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Case Report

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Caseous Abscess in a Shingleback Lizard (*Tiliqua rugosa*) with *Klebsiella* sp. Infection

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Abstract

An adult male shingleback lizard (*Tiliqua rugosa*), weighing 700 grams, was presented with a swelling growth on the left lobe of the head. Clinical examination indicated a mass growth, and the lizard was diagnosed with caseous abscess accumulation. Surgical intervention was performed to remove the caseous abscess. Post-surgery treatment consists of enrofloxacin, meloxicam, tramadol, multivitamin, and topical antibiotic cream. Laboratory bacterial culture from the removed caseous abscess revealed *Klebsiella* sp. infection. Six months after the surgery, the shingleback lizard was presented with no swelling reoccurrence in a clinical healthy condition.

KEYWORDS
Caseous abscess, *Klebsiella* sp., Shingleback lizard, *Tiliqua rugosa*

INTRODUCTION

The shingleback lizard (*Tiliqua rugosa*) is a native lizard species found in Australia. This particular species is also known as the bobtail lizard. The shingleback lizard has heavy bony deposit scales known as the osteoderms. Short and wide stumpy tails resemble the head of the specimens, which confuses the predators. The shingleback lizard is an omnivore reptile which consumes mainly snails and vegetables (Mattison, 2009). Closely related to the shingleback lizard, the blue-tongue skink is a common reptile patient seen in veterinary practices (Kochli *et al*., 2008). This knowledge increases the importance of veterinary care for the shingleback lizard.

Abscesses in reptiles are usually large, inflamed, solid masses that should be concerned about (Harkewicz, 2001; Acik *et al*., 2018). A solid mass abscess occurs in reptiles because of the lack of lysozymes which breaks the pathogen in a liquid state (Harkewicz, 2001). Bacterial infections leading to a caseous abscess are common in reptiles (Govendan *et al*., 2019). *Klebsiella* sp. is a Gram-negative bacterium which has been recorded in several reptile cases (Wijayanti *et al*., 2013; Tang *et al*., 2014; Green, 2019). Infection caused by *Klebsiella pneumoniae*. in a red-footed tortoise has zoonotic potential (Tang *et al*., 2014). In the present case, the study aimed to describe the clinical condition and treatment of a shingleback lizard with a caseous abscess caused by *Klebsiella* sp. infection.

HISTORY, CLINICAL SIGNS AND DIAGNOSIS

An adult male shingleback lizard weighing 700 grams was presented with chief complaints of a growth on the head, less appetence and lethargy. The lizard is usually fed with canned dog food, green leafy vegetables, fruits, boiled eggs and live crickets. The body score condition was fair. Unilateral swelling was inspected and found to be a firm mass by performing palpation on the left lobe of the head. The consistency of the mass was solid. The mucous membrane appeared pink. Clinical presentation of the lizard with the mass is presented in Figs. 1 and 2.

Fig. 1. Oral cavity clinical inspection. Mucous membrane of the lizard was pink. Slight inflammation could be noticed on the left maxilla lobe of the oral cavity (arrow).

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Fig. 2. The shingleback lizard (*T. rugosa*) presented with a mass on the left lobe of the cephalous.

Abscess samples were sent to Balai Besar Veteriner Denpasar, Bali, Indonesia, for bacterial culture and identification. Culture results were identified to be *Klebsiella* sp. Based on clinical and laboratory findings, the lizard was diagnosed with *Klebsiella* sp. infection. Dubius-fausta was determined for the prognosis considering the physical health of the *T. rugosa*.

TREATMENT

The shingleback lizard was given sodium chloride 0.9% (PT Widatra Bhakti, Pasuruan, Indonesia) at a dose of 20 mL/kg bw subcutaneously under the skin on the dorsal part near the hindlimbs. Meloxicam tablet (PT Kalbe Farma Tbk., Bekasi, Indonesia) was administered orally (0.1 mg/kg bw). Enrofloxacin (PT Sumber Multivita, Jakarta, Indonesia) was administered intramuscularly (10 mg/kg bw) on the forelimbs. Administration of antibiotics, nonsteroidal anti-inflammatory drugs and fluids therapy were administered 24 hours prior to the surgery. Ketamine HCL 10% (KEPBO BV, Deventer, Holland) was administered intramuscularly on the forelimb (30 mg/kg bw). Additional analgesic of tramadol HCL (PT Indofarma Tbk., Jakarta, Indonesia) was administered subcutaneously on the forelimb (10 mg/kg bw). Within 20 minutes, the shingleback lizard showed negative signs of righting reflexes, jaw tone was negative, and pinch reflexes on the forelimb, hindlimb and skin was negative. Antiseptic, diluted chlorhexidine gluconate (OneScrub Chlorhexidine Gluconate 4% B/V, PT. Jayamas Medika Industri, Sidoarjo, Indonesia), was scrubbed around the surgical area. A number 8 scalpel was used to do an incision penetration into the skin at the most caudal part of the inflammation. A mayo-scissors was used to open into the thick muscle. A cheese-like whitish colour abscess was seen during the soft tissue surgery. A sterile cotton swab was used to remove all abscesses. Sterile saline was later mixed with diluted chlorhexidine and flushed into the abscess pocket to remove all remaining abscesses. Antibiotic ointment (Bioplacenton®, PT Kalbe Farma Tbk., Bekasi, Indonesia), which contains placenta extract and neomycin sulphate, was applied to the wound with a sterile cotton swab the ointment and evenly applied all around the pocket. A 3-0 non-absorbable silk suture material (PT Jayamas Medica Industri, Sidoarjo, Indonesia) was used to suture the open surgical wound. A simple interrupted suture was applied, avoiding the large scales. The surgical wound was then applied with Bioplacenton® cream (Fig. 3). Enrofloxacin (PT Sumber Multivita, Jakarta, Indonesia) was administered orally (10 mg/kg bw) daily for two weeks, meloxicam was administered orally (0.2 mg/kg bw) daily for five days, and 1 mL multivitamin (Caviplex sirup®, PT Erlangga Edi Laboratories, Semarang, Indonesia) was administered orally every two days once for three times. Post surgery the client was advised to daily change the newspapers on the bottom of the cage and to ensure the hygine of the enclosure is always clean. Upon discharge the lizard was presented after six weeks suture removal with no complains or relapse of the infection. Six months prior to the surgery the *T. rugosa* was presented for a general check up. Complains of dysecdysis several times during that period of ecdysis. Clinical examination showed no signs of reoccurence.

