

Sublumbar grass awns in two cats: ultrasonographic features and ultrasound-guided retrieval

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Abstract

Case series summary Two adult cats were evaluated because of recurrent abscesses of the right lateral thoracoabdominal wall. The abscesses receded with antibiotics but relapsed shortly after therapy interruption. Ultrasonography identified fluid-filled lesions containing linear, hyperechoic material with distal acoustic shadowing in the sublumbar region of both cats. Ultrasound-guided retrieval of grass awns was performed in both cases, which resulted in complete clinical resolution.

Relevance and novel information While sublumbar abscesses in dogs are a relatively common disease, their occurrence in cats is much less common. To our knowledge, this is the first report describing the ultrasonographic features of sublumbar abscessation induced by foreign bodies and their ultrasound-guided retrieval in cats.

Keywords: Sublumbar; foreign bodies; grass awn; ultrasonography

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Introduction

While sublumbar abscesses in dogs (often resulting from bite wounds or grass awn migration) are a relatively common disease, their occurrence in cats is much less common.^{1–5} In cats, grass awns have been found in the ocular region, in the thoracic cavity (lungs, caudal mediastinum, heart), cervical spine and abdominal cavity (urinary bladder, common bile duct and peripancreatic region).^{1,3,4,6–13} CT features of a sublumbar abscess secondary to a grass seed lodged in the sublumbar muscles have been described in one cat that underwent surgical treatment.¹ To our knowledge, the ultrasonographic features of sublumbar abscessation induced by migrating foreign bodies and their ultrasound-guided retrieval have not been reported in cats.

The aim of this paper is to present the clinical and ultrasonographic findings observed in two cats affected by a grass awn-induced sublumbar abscess extending into the lateral thoracoabdominal wall; both cats underwent successful ultrasound-guided retrieval of the foreign bodies.

Case series description

Case 1

A 7-year-old neutered female, indoor–outdoor Maine Coon cat was referred in January for an abscess of the right lateral thoracoabdominal wall, noted for the first time by the owner 2 months earlier. It had recurred several times in the previous 2 months, despite surgical curettage and multiple courses of antibiotics. Coughing, sneezing or general prostration had not been reported by the owner. At presentation, the cat was pyrexia and a painful space-occupying lesion, with a length of about 15 cm and a height of 7 cm, and with multiple draining tracts could be appreciated in the dorsal portion of the right lateral thoracoabdominal wall. A complete blood

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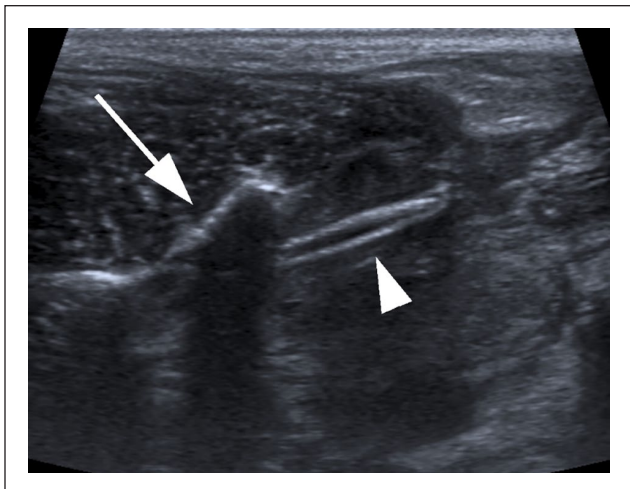


Figure 1 Case 1: view of the transverse process V sublumbar vertebra (arrow) showing a large sublumbar cavitory lesion containing a linear hyperechoic spindle-shaped structure with some distal shadowing consistent with a migrating foreign body (arrowhead)

cell count showed severe leukocytosis with band and toxic neutrophils; routine serum biochemistry and urinalysis were within normal limits.

