Radiographic Appearance of Common GI Foreign Bodies in Dogs and Cats

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Vomiting and anorexia are common clinical presenting complaints in dogs and cats. While recognizing radiographic signs of mechanical obstruction of the intestines is an important skill (see https://www.mspca.org/angell_services/identifying-mechanical-obstruction-on-radiographs/), it can also be important to be able to recognize characteristics of identifiable foreign bodies on plain radiographs. These foreign bodies can often be identified even without concurrent obstruction, and monitoring with serial radiographic studies can either demonstrate positive confirmation of obstruction or confirm passage of the foreign body into the colon. This article provides examples of radiographically detectable foreign bodies in dogs and cats.

Rubber

Rubber objects are usually radiopaque, often of a mineral opacity if they are large enough pieces. This can be useful when there is known or suspected ingestion of specific rubber foreign material such as hair ties or tennis balls. Radiographs can be a very simple yes/no test in these scenarios, as the rubber material should be reliably visible in the abdomen if it is present. Rubber balls are often hollow and may appear as complete or semi-collapsed mineral opaque circles with gas-filled centers (Figure 1, red and green arrows). Tennis balls are typically chewed into fragments before swallowing and will often appear as curvilinear mineral objects, often with jagged edges (Figure 1, yellow arrows).

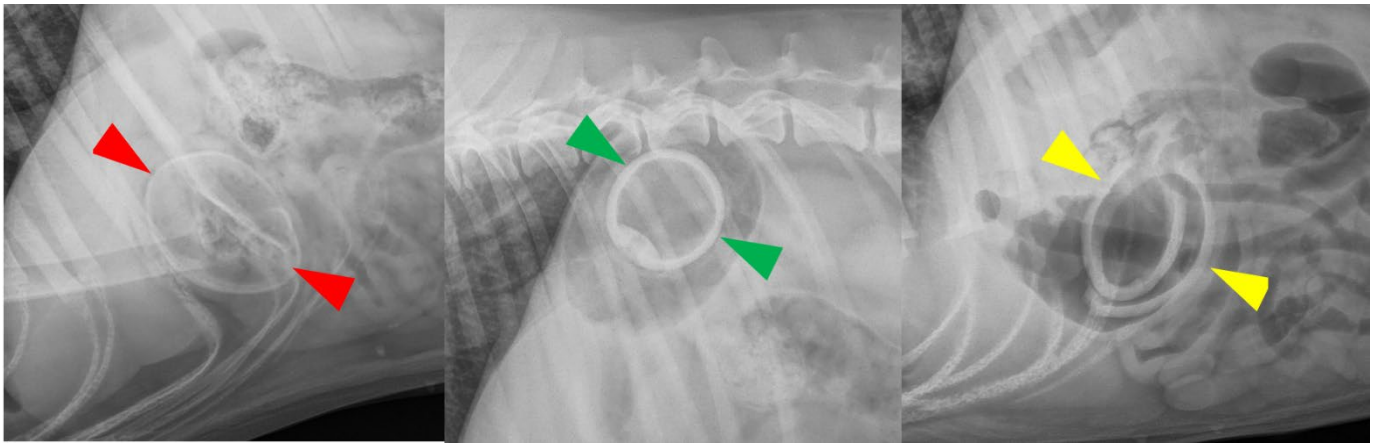

Figure 1: *Collapsed (red arrows), intact (green arrows), and fragmented (yellow arrows) rubber ball foreign bodies in three different dogs.*

Rubber bands (e.g., hair ties) are also commonly ingested, especially by cats. Like rubber balls, these are almost invariably detectable radiographically, usually as linear mineral opacities that may or may not form complete rings (Figure 2).

