A vaginal fornix foreign body in a bitch: a case report

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ABSTRACT: A six-year-old intact female Lagotto Romagnolo was referred with a two-day history of purulent vulvar discharge associated with fever, lethargy, polyuria, polydipsia and signs of abdominal pain. Abdominal ultrasound revealed a grass awn foreign body in the vaginal fornix. Culture swabs obtained from the vagina revealed the presence of *Staphylococcus epidermidis* as the preponderant organism. Ovariohysterectomy was performed, and the presence of the grass awn was confirmed. A chronic-active vaginitis was found at histological examination. The dog recovered with resolution of all clinical signs. Differential diagnoses for acute vulvar discharge in bitches should include retention of vaginal foreign bodies. To the authors' knowledge, this is the first reported case of a grass awn foreign body in the vaginal fornix of a dog.

Keywords: grass awn; vagina; ultrasound; dog

Vaginal foreign bodies are rare in dogs and cats. To our knowledge, only six reports have been published in dogs (Ratcliffe 1971; Dietrich 1979; Jacobs et al. 1989; McCabe and Steffey 2004; Snead et al. 2010; Gatel et al. 2014), and three in cats (Cordery 1997; Nicastro and Walshaw 2007; Gatel et al. 2014). Grass awns are a common cause of foreign body disease in small animals, usually associated with complications such as abscesses or granulomas (Della Santa et al. 2008). These vegetal foreign bodies are most frequently found in the external ear canal, subcutaneous tissue, conjunctiva, nasal and oral cavity, but can also reach the thoracic or abdominal cavity or sublumbar musculature by penetration of the body wall, ingestion, or inhalation and subsequent migration (Cherbinsky et al. 2010). However, very little is known about their presence in the genital tract in the dog (Gatel et al. 2014). This case report describes the management of a grass awn located in the vaginal fornix in a bitch.

Case description

A six-year-old intact female Lagotto Romagnolo weighing 14.7 kg was presented with a two-day history of vulvar discharge, lethargy, polyuria and polydipsia and signs of abdominal pain. General examination revealed hyperthermia (39.3 °C), a purulent foul-smelling vulvar discharge and pelvic limb weakness. The last proestrus occurred 30 days previously. Also, the owner reported grass awns sticking out from the vulva six weeks ago. Complete blood cell count and serum biochemistry were unremarkable.

The main differential diagnoses included pyometra and urinary tract infection. Other possibilities were a urogenital tumour and congenital malformation of the genital tract. On ultrasound, uterine horns, body and cervix appeared thickened, but no signs of cystic endometrial hyperplasia or fluid accumulation in the uterine lumen were observed. The left ovary was homogeneously enlarged and hypoechoic, measuring 2 cm in diameter and its appearance was suggestive of neoplastic change. Also, a 1.50 cm-long, 0.2 cm-wide spindle-shaped hyperechoic structure, consistent with a grass awn, was detected in the vaginal fornix, ventral to the hypertrophic cervix (Figure 1).

A diagnosis of a vaginal fornix grass awn foreign body was made along with a suspicion of left ovary neoplasia.

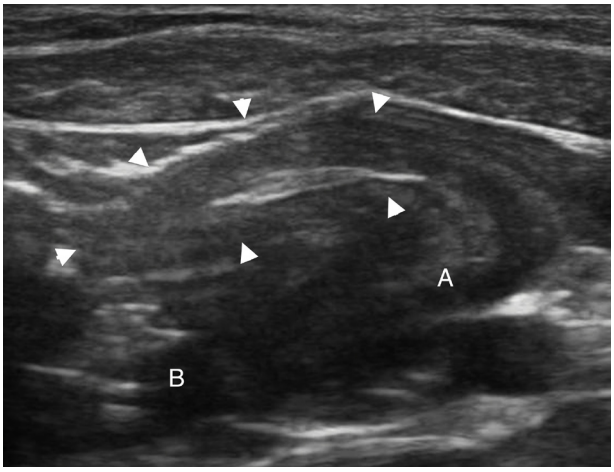

Figure 1. Oblique ultrasonographic view of the cervix. A hyperechoic grass awn located in the vaginal fornix (arrowheads) is visible. The grass awn appears as having a cranially oblique direction. The cranial oblique aspect of the vagina is on the left of image. Linear transducer (15 MHz); A = cervix; B = uterus

