

and consider the use of fresh frozen plasma to minimise ongoing haemorrhage.

In human medicine, prophylactic administration of plasma or recombinant factor VIII is encouraged to mitigate severe bleeding events. Screening for blood-borne infectious disease is required for plasma derived products with well documented outbreaks of HIV and hepatitis C in recipients during the 1970s and 80s. Novel therapies that have been investigated include gene therapy (currently in early trials) and the use of monoclonal antibodies.

Attempts have been made to reach the breeder of this patient to recommend an external coagulation panel be performed in all offspring and to retire the bitch from the breeding pool. If any other pups had prolongations in aPTT, external Factor VIII levels would be recommended. Tracing of this patient's pedigree and whole genome sequencing of any confirmed offspring with the disease could also aid in identifying a new aberrant mutation contributing to this disease.

Have you had a Staffordshire Bull Terrier with unexplained bleeding and a prolonged APTT? Please contact Dr Maddie Roberts at Sydney University (Maddie.roberts@sydney.edu.au).

References

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Hairball Conundrums

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Hairballs are a common problem in long-haired cats and owners often think it's normal. Is there more to it?

Unfortunately, there's little published evidence assessing the frequency of hairballs in cats. One owner survey found 10% of apparently 'normal', domestic shorthaired cats vomit hairballs compared to 20% of domestic longhaired cats (Cannon, *JFMS* 2013). In studies of feral cats, urban free-living cats and zoo cats, hair ball prevalence was low although some urban free-living cats had hair in their stomachs on necropsy.

Grooming is a normal feline behaviour and the feline tongue is adapted with keratinous barbs, which encourage ingestion of fur when grooming. On average, a domestic shorthair cat loses 28 g of hair per kg bodyweight annually, with 75% of this hair being ingested and found in stools (Hendriks *et al.* 1998). Most cats pass this fur undigested in stools but sometimes hair can accumulate forming trichobezoars. Increased frequency of hair ball production may suggest the cat is ingesting an excessive amount of hair or has an underlying gastrointestinal disorder preventing normal hair elimination.

So what should you do if an owner mentions their cat vomits (or coughs!) hairballs frequently in their annual health check or brings them to the clinic for the problem?

Frequent hair ball production should raise suspicion for excessive hair ingestion due to pruritis (e.g. flea infestation, atopy, hypersensitivity), overgrooming due to pain or a behavioural disorder. Working through these differential diagnoses is sensible e.g. flea combing and discussing ectoparasitic prophylaxis with the owner, followed by considering a diet trial for underlying hypersensitivities.

If a clear region of overgrooming exists (e.g. over the flank), then investigating for pain (e.g. ureteral stone obstruction or spinal disease) could be considered.

The author has seen a cat with left sided ureteral stones whose only symptom was a sudden onset of hair barbering over the left flank. This behaviour resolved with analgesia and subsequent passage of the ureterolith.

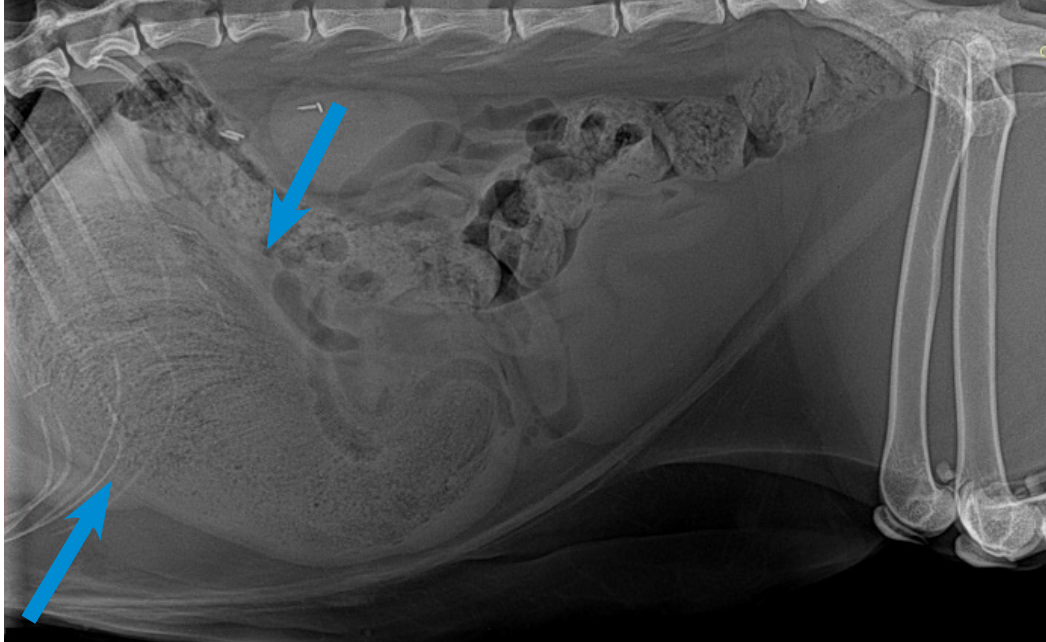


Figure 1. This right lateral radiograph demonstrates an enormous hair ball in the stomach of a Maine Coon with an anxiety disorder resulting in overgrooming of both his own coat and his litter mates' coat. The stomach is entirely filled with hair. The staples in the craniodorsal abdomen are from a previous adrenalectomy.



