Clinical Commentary

Risk of colic associated with persimmon fruit ingestion

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As noted by the authors of the preceding clinical report (Rodriguez Hurtado et al. 2007), persimmon trees (Diospyros virginiana) are commonly seen in horse pastures in many eastern, southern and mid-western regions of the US. During the late summer and early autumn, the tree produces a spherical shaped fruit that is approximately 3–5 cm in size (Fig 1). The thick outer skin of the fruit is dark green in the summer and slowly matures, past an orange colour to a purplish black-hued fruit in the autumn. At the time of ripening, the calyx consists of a sweet pulpy, amber-fleshed fruit that contains flat, oblong-shaped, pale brown, hard-surfaced seeds approximately 0.5 x 1.0–1.5 cm in size. Most persimmons contain 6–8 seeds per fruit. As the persimmon fruits ripen during the autumn, the characteristic, astringent, sour taste of the fruit also matures to a rich, full sweetness. At this time horses and ponies may engorge themselves on any available sweet fruit.

Persimmon bezoars (‘diospyrobezoars’) account for approximately 75% of all phytozoos recognised in man, world-wide (Dolan and Thompson 1979). Although there is relatively sparse information regarding phytozoos in the veterinary literature, it is well established that, given the opportunity, many mammalian and avian species will engorge themselves on ripe persimmon fruit. The formation of a persimmon bezoar may lead to gastric impaction, gastric ulceration, risk of fatal gastric perforation and, in some instances, small intestinal obstruction.

Most information regarding persimmon bezoars pertains to the human perspective. Interestingly, persimmon bezoar ‘epidemics’ have been described as recently as the early 1980s in Israel (Granot et al. 1984). Increasing incidence of bezoar obstruction in human patients has also been attributed to a growing popularity of the persimmon fruit and, especially, a new persimmon variant containing tannins that coagulate more readily in the gastric environment. Risk of bezoar obstruction associated with persimmon ingestion is greater in human patients with a previous history of gastric surgery (e.g. vagotomy, pyloroplasty and partial gastrectomy), presumably attributable to disturbed gastric motility and delayed gastric emptying. Ingestion of persimmons that are not peeled also increases the risk of bezoar formation and gastrointestinal obstruction by a factor of 56 (Benharroch et al. 1993).

As is the case for horses and ponies, the most common locations for persimmon bezoar obstruction in human patients are the stomach and small intestine. Clinical signs in human patients include mild-to-severe abdominal cramping, nausea, vomiting, pyrexia, melena (resulting from gastric ulceration), diarrhoea and varying degrees of weight loss. A majority of patients report a 3–8 month history of clinical signs prior to diagnosis of the condition. Moreover, symptoms associated with persimmon bezoars tend to recur periodically at varying intervals (Dolan and Thompson 1979). Diagnosis of gastric and small intestinal persimmon bezoars in man is made on the basis of dietary history, characteristic symptoms, radiographic and fluoroscopic contrast studies, and endoscopy. However, in many instances, although appropriate diagnostic tests may have been performed, additional (unanticipated) bezoars are discovered during exploratory celiotomy (Kaplan et al. 1985; Chisholm et al. 1992).

As was the case for the pony in this report (Rodriguez Hurtado et al. 2007), clinical signs associated with a gastric

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Fig 1: Photograph of the American Persimmon (variety Meader) (kindly provided by One Green World, Molalla, Oregon).
persimmon bezoar in equids are similar to those in man and include acute colic with gastric reflux resulting from pyloric outflow obstruction and, in some cases, small intestinal obstruction. We share the experience of the authors inasmuch as some of the horses we have treated for gastric persimmon impactions have presented with spontaneous, orange-coloured nasogastric reflux. In many cases, the clinical presentation is chronic and affected horses are presented for weight loss, episodes of inappetance, and recurring bouts of colic with variable response to conservative treatments. Gastric persimmon bezoars are often identified as incidental findings during post mortem examination. Unexpected death may result from gastrorrhaxis and peritonitis. The clinical signs and chronology associated with development of persimmon bezoars depend on the size and hardness of the resulting mass.

