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An uncommon localisation of a vegetal foreign body in a dog: a case report

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ABSTRACT: The goal of this study was to describe the ultrasonographic and computed tomographic appearance of a penile foreign body in a dog for the first time. We describe an unusual penile localisation of a grass seed awn in an 11-year-old mixed-breed dog referred for a computed tomography study after a severe haemorrhage from the penis. A fistulous tract was observed after plain and post-contrast whole-body computed tomography acquisition; the foreign body was localised with ultrasound and removed under ultrasonographic guidance, with the complete healing of the penile lesion. Grass awns are common foreign bodies in dogs and cats and are commonly localised in the ear canal, subcutaneous tissue, interdigital space, eyelid, conjunctiva and nasal or oral cavity. These foreign bodies pose a threat due to their peculiar structure, which facilitates their easy access to the affected area and their transit through the body. Clinical signs are often non-specific, and imaging modalities such as ultrasonography and computed tomography are useful techniques for localisation. Our report demonstrates that the combination of computed tomography and ultrasound techniques was crucial for the exact localisation and mini-invasive retrieval of the grass seed.

Keywords: grass awn; diagnostic imaging; penis; computed tomography; ultrasound

Grass awns of the family Graminaceae, especially *Avena sterilis* (Schultz and Zwingenberger 2008), are frequently observed as foreign bodies in dogs and cats (Schultz and Zwingenberger 2008; Cherbinsky et al. 2010; Vansteenkiste et al. 2014), and are very common in Italy. The threat posed by these vegetal bodies to animals lies in their peculiar structure, characterised by the sharp point of the floret of the awn and the backward pointing of the barb (Schultz and Zwingenberger 2008; Cherbinsky et al. 2010): the result is easy access to the affected area with an unpredictable route of migration (Vansteenkiste et al. 2014). These foreign bodies can migrate to different parts of the body, and they may result in direct damage to the affected area (Schultz and Zwingenberger 2008) and secondary infections caused by the transport of microorganisms like *Actinomyces* and *Nocardia* spp. (Schultz and Zwingenberger 2008; Vansteenkiste et al. 2014). The most frequently affected areas are ears, feet, paws, nose, eyelids, eyes, thorax, abdomen and subcutaneous tissue (Schultz and Zwingenberger 2008; Cherbinsky et al. 2010; Vansteenkiste et al. 2014; Marchegiani et al. 2017). Clinical signs may be helpful in localising grass awns (Vansteenkiste et al. 2014), but usually the ultrasound imaging modality is more effective for the localisation and removal of these foreign bodies. The combination

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of ultrasound and computed tomography increases the chances of a correct diagnosis and immediate treatment. Here, we report an unusual case of a penile foreign body.

Case description

An 11-year-old mixed-breed dog was referred for a computed tomography study after a severe haemorrhage from the foreskin. On a previous ultrasound performed while the dog was awake, a heterogeneous area at the base of the penis was seen by the referring veterinarian. Blood cell count and biochemistry were within normal limits. The dog was sedated with 2 μg/kg intramuscular dexmedetomidine (Dexdomitor, dexmedetomidine hydrochloride injectable solution 0.5 mg/ml, Orion Corporation, Finland) and 0.2 mg/kg methadone (Semfortan, methadone hydrochloride injectable solution 10 mg/ml, Eurovet Animal Health B.V. for Deckra Italia) followed by 3 mg/kg intravenous propofol (Proposure, propofol injectable solution in lipidic emulsion 10 mg/ml, Merial Italia). After endotracheal intubation, general anaesthesia was maintained with 1.5–2% isoflurane (IsoFlo, inhalation anaesthetic, Esteve spa) and oxygen (2 l/min) with the patient positioned in sternal recumbency.

