

## **Anal-vulvar atresia and agenesis of coccygeal vertebrae in a newborn donkey – case report**

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### **ABSTRACT**

Anal-vulvar atresia and agenesis of the coccygeal vertebrae is a rare condition that has never been reported before in donkeys, and only a single case in sheep. In this light, we sought to describe the surgical approach and postoperative care of a newborn donkey with this congenital abnormality. A female donkey was treated that was less than 24 hours old, weighing 15 kg, with increased perineal volume and the absence of an anus. The diagnosis was made by clinical examination, which also found an absence of the vulva and coccygeal vertebrae. A surgical approach followed using anoplasty and temporary fixation of a plastic probe, and a urethra attached to the skin. The postoperative period was followed by daily cleansing, antibiotic, anti-inflammatory and analgesic therapy, and removal of the plastic tube at 10 days. The early diagnosis and treatment enabled complete success and the animal's recovery.

**Keywords:** asinine; congenital; malformation; neonate; surgery

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### **Introduction**

Congenital malformations are morphofunctional abnormalities that are present at birth, which can be lethal, semi-lethal or compatible with life (BADAWY, 2011). Genetic, environmental or both factors may be involved, but the cause is often unknown. Among environmental conditions, the ingestion of toxic plants and viral infection during pregnancy have been implicated (GANGWAR et al., 2014; PALSANIA et al., 2019).

Anal atresia consists of complete occlusion, as the most common birth defect of the lower gastrointestinal tract, mainly in calves and piglets (UZAL et al., 2016). There are four classifications of anal atresia: type I, where there is a normal rectum and a stenotic anus; type II, or imperforate anus, characterized by a normal rectum and the absence of an anus; type III, where there is formation of a blind fundus in the proximal rectum and the

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absence of an anus; and type IV with a blind fundus in the proximal rectum and the presence of an anus (CARVALHO et al., 2012).

The purpose of this report is to present a case of anal-vulvar atresia and agenesis of coccygeal vertebrae in a donkey treated at the Ivon Macedo Tabosa Veterinary Hospital of the Federal University of Campina Grande, which was successfully treated after a surgical approach which recovered defecation and urination functions. This appears to be a unique case in this species, and similarly has only been found once before in a sheep (CHAUDHARY et al., 2016).

### Case report

*Case history.* A female donkey of the Nordestino breed, less than 24 hours old, was admitted to the Large Animal Clinic and Surgery sector of the Ivon Macedo Tabosa Veterinary Hospital of the Federal University of Campina Grande, Patos, Paraíba, Brazil, presenting an increase in volume in the perineal region and apathy (Fig. 1).



Fig. 1. Increase in volume in the perineal region.

*Clinical findings.* On physical examination, the patient was in lateral decubitus, apathetic, with a distended abdomen, abdominal pain and strain, hyperemic mucous membranes, with a heart rate of 104 bpm and respiratory rate of 32 breaths per minute. There was an increase in volume in the perineal region, approximately 20 × 12 cm, of soft consistency, without any increase in local temperature, and with the absence of painful sensitivity. On inspection, the absence of an anal sphincter, vulva and coccygeal vertebrae was observed (Fig. 2).



Fig. 2. Anal-vulvar atresia and agenesis of coccygeal vertebrae

*Surgical procedure.* Initially, pre-anesthetic medication was administered with acepromazine 0.1 mg/kg, i.m. and diazepam 0.05 mg/kg, i.v.; induction with propofol 3 mg/kg; maintenance with isoflurane; and local infiltrative block with lidocaine without a vasoconstrictor. Surgical correction was initiated by incising the skin adjacent to the ventral region of the perineum; divulsion of the subcutaneous tissue; skin incision and removal of the content; excision of the skin and remaining tissue; identification of the final portion of the rectum, and fixation of the rectal mucosa to the skin with 1-0 nylon thread in a simple isolated pattern, and placement and fixation of a plastic tube (syringe-20 mL) with 1-0 nylon and a simple isolated pattern to prevent stenosis; followed by identification and

incision of the urethra and fixation just below the anus, with 1-0 nylon and a simple isolated pattern; cruciate pattern myorrhaphy, using 1-0 nylon; and Wolff pattern dermorraphy, using 1-0 nylon.