Diagnostic corroboration of a gastric persimmon bezoar is based on endoscopic examination. Although gastric endoscopy is often employed for the diagnosis of chronic colic, it is less frequently used during the management of acute, severe colic. In this case (Rodriguez Hurtado et al. 2007), the owner of the affected pony had observed the ingestion of persimmon fruits, providing valuable insight into the likely cause of colic. Indication for gastric endoscopy was further supported by the presence of spontaneous gastric reflux and ultrasonographically evident gastric distention in the absence of other evidence for obstructed small intestine (based on results of ultrasonography and palpation). It is very important to specifically enquire about possible access to persimmon fruit when faced with horses and ponies affected with colic because horse owners (and veterinarians) often do not recognise that persimmon ingestion may lead to bezoar formation and colic. The risk of colic associated with persimmon ingestion is greatest in the autumn and early winter months in the mid-west.

As noted by Rodriguez Hurtado et al. (2007), some aspects of the clinical presentation were not readily explained by the simple presence of a single bezoar in the pony's stomach. Based on our experience, the severity of cardiovascular compromise in this case, appeared to be atypically severe. Of note in that context, both the severely elevated plasma lactate concentration and level of dehydration were implicated for an unfavourable prognosis. In our experience, bezoar-associated gastric outflow obstruction patients develop metabolic alkalosis as a result of sequestration and loss of gastric fluid. In this case, it appears that significant cardiovascular deterioration superseded the primary alkalotic process and led to metabolic acidosis resulting from compromised peripheral tissue perfusion. It remains possible that a fragment of the gastric bezoar had passed into the small intestine and caused transient obstruction that had resolved by the time the pony presented for diagnostic tests.

Conservative treatments for human patients with gastric bezoars have included gastric lavage, enzymatic therapy including papain with sodium bicarbonate, cellulase and Adolph’s Meat Tenderizer, or enzymatic therapy combined with endoscopic fragmentation and removal (Nelson 1980; Moriel et al. 1983). Successful bezoar removal via endoscopic fragmentation was originally described by McKechnie (1972). However, transendoscopic fragmentation may cause components of the bezoar to move into the small intestine and cause further obstruction (Chisholm et al. 1992). Review of the human literature has previously pointed to the need for surgical intervention in the majority of confirmed gastrointestinal persimmon bezoars (Krausz et al. 1986). Although rarely reported, gastric persimmon bezoars may be surgically extracted from the equine stomach (Kellam et al. 2000). However, gastrotomy in adult equine patients is technically difficult and associated with risk of post operative complications such as peritonitis.

It is important to note that the need to withhold food from colic-affected equine patients, especially those in which gastric obstruction associated with persimmon bezoar formation is suspected, may cause hyperlipaemia (Dunkel and McKenzie 2003). The risk of clinically significant hyperlipaemia is high in obese ponies, such as that described in this clinical report. Hyperlipaemia results from the combined effects of lipid mobilisation in an obese animal, negative energy balance (withholding food), stress (hypercortisolism), and genetically-determined insulin resistance in some pony breeds (Treiber et al. 2006). If not addressed, severe hyperlipaemia may lead to hepatic lipodystrophy and death (Dunkel and McKenzie 2003). The plasma triglyceride concentration was only mildly elevated when the obese pony described in this report was presented to the authors. As a part of the pony's treatment, glucose was added to the i.v. fluids and, eventually, sucrose was administered through a feeding tube. Monitoring of the plasma triglyceride concentration was initiated and the mild hypertriglyceridaemia resolved.

Demonstration that persimmon bezoars in the stomach of human and equine patients may be successfully dissolved by the oral administration of carbonated cola drinks represents a novel and useful treatment that may preclude the need for surgical intervention. Veterinarians should certainly consider administering Coca-Cola™ via nasogastric tube to equine patients when signs of acute colic might be attributable to persimmon bezoar obstruction; such treatment could be initiated prior to referral for endoscopic diagnosis.

References


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