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Lethargy and hind limb paralysis in a day-23 timed pregnant rat

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Animal technicians at our facility found a moribund, gestational day-23 Sprague-Dawley rat in its cage. This animal was part of an IACUC-approved toxicology study in which timed-pregnant rats were housed in groups of two or three in shoebox cages with autoclaved corn cob bedding monitored for contaminants. Environmental conditions in the animal facility were automatically controlled and logged by an Andover Controls Continuum system (North Andover, MA). The rat room was on a 12:12 h light/dark cycle; temperature and humidity were maintained at 21± 2° C and 30–70%, respectively. Semipurified AIN-93 rodent diet (Bio-Serv, Frenchtown, NJ) and reverse-osmosis drinking water distributed through an automatic water distribution system were continuously available. Strict pathogen control of the facility is maintained through vendor screening and an active monitoring program using sentinel animals.

When we examined the rat it was lethargic, depressed, and unable to move its hind limbs. We took blood for selected clinical chemistry and requested the results statim. The clinical chemistry results showed an increase in blood urea nitrogen (BUN), calcium, creatinine, and total protein (**Table 1**).

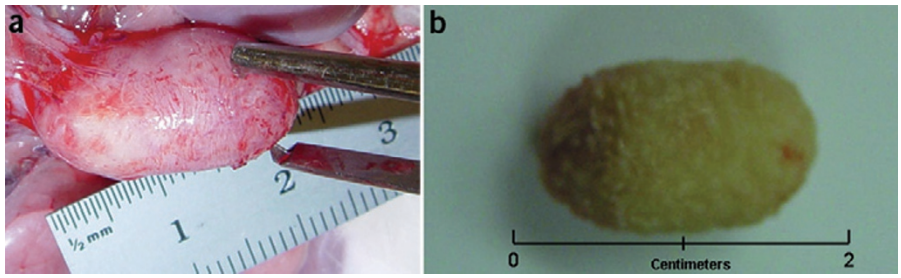

FIGURE 1 | Distended urinary bladder of a day-23 timed pregnant Sprague-Dawley rat's bladder (a). Dissection of the bladder revealed a 1 x 2 cm vesical calculus (b) consisting primarily of magnesium ammonium phosphate.

Based on the rat's condition and the clinical chemistry results we euthanized the rat and performed a necropsy. The uterus contained 19 pups, a number of which were undergoing autolysis/resorption. In addition, a dead fetus was present in the vaginal canal. We noticed a 1–2 mm tear in the wall of one uterine horn. The urinary bladder was distended and upon dissection contained a 1 × 2 cm, oblong-shaped stone (**Fig. 1**). The bladder stone was yellow with a granular appearance. We fixed selected tissues in neutral buffered 10% formalin and submitted the stone for analytical chemistry. On chemical analysis it was found that both interior and exterior layers of the bladder stone consisted mainly of magnesium ammonium phosphate. No nidus was found.

Based on the clinical and necropsy findings what is the cause of the rat's morbidity and paralysis? Is this a common finding in rats? What are potential contributing factors to this problem?

What's your diagnosis?

TABLE 1. Clinical chemistry results from a moribund, day-23 timed pregnant Sprague-Dawley rat

Test	Within range	Outside range	Reference range[a]
Albumin, g/dl	4.7		2.0–6.2
Blood urea nitrogen, mg/dl		195	9–30
Calcium, mg/dl		14.1	8–12
Creatinine, mg/dl		3.7	0.4–1.0
Total protein, g/dl		7.7	4.5–6.5

[a]Reference range is taken from the CIIT's Clinical Chemistry Services range

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