Ultrasonographic examination was performed with a 12MHz linear transducer (Aplio 400; Toshiba). Within the abdominal wall, a large subcutaneous multi-cavitary lesion with several draining tracts was visible. One of the draining tracts could be followed to the right retroperitoneal space at the mid-lumbar level. A poorly defined, hypoechoic, irregularly marginated, cavitory lesion consistent with a right retroperitoneal abscess was detected in the right sublumbar region and located in the right ileo-psoas muscles, which did not show normal echotexture.

A 2.4mm long linear spindle-shaped shadow, with two hyperechoic parallel interfaces causing a dense acoustic shadow was imaged within this lesion, on the right ventrolateral aspect of the mid-lumbar spine, dorsolateral to the caudal vena cava (Figure 1).

Once the foreign body was deemed reachable with a non-surgical approach, the cat was sedated with methadone (0.2mg/kg IV; Dechra). General anaesthesia was induced with propofol (3mg/kg IV; Merial) and was maintained with isoflurane inhalant 1–2% (Virbac). After surgical preparation of the right lateral thoracoabdominal wall, Hartmann Alligator forceps were introduced in one of the previously detected fistulous tracts (with the aim of aligning it with the connecting tract between the parietal and the sublumbar abscesses and the foreign body), and directed towards the retroperitoneal foreign body, under ultrasonographic guidance. The forceps were opened and the foreign body grasped and successfully removed (Figure 2). Cytological analysis was not performed;

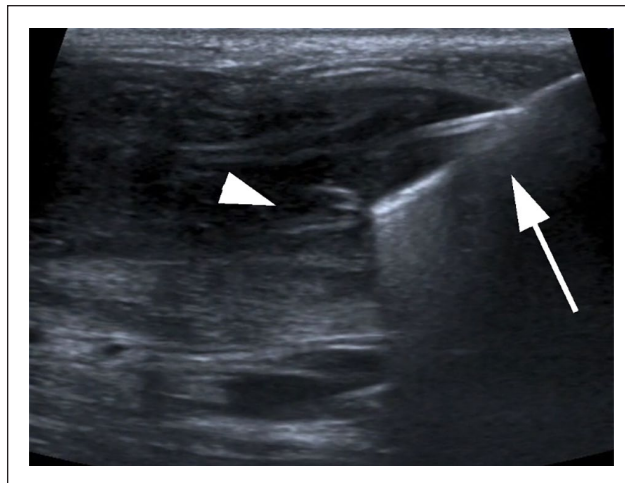


Figure 2 Case 1: oblique view of the sublumbar region during ultrasound-guided foreign body (arrowhead) retrieval with Hartmann Alligator forceps (arrow)

antibiotic therapy with amoxicillin/clavulanic acid (16 mg/kg PO q12h [Pfizer]) was prescribed for 2 weeks. Postoperatively, pain was controlled with methadone (0.2mg/kg IM q4–6h [Novartis]). Two months later, the cat was clinically normal.

Case 2

A 5-year-old castrated male, mostly outdoor domestic shorthair cat was referred for a large, recurring, right lumbar abscess, first noted 5 months earlier, in August. The cat had been previously treated with several courses of antibiotics: enrofloxacin (5mg/kg PO q24h [Bayer]) for 21 days and then amoxicillin/clavulanic acid (16 mg/kg PO q12h [Pfizer]) twice for 14 and 21 days, respectively. Despite initial therapeutic success, recurrence occurred each time after cessation of antibiotic therapy. At presentation, the cat was quite alert and responsive, although the owner reported prostration of the cat in the past few days.

Upon clinical examination, a large warm mass with no draining tract was detected at the right caudal abdominal wall. Blood testing was declined by the cat's owner. Ultrasound examination of the lesion was performed using an L8-18i linear probe (Logiq E R6; General Electric). Ultrasonographically, a large, well-defined cavitory lesion containing echogenic heterogeneous fluid was detected in the subcutaneous region. A thin fistulous tract connected this lesion with another large cavitory lesion located in the right caudal sublumbar region; two hyperechoic structures with linear interfaces and acoustic shadowing were imaged inside the sublumbar region.

