

Case Report Rapport de cas

Gastrointestinal obstruction caused by a radiolucent foreign body in a green iguana (*Iguana iguana*)

Markus Büker, Ulrike Foldenauer, Stefka Simova-Curd, Sandra Martig, Jean-Michel Hatt

Abstract – This report describes an intestinal obstruction in a green iguana (*Iguana iguana*). The patient was presented with vomiting and subtle signs of abdominal pain. Radiographs and ultrasound imaging did not reveal any abnormalities. A coeliotomy was performed and a 30-cm piece of absorbent cotton was removed surgically from the large intestine.

Résumé – Obstruction gastro-intestinale causée par un corps étranger radiotransparent chez un iguane vert (*Iguana Iguana*). Ce rapport décrit un corps étranger causant un blocage intestinal chez un iguane vert (*Iguana iguana*). Le patient fut présenté pour cause de vomissement et signes faibles de douleur abdominale. Les radiographies ainsi que l'examen écho diagnostique ne révélèrent aucune pathologie. Néanmoins, une coeliotomie permettra l'extirpation d'un bandage de gaze de coton de 30 cm du gros intestin.

(Traduit par les auteurs)

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The green iguana (*Iguana iguana*) is an arboreal herbivorous reptile native to Central and South America. It is commonly found in captivity as a pet, particularly in recent years. A number of reptiles, including the green iguana, will consume a wide variety of foods if offered, such as growing shoots, fruit, and flowers (1). Gastrointestinal foreign bodies, caused mostly by sand and gravel ingested with the food are not uncommon (2,3). Due to the large variety in the shape of natural food ingested by these animals, there is always a danger of ingestion of other foreign bodies remotely similar to food in shape and texture (4). To our knowledge, this is the first report of an intestinal obstruction in a green iguana caused by a linear foreign body. It underlines the importance of exploratory coeliotomy in a case where commonly used imaging techniques did not lead to a diagnosis.

Clinic for Zoo Animals, Exotic Pets and Wildlife (Büker, Foldenauer, Simova-Curd, Hatt), Division of Diagnostic Imaging (Martig), Vetsuisse-Faculty of the University of Zurich, Switzerland.

Address all correspondence to Dr. Markus Büker; e-mail: m.bueker@myemail.ch

Dr. Martig's current address is Department of Veterinary Clinic and Hospital, Service of Diagnostic Imaging, University of Melbourne, 250 Princes Highway, Werribee, VIC 3030, Australia.

Dr. Büker's current address is Kleintierpraxis Dr. E.-U. Peitzmeier, Meente 24, 32479 Hille-Oberlütbe, Germany.

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Case description

An 8-year-old female, 2.66-kg green iguana was presented to the Clinic for Zoo Animals, Exotic Pets and Wildlife, Vetsuisse Faculty, University of Zurich with vomitus. Vomiting had started a day previous, and had occurred repeatedly from that time on. Vomitus consisted of brown-greenish, partially digested stomach content without hemorrhagic constituents. Vomiting occurred up to a few hours after feeding. The reptile was housed with 2 other iguanas in an indoor terrarium of about 1.4 × 2.4 m floor space and 2.2 m height. The ownership and husbandry of the iguana corresponded to the Swiss laws of possession and animal welfare (5). The diet consisted of herbaceous food (approximately 50% vegetables, 40% leafy greens, 1% to 5% grains, and 5% to 9% fruits). Within the cage, a range of temperatures between 25°C to 38°C was provided by infrared heat lamps and an UV radiating lamp. The terrarium bottom cover was lined with newspaper. According to the owner, the other 2 animals did not show any signs of disease.

On physical examination, the iguana showed a reduced general condition and slight signs of pain were evident during abdominal palpation. Lateral and ventrodorsal radiographs of the coelom were acquired and revealed a large amount of heterogeneous, foamy gastrointestinal content, and a large pocket of air localized centrally in the coelom. There was uncertainty whether this gas pocket was within the gastrointestinal tract or represented free coelomic gas (Figure 1). On a subsequent horizontal beam lateral projection of the coelom of the standing iguana the gas bubble was localized in the dorsal most aspect of the coelom just ventral to the spine. The foamy gastrointestinal content was interpreted as normal ingesta and a diagnosis of possible pneumocoelom was made.

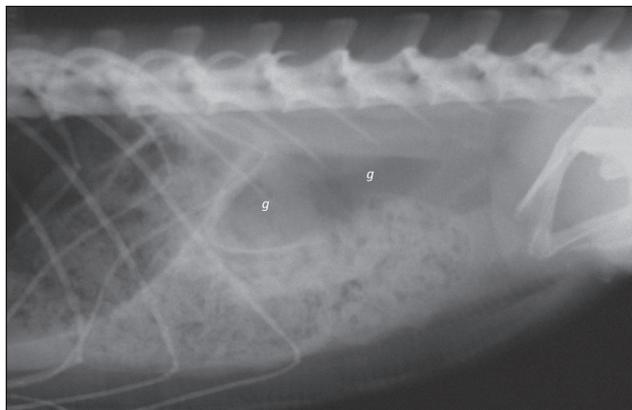


Figure 1. Lateral abdominal radiograph of a green iguana (*Iguana iguana*) with foamy gastrointestinal content and gas accumulation (g) ventrocranial to the kidneys. The foamy intestinal content was believed to be normal ingesta, but it most likely represents the surgically removed foreign body.