Figure 2. Hairball - vomited up

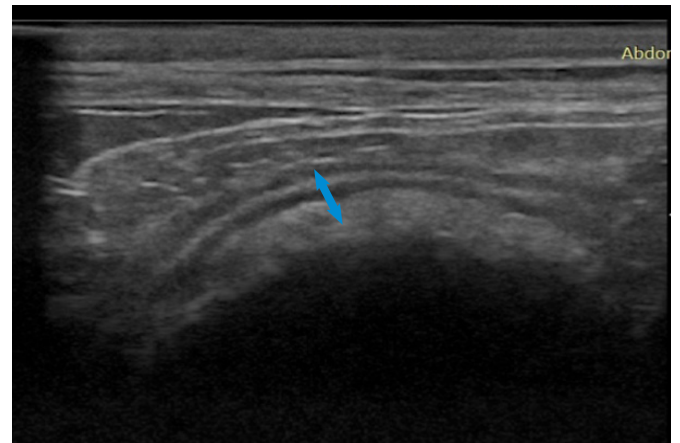


Figure 3. An ultrasound image of the stomach of the same patient above. The blue arrow demonstrates the hyperechoic and shadowing hair filling the stomach. The double headed arrow demonstrates the stomach wall.

Hair balls can also result secondary to altered gastrointestinal motility from chronic GI diseases such as inflammatory bowel disease or dietary intolerance or hypersensitivities. Ileus secondary to increased sympathetic stimulation from chronic pain, stress or dehydration can occur. When diagnosed and appropriately treated, it is not unusual for hairball production to decrease.

It is important to question owners about diet and stool consistency. Physical examination should include assessment of body weight, body and muscle condition scoring and trends reviewed to see if the patient is losing weight or condition. This should prompt further investigations for GI disease if present.

Normal gastrointestinal tract motility depends on finely co-ordinated, contractile smooth muscle activity that forces contents distally (or proximally during vomiting). Contractions occur under the influence of excitatory neurotransmitters (e.g. acetylcholine). A combination of contraction and relaxation mixes, grinds and ultimately results in propulsion of ingesta. There are



Figure 4. This image shows the giant hair ball following gastrotomy for removal. This hairball weighed approximately 320 g. According to the world's best source of information (the internet) the biggest hairball recorded was 12.5 cm wide and weighed 350g.

3 recurring phases of interdigestive activity—namely motor quiescence, irregular contractions and giant contractions. Cats prone to hair balls may have a lack of housekeeper contractions in the stomach resulting in poor gastric peristalsis.

Diet composition affects gastrointestinal motility. High or low fibre content did not appear to affect gastric emptying time; however a larger meal size did, and triangular kibble took longer to clear from the stomach than round kibble despite no correlation with kibble surface area and gastric emptying time. (Armbrust *et al Vet Radio Ultrasound* 2003, Goggin *et al. Am J Vet Res* 1998)

If hair balls reach a size to cause a partial or complete obstruction, these typically lodge in the pylorus or the ileo-caeco-colic junction. Cats subsequently present with inappetence, vomiting and abdominal pain. Oesophageal hair balls (which probably form in the stomach and get caught when being vomited) may cause oesophagitis and strictures but appear less commonly (Squires, *JSAP* 1989).

Hair balls can be identified on diagnostic imaging, particularly when they reach a substantial size. If they are causing a partial obstruction, they are more difficult to identify.

Options to reduce hairball formation

- Diet change
 - Cats with IBD or dietary intolerance may respond to an elimination diet.
 - Anti-hair ball diets have insoluble fibre added and larger kibble size to encourage gastric emptying. Cellulose addition specifically raises faecal hair excretion (Beynen, *All about Feed* 2015). It likely does this through preventing accumulation of hairs in the stomach and increasing transfer of loose hairs into the duodenum and accelerating gastric transit time.
 - There is no evidence that compares the use of dry diets versus wet diets for altering hairball production.
- Grooming
 - Daily grooming (although it is important to remove as much hair as possible rather than just loosen it) or even better, a 'lion clip'
- Encouraging increased gastric emptying
 - Feed smaller meals frequently to help speed up gastric emptying.
- Lubricants
 - These may help prevent the hairs from coalescing into a big ball. Liquid paraffin (in the form of Catalax gel, Laxatone gel or similar) is generally well tolerated, but syringing must be avoided to prevent aspira-



Figure 5. Better out than in. Not from a sheep, but from a 4 kg British Shorthair. I'm still itchy 4 years later.



Figure 6. The patient in question prior to his surgery for hair ball removal. Biopsies were obtained from the stomach, duodenum, jejunum and ileum to assess for underlying GI disease; however, these were unremarkable. The patient is highly anxious and it is likely this has contributed to his overgrooming behaviour. He has responded well to anxiolytic medication and regularly clipping, both of himself and his litter mate.

tion pneumonia. Again, evidence is limited. Richard Malik likes hemp oil (e.g. Hempooch) as an easy and safe way to get lubricant into the stomach; it also provides a nice mix of fatty acids and gives the coat improved gloss.

- Medical management
 - Prokinetic agents (e.g., metoclopramide, cisapride or prucalopride) are rarely required for most cats; however, those with marked dysmotility (e.g., cats with idiopathic megacolon) will benefit from administration and these drugs could be trialed in cats where the frequency of hair balls has not responded to the above management options.