The cat was sedated with butorphanol (0.2mg/kg IV; Zoetis) and anaesthetised with propofol (3mg/kg IV;



Figure 3 Two grass awn fragments retrieved in case 2

Merial). After intubation, general anaesthesia was maintained with isoflurane inhalant 1–2% (Virbac). After surgical preparation of the right abdominal wall, a small stab incision was performed in the skin overlying the subcutaneous abscess in order to align it with the fistulous tract and the sublumbar foreign bodies using ultrasound guidance again. Hartmann Alligator forceps were then inserted into the incision and the two fragments grasped and retrieved in two separate attempts (Figure 3). The shape of the retrieved foreign bodies was compared with the ultrasonographic images. Subsequently, approximately 25 ml of purulent material was suctioned from the sublumbar abscess and 60 ml from the subcutaneous lesion under ultrasonographic guidance. The latter abscess was flushed with saline and a Penrose drain applied in the subcutaneous abscess via the stab incision.

Postoperatively, pain was controlled with robenacoxib (1 mg/kg PO [Novartis]). Sensitivity testing of collected pus was declined by the cat's owner and broad spectrum antibiotic therapy with enrofloxacin (5 mg/kg PO q24h [Bayer]) was prescribed for 4 weeks. Recovery was uneventful: 36 months after the procedure, the patient was free of clinical signs and did not show any recurrence.

Discussion

Migration of vegetal foreign bodies poses a clinical challenge for the veterinarian and the clinical, diagnostic and therapeutic features have been evaluated in several studies, primarily involving canine patients.¹ Because most affected dogs show aspecific clinical signs, grass awn migration should be always considered as a differential diagnosis in patients living in areas where the disease is present.^{1,2,4–7,14–22}

Both cases presented in this report showed thoraco-abdominal wall abscesses as the presenting complaint, but no previous clinical signs reported by the owners

were suggestive of sublumbar grass awn migration as the inciting cause.

In our cases, the entry route of the foreign bodies could not be determined with absolute certainty but, as it occurs in dogs with the same location of plant material, inhalation was suspected as the entry route.^{5,14,17,19} Although respiratory clinical signs, such as coughing and sneezing, were not noted by owners in neither of the cases in the present report, Leal et al reported that 9/12 cats with tracheobronchial foreign bodies were asymptomatic.⁸

Ultrasonography proved to be the diagnostic modality of choice for the evaluation of patients with thoraco-abdominal wall abscesses because it allows identification of foreign material that, because of its peculiar morphology, in most instances can be recognised as a grass awn seed. Grass awns can be differentiated from wooden foreign bodies because of their linear spindle shape and multiple parallel, hyperechoic linear interfaces.^{2,5,7,14,17,20,21,23} Distal acoustic shadowing is a constant ultrasonographic feature of wooden foreign bodies, but it is not always present in plant awns (depending on their composition/thickness and on the angle of insonation); it is most likely to be seen in transverse views rather than in longitudinal views.²⁴

Once diagnosis was established, ultrasonography proved to be useful in therapeutic planning by allowing assessment of the feasibility of non-surgical retrieval. If a draining tract is present, it can be used to insert the forceps into the abscess. Given proper alignment, it can be obtained with the connecting fistulous tracts between the parietal and sublumbar abscesses and the foreign body (if alignment cannot be obtained, a new stab skin incision needs to be performed). Once inserted into the parietal abscess, the Hartmann Alligator forceps are directed under real-time ultrasound guidance through the draining tract to reach the sublumbar abscess and then the foreign body.²³ Special care must be taken to avoid large vessels, such as the aorta or the caudal vena cava, during both insertion of the forceps and grasping.

