

## Case Report : Urolith Surgical Removal in a Green Iguana (*Iguana iguana*)

(LAPORAN KASUS : BEDAH PENGELUARAN BATU KANTUNG KEMIH  
PADA SEEKOR IGUANA HIJAU (*IGUANA IGUANA*))

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### ABSTRACT

Two years old male Green Iguana (*Iguana iguana*) weighing 1.3 kilograms presented with a swelling mass in the abdomen. Clinical signs, palpation and radiography images indicated urolith in the urinary bladder. The mass was radiopaque and had a width of 37 mm and a length of 41 mm. Clinical findings, examination and radio-imaging confirmed urolithiasis in the urinary bladder. Coeliotomy and cystotomy were performed to remove the urolith. Two days after surgery, the iguana regained its appetite and normal urate secretion was observed. Prognosis is good when surgery is performed on a healthy animal.

Keywords: green iguana; urolith; coeliotomy; cystotomy

### ABSTRAK

Seekor iguana hijau (*Iguana iguana*) jantan berumur dua tahun dengan bobot 1,3 kg datang dengan keluhan ada massa tumbuh membesar di dalam abdomen. Tanda-tanda klinis, hasil palpasi dan radiografi menunjukkan adanya urolit di dalam kantung kemih. Massa adalah radiopak dan memiliki lebar 37 mm dan panjang 41 mm. Gejala, pemeriksaan klinis dan radiografi meneguhkan telah terjadi urolithiasis pada vesika urinaria. Coeliotomi dan sistotomi diindikasikan untuk mengangkat batu kantung kemih/urolith. Dua hari setelah operasi urolith, nafsu makan iguana sudah kembali dan sekresi urat terpantau normal. Operasi pengangkatan urolith yang dilakukan pada hewan yang sehat memiliki prognosis yang baik.

Kata-kata kunci: iguana hijau; urolit; coeliotomi; sistotomi

### INTRODUCTION

Reptiles such as iguanas are common exotic pets in Indonesia (Raharjo *et al.*, 2008; Dewi, 2016; Raharjo *et al.*, 2016). Urolithiasis is a common finding in iguanas kept as pets (Reavill and Schmidt, 2013; Raharjo *et al.*, 2016). The core cause of urolith formation is still uncertain, yet dietary imbalance, dehydration and urinary tract infection is thought to cause urolith in the bladder (Kwantes, 1992; Morrisey, 1999; Norton,

2005; Lemm *at al.*, 2010; Reavill and Schmidt, 2013).

A two years old male Green Iguana was presented with complains of a swelling in its abdomen. Palpation and radiography images confirmed the presence of urolith in the urinary bladder. Cystotomy is indicated for the urolith removal due to the size of the urolith. The purpose of this report is to present our experience with invasive surgical removal of an urolith in a green iguana.

## CASE HISTORY

### Signalements

Two years old male Green Iguana weighing 1.3 kg.

### Anamnesis

The owners noticed a swollen of an abdominal mass around eight months ago. The iguana showed discomfort and staining during defecation and urate secretion. Blood was found in the iguana's droppings. The iguana was fed daily with water spinach or *kangkung* (*Ipomoea aquatic*) and fruits on alternate days. No signs of anorexia.

### Clinical Signs

A spherical hard mass was palpated in the caudal coelomic cavity. The iguana got more uneasy when the coelomic cavity was palpated.

### Radiography

An x-ray was performed with the iguana in the dorsal recumbence. X-ray result confirmed the presence of urolith in the urinary bladder. (The urolith or bladder stone has a dimension of 41 mm length and 37 mm width).

### Diagnose

Bladder stone was confirmed as diagnose with the given based on anamneses, clinical signs and radiography.

### Prognosis

Prognosis is fairly good due to the urolith size when treatment is done in early stage.

