

The unusual case of a renal urolith in a Mara (*Dolichotis patagonum*, Zimmermann 1780) in captivity



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Abstract

The mara (*Dolichotis patagonum*) is a large rodent originating from Argentina, and is frequently kept in zoos worldwide. Little is known about their diseases, particularly those affecting the urinary system. In this report, the authors describe a case of renal and urethral bilateral lithiasis. The aetiology of urolith formation is multifactorial, with the factors

age, gender, urinary infections, diet, and urine pH contributing to the development of this pathology. This case is a contribution to alert for the diseases and metabolic disorders that can affect these animals.

Key words: urolith formation; *Dolichotis patagonum*; rodent; calculus; kidney

Introduction

Mara (*Dolichotis patagonum*) is a large, digitigrade, monogamous rodent of the family Caviidae native to Argentina (Campos et al., 2001; Fensome and Mathews, 2016). This species has been categorised as Near Threatened in the IUCN Red List of Endangered Species (Roach, 2016). Although they are often kept in zoo collections worldwide, there is little information available about their diseases (Batard and Lahitte, 2009).

Case

The cadaver of an adult female was sent from the Zoo Santo Inácio (Avintes,

Portugal), for *post mortem* examination at the Necropsy Service at the University of Trás-os-Montes and Alto Douro (Vila Real, Portugal) to determine the cause of death. At external examination, ulcers on the left hind limb and pale mucous membranes were observed. Internal examination, hemopericardium (about 5 mL), pulmonary oedema, congestive hepatomegaly and intestinal tympanism were detected. The kidneys were of different size, the right was larger (5 x 4 cm) and the left was smaller (3 x 2.5 cm) (Fig.1). At renal section, the right kidney showed dilation of the renal pelvis, with medullar atrophy (Fig

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2A). In the left kidney, the pelvis was dilated with the presence of a yellow, irregularly contoured calculus, 1 cm in major diameter (Fig 2B). The right ureter

was dilated in all its extension, with the presence of calculus of 1 cm with yellow colouration (Fig 3). The final diagnosis was renal and urethral lithiasis, with hydronephrosis of the right kidney.

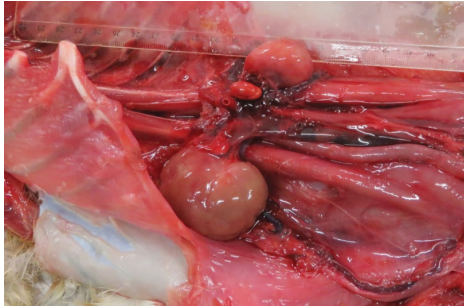


Figure 1. The kidneys presented different sizes, the right was larger (5 x 4 cm and the left smaller (3 x 2.5 cm)

Discussion

In *D. patagonum*, trauma is the most common cause of death. Pseudotuberculosis, poxvirus and histoplasmosis are some of the infectious diseases most commonly described in these animals in captivity (Batard and Lahitte, 2009). The few reports of pathology affecting the urinary tract on maras are related to a segmental aplasia of the left ureter with severe secondary unilateral hydronephrosis in a mara

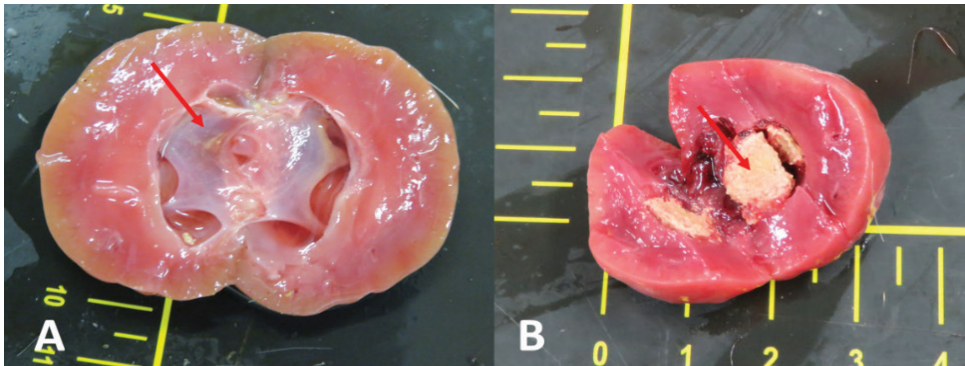


Figure 2. Upon section, the right kidney (A) showed dilation of the renal pelvis, with medullar atrophy. In the left kidney (B), the pelvis was dilated with presence and a yellow, irregularly contoured calculus, 1 cm diameter