*Postoperative management.* The postoperative protocol consisted of daily cleaning of the wound with water and 2% chlorhexidine; 1500 IU tetanus serum, i.m., single dose; antibiotic therapy with gentamicin 6.6 mg/kg, i.v., SID, for 7 days and amoxicillin 10 mg/kg, i.m., SID, for 7 days; anti-inflammatory flunixin meglumine 1.1 mg/kg, i.v., SID, for 3 days. After 10 days, the suture stitches and the plastic tube were removed, and this procedure enabled defecation and urination during internment and after discharge (Fig. 3).



Fig. 3. The image shows the anus after removal of the plastic tube

## Discussion

During fetal development, the cloaca is divided into the urogenital rectum and sinus by the urorectal fold, connecting to the cloacal membrane to form

the primitive perineum. The cloacal membrane is divided into the cranial portion, referred to as the urogenital membrane, while the caudal portion consists of the anal membrane. Abnormalities in the rupture of the latter cause anal atresia (VIANNA and TOBIAS, 2005; HERMAN and TEITELBAUM, 2012). In this report, the absence of rupture was observed, characterizing type II anal atresia or imperforate anus.

Anal atresia is a rare condition in horses and, when present, is accompanied by abnormalities in the urogenital tract, being reported in isolated cases (TOTH and SCHUMACHER, 2015). Risk factors during pregnancy related to vitamin A deficiency have been associated in some species (UZAL et al., 2016) and Herpesvirus type I infection in horses (ANDERSON et al., 1986). Strokes resulting from placental ischemia have also been incriminated and proven experimentally in some species (VAN DER GAAG and TIBBOEL, 1980). In cattle, vigorous rectal palpation for diagnosis of pregnancy between 31-45 days of pregnancy can result in abnormalities (LAIKUL et al., 2010).

Affected animals present with abdominal distention, absence of feces, tense abdomen, perineal distention and tenesmus, and when surgical correction is not performed, death occurs after between 7–19 days (RADOSTITS et al., 2007). Physical examination is sufficient to confirm the diagnosis, however radiographs can assist in determining the type of atresia (ANTONIOLI et al., 2017). In this report, radiographs were not taken in view of the severity of the condition in which the patient arrived, and we opted for the most urgent surgical referral. A differential diagnosis for these cases is the retention of meconium, which is common in foals (TEIXEIRA et al., 2010).

Simple skin transection or anoplasty are the proposed surgical approaches, the latter being recommended more often because of the lower risk of stenosis compared to the former (NELSON et al., 2015). Fixing a plastic tube is a simple and useful technique to prevent stenosis during the healing process (NIWAS et al., 2020). In this report, the accomplishment of the anoplasty and the use of the plastic probe proved successful.

## Conclusion

The early care and diagnostic and surgical approaches were decisive for the successful recovery of the patient diagnosed with anal-vulvar atresia. The etiopathogenesis of congenital malformations in the asinine species has not yet been elucidated as it has in other species, which is justified by its rarity. Further studies are needed to identify the risk factors and raise awareness among owners to avoid them.

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#### **SAŽETAK**

Analno-vulvarna atrezija i ageneza kokcigealnih kralježaka rijetko je stanje koje dosad nije opisano u magaraca, naime opisano je samo u jednom slučaju u ovce. Upravo smo zbog toga nastojali opisati kirurški pristup i poslijeoperacijsku njegu u novorođenog puleta s ovom kongenitalnom abnormalnošću. Riječ je o ženki, staroj manje od 24 sata, tjelesne mase 15 kg, s povećanim perinealnim volumenom i bez anusa. Dijagnoza je postavljena na temelju kliničkog pregleda koji je otkrio i odsutnost vulve i kokcigealnih kralježaka. Usljedio je kirurški zahvat s anoplastikom i privremenim postavljanjem plastične sonde i uretre pričvršćene za kožu. Poslijeoperacijski je period uključio dnevno čišćenje, antibiotičku, protuupalnu i analgetičku terapiju te uklanjanje plastične cijevi nakon deset dana. Rana dijagnoza i liječenje omogućili su potpun uspjeh u oporavku životinje.

**Ključne riječi:** magarac; kongenitalni; malformacija; pule; operacija

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