Plain and post-contrast computed tomography were performed with a multidetector computed tomography scan (BrightSpeed, Milwaukee, USA). The post-contrast computed tomography acquisition showed a fistulous tract, with a hyperattenuating and irregular wall in the left cavernous body of the penis, at the level of the caudal border of the *os penis* (Figure 1). A neoplastic lesion was excluded on the basis of computed tomography findings and, as differential diagnosis, a foreign body in the penis was considered. During preparation for ultrasound under anaesthesia, a small round lesion was visible dorsally and at the base of the penis, probably at the exit of the fistulous tract (Figure 2). Ultrasound showed a linear spindle-shaped hyperechoic structure localised in the caudo-dorsal part of the penis (Figure 3). The entire foreign body (Figure 4) was then successfully extracted under ultrasound guidance with a Hartmann forceps, and the lesion completely healed without further complications.

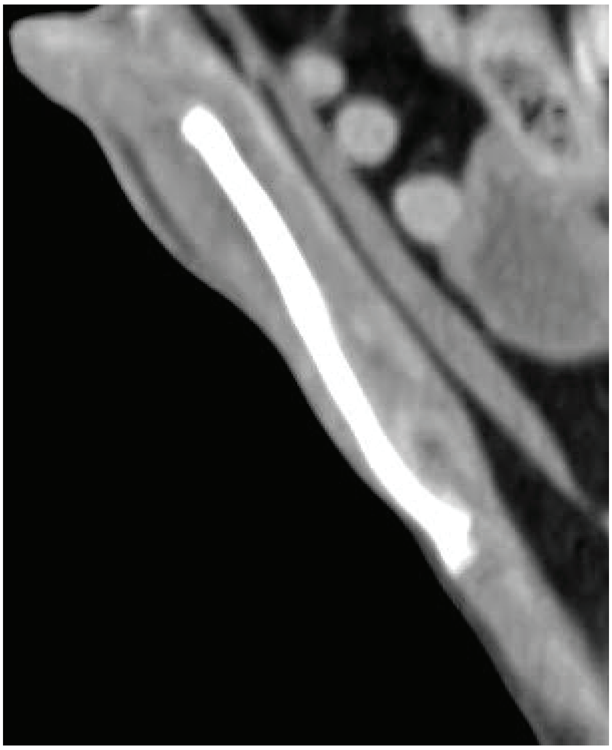

Figure 1. Computed tomography image of the fistulous tract

Figure 2. Photo of the circular penile lesion

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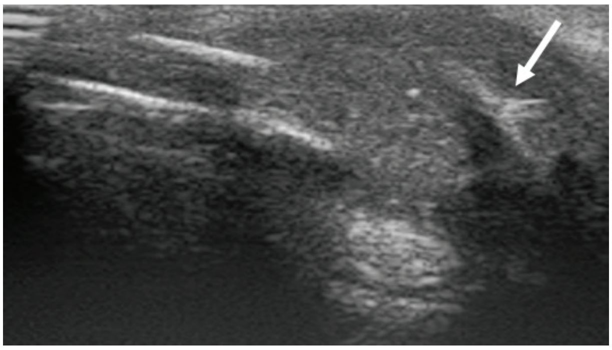

Figure 3. Ultrasound image of the penis in sagittal plane; a V-shaped hyperechoic structure is visible, corresponding to a vegetal foreign body (arrow)