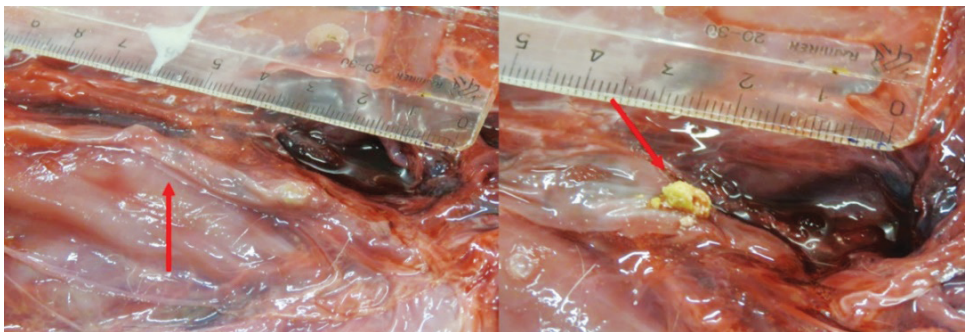


Figure 3. The right ureter was dilated in all its extension with the presence of a calculus of 1 cm with yellow colouration

that died of trauma, described by Rosas-Rosas et al. (2006). This is the first report of renal and urethral lithiasis, with hydronephrosis on a *D. patagonum*.

Unfortunately, it was not possible to determine the composition of calculi. Based on descriptions in domestic rodents, they may consist of calcium salts (Reavill and Lennox, 2020). The aetiology of urolith formation is multifactorial, where species, age, gender, anatomical or functional abnormalities of the urinary tract, metabolic abnormalities, urinary infections, diet, and urine pH are among the causative factors (Maxie, 2015). This pathology is very common in domestic animals, particularly in cats (Maxie, 2015; Zachary, 2016). Based on the information available, we can hypothesise that urolith development was associated with age or diet since the animal was held in captivity, and also could have had previously undetected urinary infections. This case likely started as unilateral urethritis were the only clinical signal were pain, which can be difficult to detect in these animals since they live in groups and can be very shy (Campos et al., 2001). With the development of the disease, ureteral obstruction resulted in hydronephrosis with loss of function of the ipsilateral

kidney, while renal lithiasis developed on the other kidney. At the time of death, more than two-thirds of the total functional renal parenchyma was lost and the animal developed renal failure.

This case, although presented with some limitations, is an important contribution to understanding the diseases that can affect these animals and can contribute to the future monitoring of these diseases in zoos.

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Neobični slučaj bubrežnog kamenca u mare (*Dolichotis patagonum*, Zimmermann 1780.) u zatočeništvu

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Mare (*Dolichotis patagonum*) su veliki glodavci podrijetlom iz Argentine koji su česti stanovnici zoooloških vrtova diljem svijeta. Ipak, malo je toga poznato o njihovim bolestima, posebice onima koje utječu na mokraćni sustav. U ovom radu autori opisuju slučaj obostrane formacije bubrežnih i uretralnih kamenaca. Na etiologiju formiranja

kamenca utječe više čimbenika, s tim da su dob, spol, urinarne infekcije, prehrana i pH urina neki od čimbenika koji doprinose razvoju ove patologije. Ovaj članak predstavlja doprinos upozorenju na bolesti i metaboličke poremećaje koji mogu pogoditi ove životinje.

Ključne riječi: formacija urolita, *Dolichotis patagonum*, glodavac, kamenac, bubreg