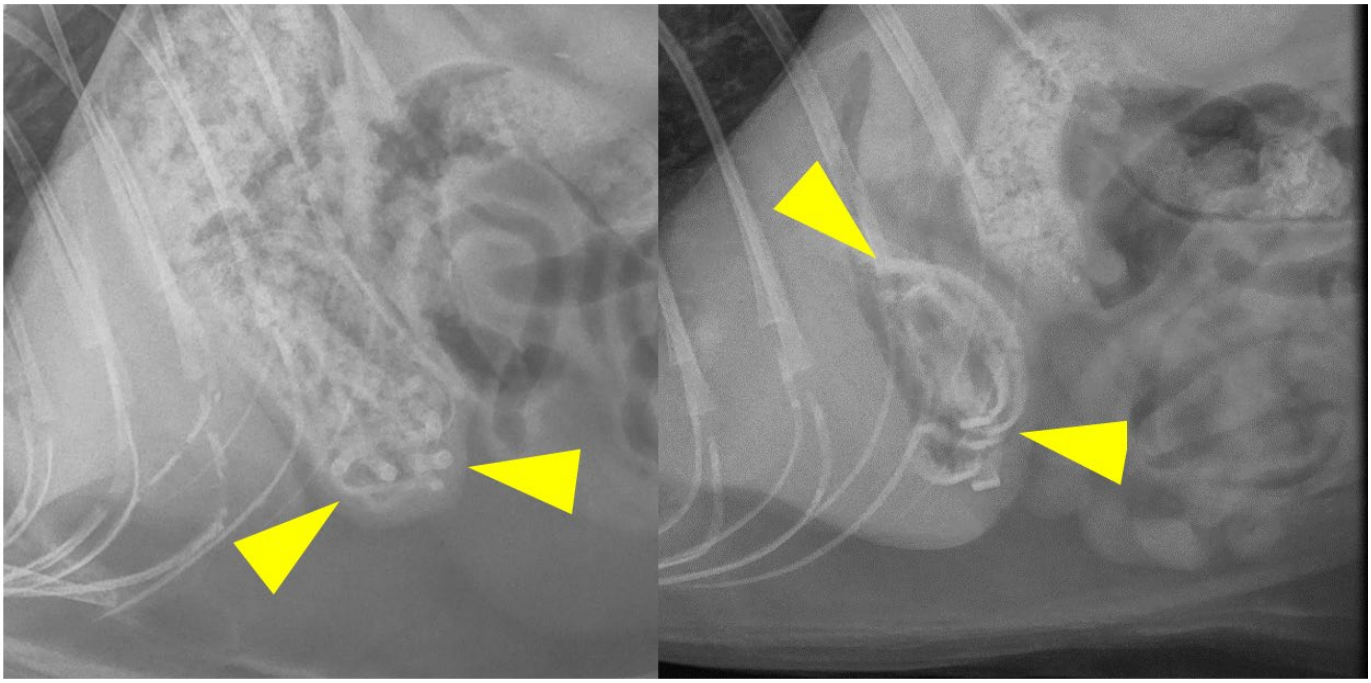

Figure 2: *Rubber band foreign bodies (yellow arrows) in the stomachs of two different cats.*

Corn Cobs

Corn cob foreign bodies are common and frequently obstructive in dogs, especially during fresh corn season (summer to early autumn). If the dog chewed the corn cob into small pieces, they would likely be unidentifiable as corn cob, essentially looking like normal ingesta (and likely not clinically significant). But if the corn cob segment was partially or fully intact when swallowed, it may be readily visible on radiographs. The most common appearance of a corn cob is of a rectangular or cylindrical object of mixed soft-tissue and gas opacity, with a pattern of stippled gas regularly spaced in a grid that corresponds to the distribution of corn kernels on the cob (Figure 3). The "sockets" that hold the corn kernels will entrap gas, creating this regular grid pattern radiographically.