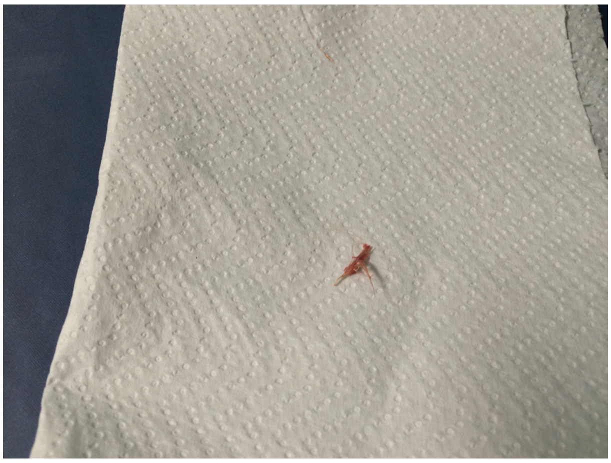

Figure 4. Picture of the vegetal foreign body after its retrieval

DISCUSSION

Grass awns are common foreign bodies in dogs and cats (Schultz and Zwingenberger 2008; Cherbinsky et al. 2010; Vansteenkiste et al. 2014). The threat of these vegetal bodies to animals is determined by their structure, characterised by the sharp point of the floret of the awn and the backward pointing of the barbs (Schultz and Zwingenberger 2008; Cherbinsky et al. 2010). These features permit an easy penetration of the skin while at the same time rendering retrograde movement almost impossible; this results in the migration of the foreign body to any site of the body through fistulous pathways (Vansteenkiste et al. 2014). Factors that can increase the prevalence of grass seed foreign bodies in animals are a long coat (these seeds are easily trapped between hair) (Schultz and Zwingenberger 2008; Cherbinsky et al. 2010), and hunting behaviour (breeds like Springer Spaniel or Golden Retriever come into contact with these kind of plants more often, especially during exercise in the field and during open-mouthed breathing) (Gnudi et al. 2005; Schultz and Zwingenberger 2008; Cherbinsky et al. 2010; Vansteenkiste et al. 2014; Marchegiani et al. 2017). Grass awns are most frequently found in the external ear canal, subcutaneous tissue, interdigital space, conjunctiva, and nasal and oral cavities, but they can also reach the thoracic or abdominal cavities or sublumbar musculature by penetrating the body wall, ingestion, or inhalation and subsequent migration (Schultz and Zwingenberger 2008; Cherbinsky et al. 2010; Caivano et al. 2014; Vansteenkiste et al. 2014). Grass awns have also been detected in the vagina (Agut et al. 2016), eyelid (Marchegiani et al. 2017) and bladder (Cherbinsky et al. 2010), but these sites are not common; in this last case, the migrating grass seed may cause obstruction or act as the nidus for calculus formation (Cherbinsky et al. 2010; Vansteenkiste et al. 2014). Clinical signs associated with grass seeds can usually be related to their anatomical localisation; pyrexia or neutrophilia may or may not be present after antibiotic administration prior to referral of the clinical case (Vansteenkiste et al. 2014). Removal of the foreign body and treatment of the secondary infections is an effective solution (Schultz and Zwingenberger 2008), but the migratory nature and the small size of grass awns makes localisation and complete resection by exploratory surgery difficult (Schultz and Zwingenberger 2008). Ultrasound and computed tomography are the most useful techniques to detect the exact position of the foreign body and to guide its retrieval (Gnudi et al. 2005; Schultz and Zwingenberger 2008; Cherbinsky et al. 2010; Vansteenkiste et al. 2014). Sonographically, grass awns appear as linear spindle-shaped hyperechoic structures of variable lengths, with two or three parallel reflecting interfaces corresponding to the seeds and seed covers (Gnudi et al. 2005; Schultz and Zwingenberger 2008). Often, an anechoic halo is present around the foreign body due to accumulation of fluid, which sometimes improves interface visualisation (Della Santa et al. 2008). Ultrasound permits a rapid, non-invasive and accurate localisation of the grass seed, with the possibility of performing an intraoperative ultrasonographic-guided retrieval (Della Santa et al. 2008). In computed tomography, grass seeds present as foci of soft tissue

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attenuation in air-containing structures, as elongated gas-containing foci in soft tissues or as slightly hyperattenuating foci with soft tissue (Schultz and Zwingenberger 2008; Vansteenkiste et al. 2014). When the foreign body cannot be directly visualised, computed tomography enables estimation of the exact position of the foreign body based on tissue abnormalities like cavitary lesions, tracts and pulmonary consolidation or tissue inflammation (Schultz and Zwingenberger 2008; Vansteenkiste et al. 2014). The combination of these two techniques improves the diagnosis and treatment of grass seed foreign body-associated disease, and allows for a rapid resolution for the patient, as in the case described here.

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