Fig. 3. After removal of abscess from the mass from the left lobe of the cephalous.

DISCUSSION

The shingleback lizard (*T. rugosa*) is a rare skink species found among the herpetoculture. This particular specimen was placed with two other lizards of the same species. Mating aggression could be one of the reasons for a bite wound to occur in the first hand, causing the infection to progress. Hungry leftover live crickets could have bitten and caused infection in between the large scales.

Superficial mass infection caused by abscess is a common finding in the herpetoculture (Harkewicz, 2001; Yardimci *et al*., 2010; Acik *et al*., 2018; Govendan *et al*., 2019; Govendan *et al*., 2020). An unresolved caseous abscess can lead to continuous pain, septicemic shock and even death. Hyporexic in reptiles could be caused by excessive pain or discomfort (Green, 2019; Ayers, 2016). The growth forming on the left lobe of the head was visible, and we found that *Klebsiella* sp. is the cause of the abscess formation. *Klebsiella* spp. is among the pathogens which are commonly isolated from saurian with skin infection (Hellebuyck *et al*., 2012). *Klebsiella oxytoca* is a species of *Klebsiella* that is recorded to be found in skin lesions in alligators (Novak and Seigel, 1986). *Klebsiella pneumoniae* was isolated from a Tunisian-eyed lizard (Timon pater) with an integument wound due to an interspecies fight (Green, 2019).

Surgical intervention for the caseous abscess was indicated. The scales of *T. rugosa* are thick and irregular-shaped plates (Mattison, 2009). The incision was performed outside the scales due to the thickness of the scales. All mass was removed using plain

forceps. Sedation is necessary to remove all debris (Harkewicz, 2001). Chlorhexidine gluconate is proven to be beneficial as an antimicrobial agent (Harkewicz, 2001; Alworth *et al*., 2011;Cota *et al*., 2021); we used it to irrigate all debris material and as an antiseptic wash. Secondary intention healing is not warranted with saurian with skin infection due to the possibility of prolonged wound healing and secondary infections (Green, 2019). Everting suture pattern is preferred in reptiles (Green, 2019); however, due to the lack of space between the thick scales of the *T. rugosa*, a simple interrupted pattern was performed.

Enrofloxacin at a dose of 10 mg/kg bw was administered as a broad-spectrum antibiotic to counter any reoccurrence of the infection (Agius *et al*., 2020; Kurniawan and Govendan, 2020; Kochli *et al*., 2008). The fluoroquinolones antibiotic is an effective sensitive antibiotic against *Klebsiella* sp. infection (Vishwas *et al*., 2021; Du *et al*., 2014). Meloxicam has proven good analgesic effects in Tiliqua spp. (Kehoe *et al*., 2016; Kochli *et al*., 2008). The usage of an additional opioid, tramadol HCl, helps in pain management in reptiles (Baker *et al*., 2011). Caviplex syrup, which consists of multivitamins of Vitamin A, vitamin D, vitamin B complex and vitamin C is a good multivitamin as it helps generate wound healing and also as an appetite stimulant. Multivitamins help to support the lack of vitamins in the diet (Hoppmann and Barron, 2007).

Suture removal are suggested to be done at least six - eight weeks post surgery (Govendan *et al*., 2020; Kubiak, 2019; Govendan *et al*., 2018; Divers, 2006). Six months post-surgical treatment, the shingleback lizard was presented for a general check up with good body condition, and no swelling reoccurrence was observed.

Post surgery recovery has always have dysecdysis (Alworth *et al*., 2011), however with proper education on husbandry and wound management to the owners this issue could be minimized.

CONCLUSION

The occurrence of *Klebsiella* sp. infection in reptiles, especially in the shingleback lizard in this study, may be due to the transformation of bacteria in an opportunistic environment. Combination treatments consist surgical, systemic medication, topical wound flushing and antibiotic cream application, husbandry management effectively treated the caseous abscess in shingleback lizard due to *Klebsiella* sp. infection.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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