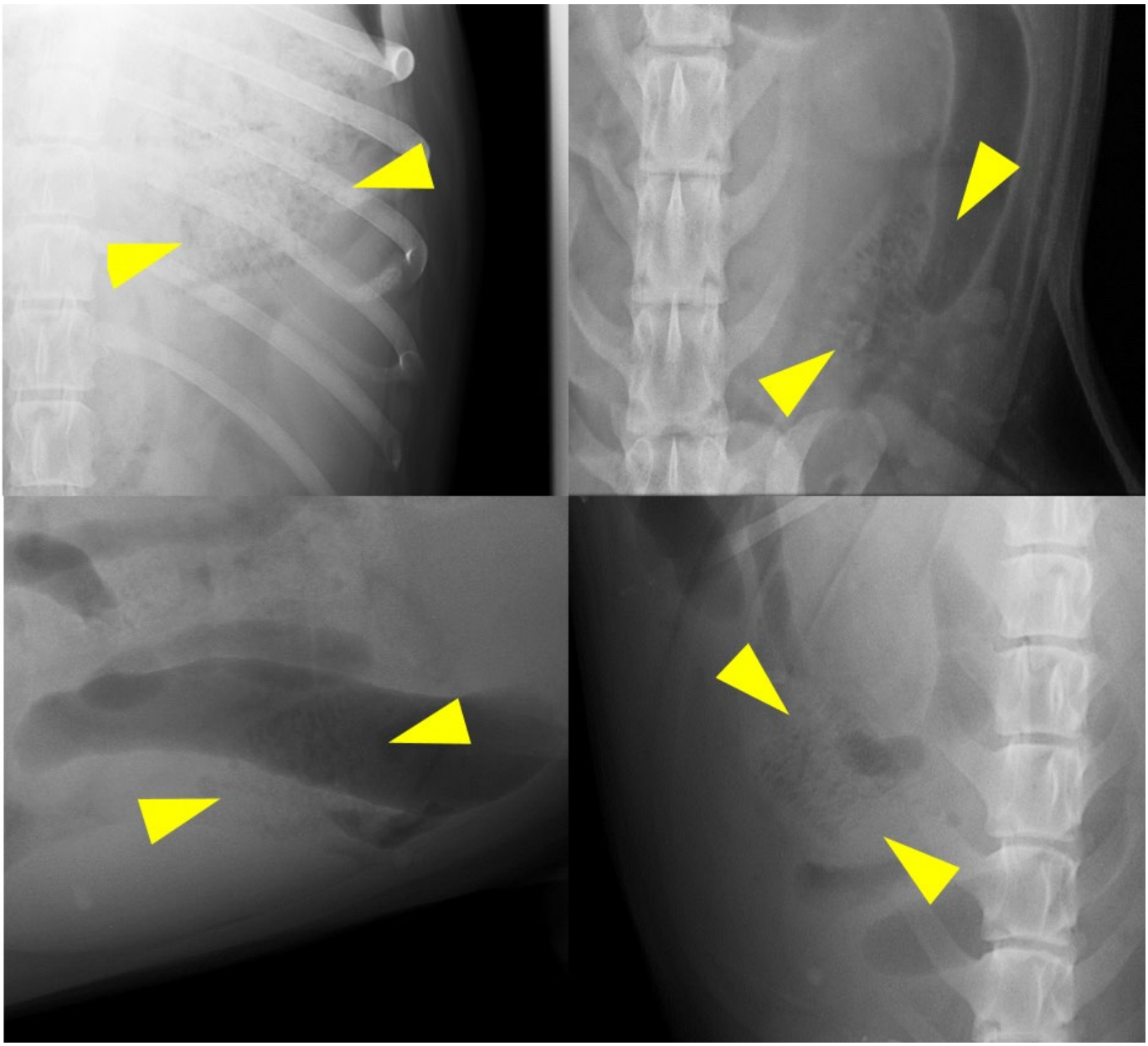

Figure 3: *Small intestinal corn cob foreign bodies in three dogs (yellow arrows). The bottom two images are from the same dog. Note the regular grid-like pattern of stippled gas, characteristic of corn cobs.*

Stone Fruit Pits

The pits from peaches, plums, apricots, and other similar stone fruit have a characteristic appearance radiographically. They are almond-shaped mixed opacity objects, usually with a gas lucent center and soft tissue to a mineral opaque wall (Figure 4). The wall of the fruit pit is only faintly mineral in opacity. When surrounded by fluid, it can be a very subtle lesion as the gas lucency in the center can resemble normal intestinal gas. The ridges of the pit can also create linear opacities over the gas center, creating a slightly striated appearance.