Subsequently, an ultrasonographic evaluation of the coelom was performed. There was a moderate amount of anechoic free coelomic fluid. A gas interface was present in the dorsal aspect of the coelom. However, it could not be determined whether the gas was localized intraluminally or represented a pneumocoelom. The tentative diagnosis was pneumocoelom due to perforation of the digestive tract or a septic disease of unknown etiology.

Coelomic paracentesis was unsuccessful as the iguana was highly stressed during this manipulation and anesthesia would have been needed. Because of suspected gastrointestinal perforation and deteriorating general condition, a routine coelomic exploratory surgery was performed on the same day. The owner declined blood examination because of financial reasons.

Exploratory coeliotomy was performed under general anesthesia, which was induced with propofol (Propofol 1% MCT Fresenius, Fresenius Kabi AG, Switzerland) 10 mg/kg body weight (BW) intravenously in the ventral tail vein, and maintained with isoflurane (IsoFlo; Abbott AG, Switzerland) 2.1% in O₂ with an oxygen flow rate of 0.3 L/min and 0.2 L/min air, delivered via an endotracheal tube (in a non-rebreathing system, Fabius; Dräger, Germany) and with spontaneous respiration (6). Analgesia was provided with butorphanol (Morphasol; Gräub AG, Switzerland) 1 mg/kg IM 30 min prior to anesthesia induction, and Meloxicam (Metacam; Boehringer Ingelheim, Switzerland) 0.2 mg/kg SC. Single doses of both enrofloxacin (Baytril 10%; Provet AG, Switzerland) 10 mg/kg SC and esomeprazol sodium (Nexium; AstraZeneca, Switzerland) 0.5 mg/kg IV were administered preoperatively (7,8).

After the patient was placed in dorsal recumbency on a heating pad and the operating field was aseptically prepared for surgery, a paramedian skin incision was made to visualize the coelomic organs. During the opening of the coelomic wall no abnormalities were noted, especially there were no signs (“positive pressure”) of a pneumocoelom.

Significant abnormal findings included a dark red to violet ileum and cecum with profound vascular stasis and congestion. There was no sign of necrosis. The intestinal contents at the level of the ileum and cecum were firm and appeared to cause an

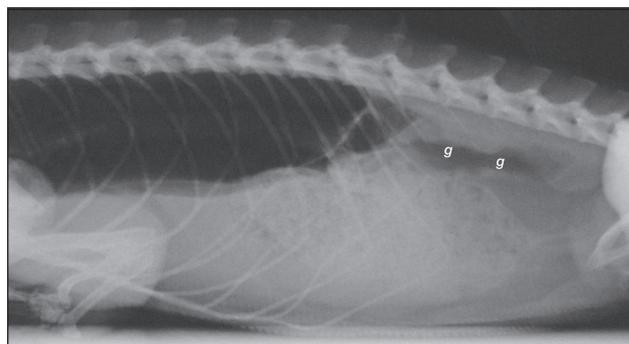


Figure 2. Horizontal abdominal radiograph of a green iguana (*Iguana iguana*) with gas accumulation (g) ventrocranial to the kidneys. The gas cavity appeared more dorsal than in the lateral abdominal radiograph (see Figure 1).

obstruction. A cecotomy was performed, and an approximately 30-cm long piece of absorbent cotton, along with firm intestinal contents was removed (Figure 2). After removing the foreign body, the wound edges were approximated with monofilament suture material (Monocryl 4-0, Ethicon, Germany) by 2 layers in a continuous, inverting suture. Rapid regeneration of the affected intestine could be visualized by an increase in intestinal motility and serosal recoloration. The coelomic wall was closed with a single, continuous suture (Monocryl 4-0). The skin was closed with an everting horizontal quilled suture (Monocryl 4-0).

Postoperative treatment included enrofloxacin (Baytril 10%) 10 mg/kg PO once daily, azithromycin (Zithromax; Pfizer, Switzerland) 10 mg/kg PO every other day as antibiotics, and sucralfate (Ulcogant; Merck, Switzerland) 750 mg/kg PO 3 to 4 times daily to prevent gastric ulceration. On the second day post operation, fresh fruits and hacked salad were offered. Defecation resumed without difficulty at day 3 post operation and the iguana was released from hospital with medication for 1 wk. The owner was instructed to pay special attention to defecation. On follow-up examination after 1 wk the iguana was in good health. A second follow-up examination was not necessary because of the good clinical condition of the animal, which was still in good health after 3 mo.

