This can be performed via the pre femoral fossa under anaesthesia. However given the simplicity of ultrasound and the non invasive nature endoscopic examination is probably uncessacary unless other diseases are suspected, for example hepatic disease. However cases of follicular stasis are surgical and the liver could be evaluated at that point and biopsies taken. Endoscopy of the cloaca is also possible and may identify retained eggs in the pelvis or bladder.

Treatment

If shelled eggs are present in the expected location on the radiographs and there is no obvious reason for the stasis (i.e. its behavioural not pathological) then changing the environment at home may lead to egg laying. The tortoise is usually exposed to a suitable nesting site and observed oral calcium and nutritional supplements can be provided where practical.

If there are no eggs passed then premedication with atenolol at 7mg/kg PO and calcium gluconate 100mg/kg by injection every six hours (ideally based on blood ionised calcium levels) followed by oxytocin at 2- 10 IU/kg can lead to oviposition. If the correct case is chosen oxytocin works well.If this is not successful then a surgical approach is required. If there are no shelled ova present then surgery is required.

Cases of follicular stasis have been treated medically but the results so far are equivocal. Improvement in the overall care of the chelonian is important and some clinicians advocate exposing the female to a male to induce ovulation. Hormone therapies tried include the use of proligestone (20 mg/kg) by injection and deslorelin implantation as it is the oestrogen that is responsible for maintaining the follicles. Most cases end up being surgical.

Generally a ventral plastronotomy is the preferred surgical approach but soft tissue approaches have been described. Access is more limited in the common species seen in the UK due to the anatomical limitiations of the pre femoral fossa.

It is possible to exteriorise both ovaries and hand tie the vessels. The oviducts should be removed if any pathology is suspected. The distal end at the cloaca should be oversewn to avoid any reflux. If eggs are removed but the oviducts left in place then the oviducts should be sutured with an inverting suture. If the oviducts are removed it is important to remove the ovaries as well to avoid a yolk coelomitis.

Treatment includes placement of an oesophagostomy tube. The key to keeping an O-tube in place is to situate the tube far enough back so that the tortoise is unable to hook out the tube with it's leg. A pair of curved haemostats are introduced into the oesophagus and displaced laterally. Care should be taken to avoid the jugular vein and carotid artery. The skin tents and usually the vessels slip dorsally or ventrally. The skin is cut with a scalpel blade and the haemostats pushed through. The feeding tube is grasped and pulled through the incision and out through the mouth. It is best not to cut it to length at this stage (as it is easier to pull through the incision) but measuring and marking the tube before beginning surgery is wise. Once pulled out the mouth the tube is cut to an appropriate length and directed back down the oesophagus. The tube can be secured using a Chinese finger trap suture or using surgical tape and sutured to the skin with horizontal mattress sutures. In aquatic species securing knots with superglue is advised. Dressing the leg can be useful as it covers the rough scales over the elbow joint further reducing the changes of the tube being pulled out.

Body weight should be monitored when an O-tube is in place. Initially weight gain can be marked due to the filling of the bladder and bowels, after this initial increase faecal and urine output will roughly equal input and the weight will stabilise. Tortoises are perfectly capable of eating voluntarily even with the tube in place. Once this has occurred and the tortoise is feeding well, supplemental feeding can be stopped. Once the tortoise is holding weight without supportive care the O-tube can be easily removed conscious.

Clocal prolapses in both sexes.

Organs that can prolapse can be the bladder, colon, cloaca, oviduct or clocacl organ. Causes for prolapses can vary. Anything that can cause straining or a weakening of the musculature can lead to prolapses. As such a full faecal examination and blood profile (including ionised calcium) is required along with radiography to check for eggs, bladder stones, intestinal foreign bodies, tumours etc. Surgical intervention is likely and can vary from replacement and a purse string suture to amputation or exploratory surgery.

Most cases presented in males are cloacal organ prolapses and the approach taken to these cases will be considered here. It is important to note that females have a cloacal organ too. The cloacal organ is solely used for reproduction it has no excretory function. Trauma after mating can also lead to a cloacal organ prolapse. Amputation can be performed under propofol or alfaxalone anaesthesia. The organ is extracted using tissue forceps. A haemostat can be clamped close to the cloacal mucosa. The main blood supply is in the centre. Horizontal mattress sutures with a monofilament material can be used to compress the main part of the stump. The tissue distal to the clamp can be removed and the mucosa sutured together.