### Treatment

The iguana was manually restrained while premedication and anaesthetic drugs were administered intramuscularly at the forelimb. Dosage for atropine (0.025%) 0.25 mg/mL is 0.02 mg/kg (body weight), ketamine (10%) 100 mg/mL is 50 mg/kg (body weight), acepromazine (1.5%) 15 mg/mL is 0.3 mg/kg (body weight). The iguana was placed into a tub prior to the anesthetic injection and placed at a dark and quiet part of the room.

Approximately after 45 minutes the iguana was taken out of the tub and placed at dorsal recumbence position for gas intubation (Figure 1). Direct mask intubation was placed in the beginning at 4% of isoflurane and 2% of oxygen. After about 5 minutes the iguana got into deep anaesthetized, then the intravenous infuse tube was used as the endotracheal tube and placed

into the epiglottis right behind the fleshy tongue. Isoflurane on flow was then maintained at 2%.

Surgical equipments and draping are prepared. An incision was made in the median of the coelom. The skin was held using toothed forceps and straight mayo scissors were used to widen the incision for about 5 cm. An incision was then made on the peritoneal wall with a 15# surgical blade.

The bladder was located and two stay suture fixations were placed on the bladder wall. A moist gauge was placed around the bladder to minimize urine leakage/contamination into the coelom. A longitudinal incision was made on the dorsal aspect of the bladder, carefully avoiding the big blood vessels (Dewi, 2016; Girolamo and Mans, 2016). The urolith is either removed with little pressure or by using a toothed forceps (Figure 2; Figure 3). The bladder was emptied and flushed with saline (Kwantes, 1992) using a 60 mL syringe. These procedures were carried out until the bladder is clean.

The bladder wall is then closed with simple interrupted suture then continued by Lambert continuous suture using a polyglyconate 4-0 USP suture and a rounded, automatic needle (Dewi, 2016). The coelomic cavity was flushed with saline and excess fluids aspirated using a suction pump. A horizontal mattress suture was used to close both skin and muscle layer. Antiseptic was applied at the surgical site.

The animal was then placed in a warm and quiet enclosure. Complete recovery was achieved after about one hour. The animal was given NSAID (Carprofen 0.2 mg/kg IM q48h), antibiotics enrofloxacin 8 mg/kg diluted 1:1 with saline water (injected intramuscularly) IM q24h and topical antibiotic cream (Bioplacenton<sup>®</sup>, topically q24h). Wound dressing is changed daily for a week, and left open after day 5<sup>th</sup> until skin incision's wound healing. Skin sutures were removed after six weeks.

## DISCUSSION

Lizard species, such as the iguanas are predisposed to the formation of urate and ammonium urate concretions (Farmina Vet Research, 2010). Herbivorous reptiles are very challenging to feed, where diet must consist of vitamin and calcium-rich leafy greens (Avila-Guevara, 2012). While Allen and Oftedal (1996) said, leafy greens and non-starchy vegetables should be limited to an iguana diet; fruits are



Figure 1. Iguana placed in the dorsal recumbence and direct mask incubation of Isofluron.



Figure 2. The bladder stone could be seen clearly inside the urinary bladder of the iguana.



Figure 3. Post-surgery comparisons of the iguana and the urolith.



Figure 4. Radiopaque mass revealed in the urinary bladder.

best avoided. The iguana presented for this case was feed with only *kangkung* on daily basis. According to Adieni and Subagio (2008), *kangkung* is high in purine.

Reptiles are less likely to exhibit overt pain, it is more challenging to assess if pain is present in reptile patients. Strained postures were presented while urate secretion which indicates the animal is in pain (Mayer and Bay, 2006). The symptom of urolithiasis in iguanas would cause anorexia, constipation and dysuria (Reavill and Schmidt, 2013). Anamneses from the iguana's owner was little blood in the urate secretion and staining was noticed while urate was secreted and defecation. Palpation during physical examination showed that there was a huge mass in the coelomic cavity which indicates a urolithiasis in the bladder (Blahak, 1994). Size range of urolith varies from sand-like material to large individual stones that may grow filling entire urinary bladder (Tion *et al.*, 2015). Radiography was performed to confirm the size and amount of the urolith stone. Radiography image revealed the presence of the urolith. The urolith was radiopaque and shows a oval mass in the coelomic cavity (Figure 4). The mass was radiopaque and had a 37 mm of width and 41 mm of length. Surgical removal of the stone is the most frequent treatment when stones can't be dissolved and is very useful for prevention of recurrences (Farmina Vet Research, 2010).