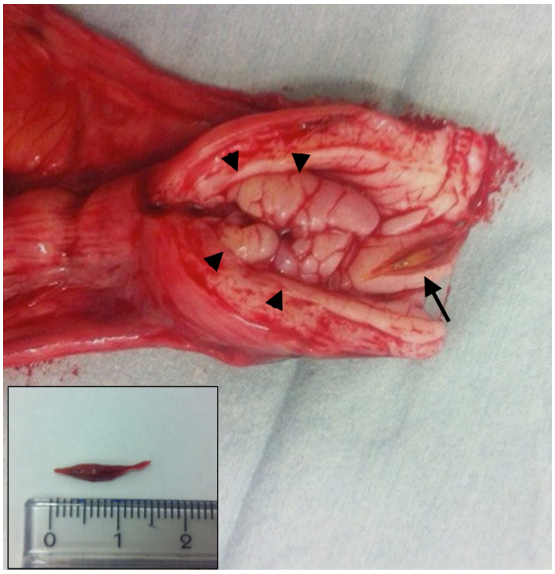

Figure 2. Dorsal view of the cervix after dissection. A grass awn of 150 mm is located at the level of the vaginal fornix (arrow), caudal to a hyperplastic cervix (arrowheads)

Vaginoscopy was considered, but ovariohysterectomy was preferred due to the suspicion of an ovarian tumour.

Ovariohysterectomy was performed under general anaesthesia, applying the uterine ligatures caudal to the cervix, to include the vaginal fornix in the dissection. The presence of the grass awn was confirmed after surgery (Figure 2).

Postoperatively, amoxycillin-clavulanic acid (20 mg/kg, Synulox; Pfizer) was administered every 12 h for 10 days. Haemolytic *Staphylococcus epidermidis* was isolated from a vaginal swab and was sensitive to the prescribed antibiotic. The bitch fully recovered.

A chronic active vaginitis was observed on histology, with foci of erosions in the vagina associated with inflammatory cell infiltration (Figure 3). The rest of the genital tract was hyperplastic but without any signs of infection. The left ovary was histologically diagnosed as a papillary adenoma.

Six months after the initial presentation, the bitch was in good general health and had no signs of vulvar discharge.

DISCUSSION AND CONCLUSIONS

Vaginitis occurs in both sexually intact and spayed bitches of any age or breed and may occur as a primary disease process or secondary to trauma, neoplasia, foreign bodies, and other abnormalities of the urogenital tract (Soderberg 1986; Johnson 1991; Feldman and Nelson 2004). Commonly clinical signs include vulvar discharge (Kustritz 2008), dysuria, pollakiuria and frequent licking of the vulva (Nicastro and Walshaw 2007). Vaginal foreign bodies are a rare cause of vaginitis and vaginal discharge in dogs and they can be challenging to diagnose (Snead et al. 2010). The duration of clinical signs varies from 21 days to two years (Snead et al. 2010; Gatel et al. 2014). The foreign bodies re-

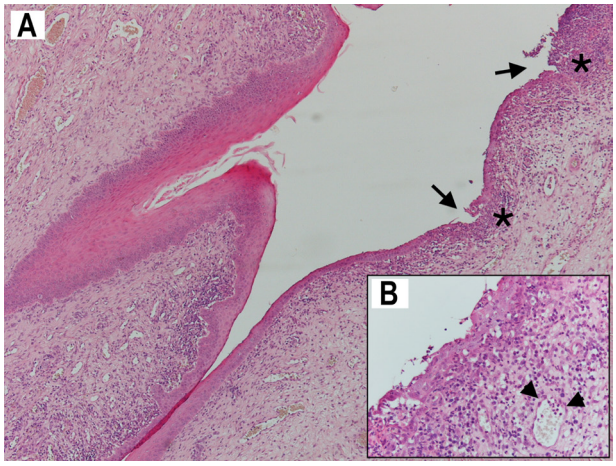

Figure 3. Histopathology of the vaginal fornix. (**A**) Epithelial erosions at the level of the vaginal fornix (arrows) and inflammatory infiltrate of the mucosa (asterisks). Haematoxylin and eosin (H&E); × 4. (**B**) Magnification of image A. Mucosal infiltration is composed of neutrophils, lymphocyte and plasma cells. Margination of vessel endothelium by leukocytes is also evident (arrowheads); × 10

ported include a piece of a lollipop stick, a disposable cigarette lighter, half of a ball-point pen, fragments of foetal calvarium and a grass awn (Ratcliffe 1971; Dietrich 1979; Jacobs et al.1989; McCabe and Steffey 2004; Snead et al. 2010; Gatel et al. 2014).