The owner was interviewed postoperatively to trace the source of the foreign body and it was ascertained that a companion iguana had a white bandage 3 days before. The loss of the dressing material had not been noticed.

Discussion

According to Lightfoot (9), foreign body ingestion is common in iguanas; however, it may be difficult to determine whether or not the foreign body is clinically significant or an incidental finding. Gastrointestinal foreign bodies reported in reptiles occurred in turtles (2,10–12), crocodiles (13,14), caiman (15) and snakes (2,16), but were often not obstructive. To the authors' knowledge, reports of foreign bodies in reptiles are rare, although they are a frequent problem. Bradley et al (3) described 2 radiopaque stones, ingested by a green iguana.



Figure 3. Intraoperative view of the removal of a 30-cm long intestinal foreign body (gauze bandage) in a green iguana (*Iguana iguana*).

Common gastrointestinal diseases in reptiles are gastritis, intestinal intussusceptions, diarrhea as a result of inadequate dietary fiber or parasites, neoplasms, and foreign bodies. In summary, endoparasites are the most common causes of gastrointestinal diseases in reptiles (12).

Signs associated with gastrointestinal diseases in reptiles include anorexia, polyphagia, pica, cloacal prolapse, vomiting, diarrhea, constipation, lethargy, and weight loss (2,12). Acute lethargy, abdominal distension, obstipation and anorexia might be the only signs of gastrointestinal diseases in reptiles (2,3). Vomiting is a rare clinical sign of gastrointestinal disease in lizards and usually carries a poor prognosis (2). Surgery is indicated for removal of foreign bodies (17). The patient described here showed vomiting and mild abdominal pain.

Diagnostic imaging can contribute significantly to the evaluation and treatment planning of the patient with gastrointestinal disorders, even though the digestive tract is poorly visualized on survey radiographs, and contrast studies are often needed to delineate the gastrointestinal tract (2,12,18). Therefore, radiographs of the coelom were carried out first (12,18). In the radiographs the gaseous findings were diagnosed as a pneumocoelom, supported by the second lateral radiograph in horizontal beam. Thereby the gaseous structures appeared ascended dorsally. In reptiles, however, the gastrointestinal tract can range far to the dorsal coelom and so the gas bubble could be localized to an intrainestinal site. In order to constitute a pneumocoelom, the gas must be localized at a place in the coelom where no gastrointestinal structures exist, such as between the liver and coelomic wall. To clarify, an ultrasonographic examination was done which could not eliminate a pneumocoelom completely, but the findings suggested evidence of a disorder of the digestive tract. It is difficult to discern normal large quantities of cecal gas from abnormal coelomic gas and experience is needed to evaluate the ultrasonic scan (18).

A gastrointestinal barium study was not performed since intestinal perforation was considered as a possible differential diagnosis. Furthermore, due to the animal's deteriorating condition there was not enough time to do a contrast study, which needs about 72 h in a green iguana, and there is a considerable

variation in intestinal transit (19). An endoscopic examination allows a good visualization of internal structures of the coelomic cavity and is less invasive (2,20,21). Nevertheless, we decided to do a surgical exploration to get a larger overview of the coelom, in particular of the intestinal tract.

Because the overall state of health was not impaired on the basis of the general examination, septicemic events appeared unlikely. However, a blood examination would have been beneficial, but was declined by the owner for financial reasons. The quick decision for exploratory surgery was beneficial in this case to prevent intestinal necrosis, perforation, or cloacal prolapse, even though the radiologic diagnoses did not include a foreign body.

The source of the dressing material ingested by the iguana was ascertained easily and clinical signs must have developed over 3 d or less, since the owner did not notice the loss of the other iguana's bandage. This suggests a subacute, progressive clinical course of the obstruction over a few days until clinical findings became conspicuous. This case highlights the importance of a thorough history. Unfortunately, the owner was not able to provide any information about objects that had disappeared from the terrarium.

The intestinal segment involved seems to be anatomically predisposed for impaction. The proximal colon shows large transverse folds subdividing it into 5 pockets, in which food can be retained for up to 3.5 d (22). In this case, the folds may have formed a barrier for the gauze bandage.

The short hospitalization and prophylactic application of antacids and histamine type-2 receptor antagonists were used to prevent gastric ulcers, which have been described as a common problem in herbivorous reptiles (8). A prolonged antibiotic medication was not prescribed, because the animal was doing well, the medical application was difficult for the owner and stressful for the lizard. Antibiotic therapy, therefore, was discontinued after 10 d.

In conclusion, the present case demonstrates the risk of foreign body ingestion in iguanas. This case also emphasizes that the absence of clear signs by radiography and ultrasound and the absence of clear indications by the owner may not rule out a foreign body. Even if clinical diagnostics show no clear results and there is a suspicion of a gastrointestinal dysfunction caused by a foreign body, a surgical procedure may be a valuable diagnostic and therapeutic approach.

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