Furthermore, ultrasonography allows for a non-invasive overhaul of the whole infection site in search of multiple foreign bodies/fragments. Special attention needs to be paid to the retrieval procedure in order not to overlook smaller fragments that can lead to recurrence. Entrance of air and the flow of purulent material out of the lesion with secondary image quality degradation might be causes of procedure failure.

An alternative diagnostic imaging tool is CT, which usually allows adequate identification of the secondary lesions and draining tracts connecting them, but correct identification and localisation of the foreign body is uncommon.^{1,6} Both Schultz and Zwingenberger⁶ and Vansteenkiste et al¹ described the CT findings observed in dogs and cats with migrating grass awns; grass seeds were identified only in 4/14 and 6/32

patients, respectively, and only when located in the bronchi. This is probably due to the lower inherent contrast between the vegetal foreign material and the content of the abscess. Furthermore, CT does not allow real-time guidance of the surgeon, which is an inherent advantage of ultrasonography. Consequently, CT is considered a second line diagnostic tool in patients with a suspected plant awn-induced abscess.^{1,6}

Conclusions

Most subcutaneous abscesses in cats are secondary to bite wounds and are treated accordingly with antibiotics, or are eventually associated with surgical debridement in selected cases without any need for diagnostic imaging to be performed. This aetiology was also suspected in the cases presented in this report, but other possible causes had to be considered because of multiple episodes of recurrence. In both cases, ultrasonography showed high diagnostic accuracy by allowing for accurate assessment of the parietal lesions, depiction of the fistulous tracts connecting them with the sublumbar portion of the abscesses, and correct recognition and localization of the foreign bodies. Furthermore, the foreign bodies were safely retrieved under ultrasonographic guidance in a minimally invasive fashion without the need of a standard surgical celiotomy. This approach, as previously reported in dogs, allowed for a reduction in the duration of anaesthesia, reduced costs and allowed a faster recovery than the standard surgical procedure.^{23,25}

Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical approval The authors declared that this work involved the use of non-experimental animals only (owned or unowned), and followed established internationally recognised high standards ('best practice') of individual veterinary clinical patient care. Ethical approval from a committee was not necessarily required.

Informed consent Informed consent (either verbal or written) was obtained from the owner or legal custodian of all animal(s) described in this work for the procedure(s) undertaken. No animals or humans are identifiable within this publication, and therefore additional informed consent for publication was not required.

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References

1 Vansteenkiste DP, Lee KCL and Lamb CR. **Computed tomographic findings in 44 dogs and 10 cats with grass seed foreign bodies.** *J Small Anim Pract* 2014; 55: 579–584.