Coeliotomy and cystotomy was indicated for the urolith removal. Unresolved urolith can lead to urinary bladder wall trauma, urinary infections, urinary obstruction, egg binding and fecal retention (Norton, 2005; Lemm *et al.* 2010).

Before sedation the animal was given atropine and acepromazine (ACP) were used as premedication. Atropine blocks the actions of acetylcholine at muscarinic receptors at the parasympathetic nervous system. As a result, parasympathetic effects are reduced. In this case, atropine was used to prevent bradycardia and promote bronchodilation (Ramsey, 2011). Acepromazine is a drug that has depression effects on the CNS causing sedation. However when used alone the sedative effect of ACP in unreliable and should be combined with other anesthetic drugs (Ramsey, 2011). In this case ACP was combined with ketamine. Ketamine is a drug that antagonizes the excitatory neurotransmitter glutamate at the receptors at the central nervous system. It provides chemical

restrain, anesthesia and visceral and somatic anesthesia (Ramsey, 2011). Approximately 45 minutes after induction drugs were administered, the iguana was noted to be profoundly anesthetized. The iguana was then intubated with an intravenous catheter for Isofluron at 2%. Carprofen was given intramuscular prior to sedation to provide anti-inflammation and mild analgesic (Trnkova *et al.*, 2007). Sedation was maintained using 2% isofluron and 2% of oxygen.

An incision was made at the paramedian of the ventral abdomen to open the skin, abdominal muscles and peritoneum. In lizards from the family *Iguanidae* and *Agamidae* the paramedian or median incision is preferred. However in chameleons incisions are made on the lateral because the bladder is easier to access through the flank. The incision should be slightly longer than the thickest of the urolith. Note should be taken as the abdominal portal vein runs right under the peritoneum abdominal muscles (Kwantes, 1992).

Stay suture were placed on the bladder wall for fixation. Moist gauze was placed around the bladder to minimize urine contamination or leakage into the coelom. A longitudinal incision was made on the dorsal aspect of the bladder. The bladder stone was removed by giving little pressure and by using the toothed forceps. The bladder was flushed clean to avoid urolith reoccurrence (Morrisey, 1999; Raharjo *et al.*, 2016).

The bladder was closed with a double layer suture using simple interrupted and continuous Lambert. The continuous Lambert causes the bladder to curl inverts therefore minimizing urine leakage into the coelomic cavity. After ensuring that the cealomic cavity is clean from urine and other debris, the abdominal muscles and skin was sutured using horizontal mattress with a non-absorbable suture. Absorbable synthetic monofilament suture material is recommended because the skin in reptiles needs to support most of the tensile strength of coelomic incision (Girolamo and Mans, 2016). The horizontal mattress ensures the muscle will connect. The sutures need to be removed when the wound dries.

Post-operative medication included antibiotics (Enrofloxacin), NSAID (carprofen) and topical Bioplacenton<sup>®</sup>. Enrofloxacin is a broad spectrum bactericidal antibiotic which is effective in soft tissue, skin and urogenital infection. Bioplacenton<sup>®</sup> contains placenta extract and

neomycin sulphate which promotes wound healing and had topical antibacterial effects. Recovery from sedation took around four hours. The iguana was behaving normally the following day and normal urination was observed. Three days after surgery urine containing little blood was noticed in the enclosure and two days later normal urate was secreted.

### CONCLUSION

Urolithiasis is a health problem in captive iguanas. Radiography revealed one radiopaque mass in the bladder. Cystotomy is a rational approach to treat iguanas with bladder stone infection. When surgery is performed on a healthy animal the prognosis is good.

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