Grass awns represent common foreign bodies in small animals. Dogs are affected more commonly than cats. Also, hunting, working and long-haired breeds, such as the dog described here, are overrepresented (Schultz and Zwingerberger 2008). Many localisations are reported (Brennan and Ihrke 1983; Cherbinsky et al. 2010), but only one report exists describing a chronic grass awn migration in the vaginal lumen of a dog (Gatel et al. 2014).

Vaginal foreign bodies are a rare, but well-documented condition in human medicine. The majority of cases occur in children and main clinical manifestations include vaginal bleeding and foul-smelling discharge (Stricker et al. 2004). In humans, as in dogs, vaginal foreign bodies can be retained for long periods of time before being diagnosed (Wu et al. 1995; Smith et al. 2002).

To the authors' knowledge, this is the first reported case of a foreign body in the vaginal fornix in a bitch. After penetrating the vulva, the grass awn likely migrated through the vagina to the fornix. The barbed nature of the grass awn did not allow backward movement, resulting in severe tissue infection. In this case, the grass awn was presented in cranial oblique direction, with the stem oriented cranially, following the vaginal mucosa surface irregularities due to the chronic vaginitis.

Diagnosis of vaginal foreign bodies in the bitch relies on digital vaginal and rectal examination, plain and contrast radiographs, ultrasonography and vaginoscopy. As it was impossible to examine the entire vagina using ultrasonography, for completion of the diagnostic procedures vaginoscopy should have been performed in order to ensure that no further grass seeds were present.

In some cases, advanced imaging modalities including computed tomography or magnetic resonance imaging for suspected non-metallic foreign bodies may be required (Dietrich 1979; Soderberg 1986; Johnston et al. 2001; Feldman and Nelson 2004; Gatel et al. 2014).

In this case, ultrasonography substantially facilitated the diagnosis. Usually, the entire vagina cannot be examined via a transabdominal approach because of the interfering pelvic bones. However, the location of the grass awn in the cranial vagina may allow the foreign body to be imaged with ultrasound (Gatel et al. 2014). The ultrasonographic appearance of a grass awn in the vaginal fornix is consistent with its appearance in other tissues; ultrasonographically, grass awns usually appeared as a double/triple spindle-shaped echogenic interface within soft tissue (Gnudi et al. 2005). Ultrasound is a useful technique in the detection of radiolucent foreign bodies and can significantly improve the surgical planning (Staudte et al. 2004). Usually, during ovariohysterectomy, when ligating the uterine body, the most caudal ligature is placed at the junction of the cervix and uterine body (Howe 2006). In this case, the location of the grass awn in the vaginal fornix alerted the surgeon to the need for a ligation just caudal to the cervix, being careful not to interfere with the opening of the urethra. By this surgical approach, the ventral vaginal fornix was included in the dissection, allowing successful removal of the foreign body.

Definitive treatment of vaginal foreign bodies requires removal of the foreign body, in humans as well as in dogs (Stricker 2004; Snead et al. 2010). Foreign bodies located in the distal vagina may be removed manually or with forceps, while foreign bodies more cranial or embedded in the vaginal wall require vaginoscopic-guided retrieval (Ratcliffe 1971; Dietrich 1979; Soderberg 1986; Jacobs et al. 1989; Johnston et al. 2001; Feldman and Nelson 2004; McCabe and Steffey 2004; Stricker 2004). Ultrasound-guided retrieval of vaginal foreign bodies has been described in a bitch and in a queen (Gatel et al. 2014). Complications associated with vaginal foreign bodies in dogs include recurrent vaginitis, vaginal bleeding and fibrous tissue as a consequence of inflammation associated with the foreign body (Snead et al. 2010).

The peculiarities of this case consist in the unusual location of the foreign body, the shorter time between onset of symptoms and definitive diagnosis compared to other case reports, and the acute clinical presentation. Vaginal foreign bodies are usually associated with chronic vulvar discharge, and in dogs as in humans, rarely lead to systemic signs of illness. Even though the presentation of our case was acute, it is possible that the grass awn was present in the vaginal fornix for several days, as suggested by histological analysis which confirmed a re-acutisation of a chronic vaginitis.

Progesterone-induced immunosuppression may have played a role in the onset of clinical symptoms. Although an ovarian neoplasia could be a differential diagnosis for vulvar discharge in the bitch, the acute presentation and the localised vaginal inflammation associated with bacterial overgrowth

made the grass awn the most probable cause of the vaginal discharge in this dog.

In conclusion, retention of a foreign body should be a differential diagnosis for vaginal discharge in bitches. Ultrasound can be a valuable diagnostic tool to differentiate urogenital foreign bodies from other conditions with similar clinical signs such as pyometra, and to indicate the most appropriate surgical approach.

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