- 2 Gnudi G, Volta A, Bonazzi M, et al. **Ultrasonographic features of grass awn migration in the dog.** *Vet Radiol Ultrasound* 2005; 46: 423–426.
- 3 Brennan KE and Ihrke PJ. **Grass awn migration in dogs and cats: a retrospective study of 182 cases.** *J Am Vet Med Assoc* 1983; 182: 1201–1204.
- 4 Marx MB. **Grass awn migration in dogs and cats.** *J Am Vet Med Assoc* 1983; 183: 390–410.
- 5 Frendin J, Funkquist B, Hansson K, et al. **Diagnostic imaging of foreign body reactions in dogs with diffuse back pain.** *J Small Anim Pract* 1999; 40: 278–285.
- 6 Schultz RM and Zwingerberger A. **Radiographic, computed tomographic, and ultrasonographic findings with migrating intrathoracic grass awns in dogs and cats.** *Vet Radiol Ultrasound* 2008; 49: 249–255.
- 7 Cherbinsky O, Westropp J, Tinga S, et al. **Ultrasonographic features of grass awns in the urinary bladder.** *Vet Radiol Ultrasound* 2010; 51: 462–465.
- 8 Leal RO, Bongrand Y, Lepoutre JG, et al. **Tracheobronchial foreign bodies in cats: a retrospective study of 12 cases.** *J Feline Med Surg* 2017; 19: 117–122.
- 9 Tovar MC, Huguet E and Gomezi MA. **Orbital cellulitis and intraocular abscess caused by migrating grass in a cat.** *Vet Ophthalmol* 2005; 8: 353–356.
- 10 Brioschi V, Rousset N and Ladlow JF. **Imaging diagnosis – extrahepatic biliary tract obstruction secondary to a biliary foreign body in a cat.** *Vet Radiol Ultrasound* 2014; 55: 628–631.
- 11 Koutinas CK, Papazoglou LG, Saridomichelakis M, et al. **Caudal mediastinal abscess due to a grass awn (*Hordeum spp*) in a cat.** *J Feline Med Surg* 2003; 5: 43–46.
- 12 Granger N, Hidalgo A, Leperlier D, et al. **Successful treatment of cervical spinal epidural empyema secondary to grass awn migration in a cat.** *J Feline Med Surg* 2007; 9: 340–345.
- 13 Doyle CG, Allen JW and Ettinger SJ. **Foxtail-associated endocarditis in a cat.** *J Feline Med Surg* 2011; 13: 116–119.
- 14 Hopper BJ, Lester NV and Irwin PJ. **Imaging diagnosis: pneumothorax and focal peritonitis in a dog due to migration of an inhaled grass awn.** *Vet Radiol Ultrasound* 2004; 45: 136–138.
- 15 Cerquetella M, Laus F, Paggi E, et al. **Bronchial vegetal foreign bodies in the dog-localization in 47 cases.** *J Vet Med Sci* 2013; 75: 959–962.
- 16 Dennis MM, Pearce LK, Norrdin RW, et al. **Bacterial meningoencephalitis and ventriculitis due to migrating plant foreign bodies in three dogs.** *Vet Pathol* 2005; 42: 840–844.
- 17 Biretoni F, Caivano D, Rishniw M, et al. **Preoperative and intraoperative ultrasound aids removal of migrating plant material causing iliopsoas myositis via ventral mid-line laparotomy: a study of 22 dogs.** *Acta Vet Scand* 2017; 59: 12.
- 18 Whitty CC, Milner HR and Oram B. **Use of magnetic resonance imaging in the diagnosis of spinal empyema caused by a migrating grass awn in a dog.** *N Z Vet J* 2013; 61: 115–118.
- 19 Sutton A, May C and Coughlan A. **Spinal osteomyelitis and epidural empyema in a dog due to migrating conifer material.** *Vet Rec* 2010; 166: 693–694.

- 20 Caivano D, Biretoni F, Rishniw M, et al. **Ultrasonographic findings and outcomes of dogs with suspected migrating intrathoracic grass awns: 43 cases (2010–2013).** *J Am Vet Med Assoc* 2016; 248: 413–421.
- 21 Citi S, Mannucci T and Pedalà F. **Acute pancreatitis associated with peritoneal migration of grass awn in two dogs.** *Acta Vet Beograd* 2017; 67: 587–592.
- 22 Armbrust LJ, Biller DS, Radlinsky MG, et al. **Ultrasonographic diagnosis of foreign bodies associated with chronic draining tracts and abscesses in dogs.** *Vet Rad Ultrasound* 2003; 44: 66–70.
- 23 Della Santa D, Rossi F, Carlucci F, et al. **Ultrasound-guided retrieval of plant awns.** *Vet Radiol Ultrasound* 2008; 49: 484–486.
- 24 Staudte KL, Hopper BJ, Gibson NR, et al. **Use of ultrasonography to facilitate surgical removal of non-enteric foreign bodies in 17 dogs.** *J Small Anim Pract* 2004; 45: 395–400.
- 25 Della Santa D. **Minimally invasive ultrasound-guided retrieval of migrating sublumbar plant awns in eight dogs.** Proceedings of the EVDI Meeting; 2011 Aug 30–Sept 3; London, England, p 32.