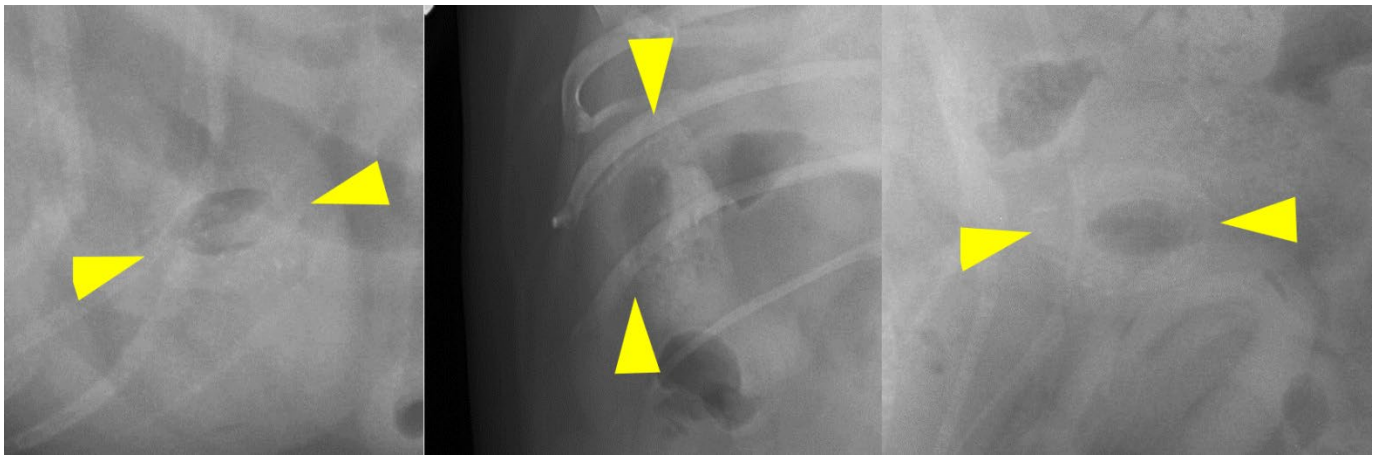

Figure 4: *Peach pit foreign bodies in three different dogs (yellow arrows). Note the faintly mineral opaque walls forming an almond shape surrounding a central gas lucency.*

Tree Nuts

Although somewhat uncommon as obstructive foreign bodies, certain tree nuts with strong shells or coats, such as chestnuts, walnuts, pistachios, hazelnuts, and acorns, can be radiographically visible. These tend to be more challenging to identify, as they do not have a gaseous or hollow center, unlike stone fruit pits. The nut meat is usually of a soft tissue opacity, and the shell is usually also of a soft tissue opacity. But some gas can be present between the nut meat and the shell, creating a distinct outline of the foreign body (Figure 5).

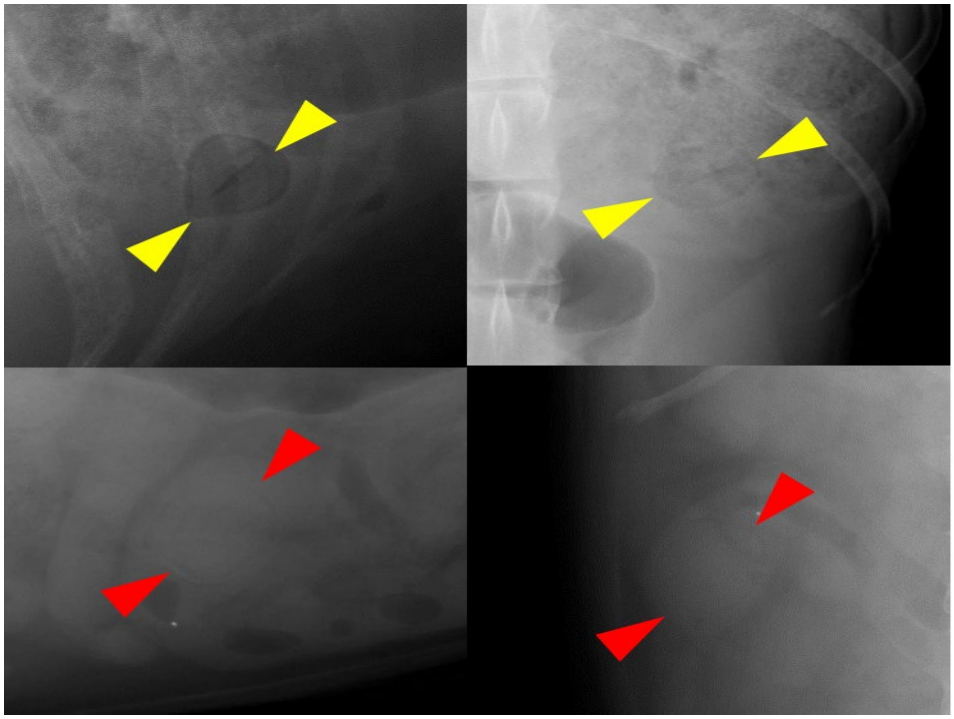

Figure 5: *A chestnut foreign body in the stomach of a dog (yellow arrows) and an acorn foreign body in a dog's small intestine (red arrows). Note the rim of gas surrounding the nut meat within the shell. The gas is relatively thin and subtle in the acorn.*

Fabric

Fabric foreign material, such as articles of clothing or fragments of towels and sheets, generally are of a soft tissue opacity with numerous characteristic striations that distinguish it from normal ingesta (Figure 6). Fabric foreign material may or may not have associated intestinal plication, depending on whether frayed threads create a concurrent linear component. The fabric can also mimic formed feces in the colon, as there is often some amount of entrapped gas and a somewhat amorphous, tubular shape.

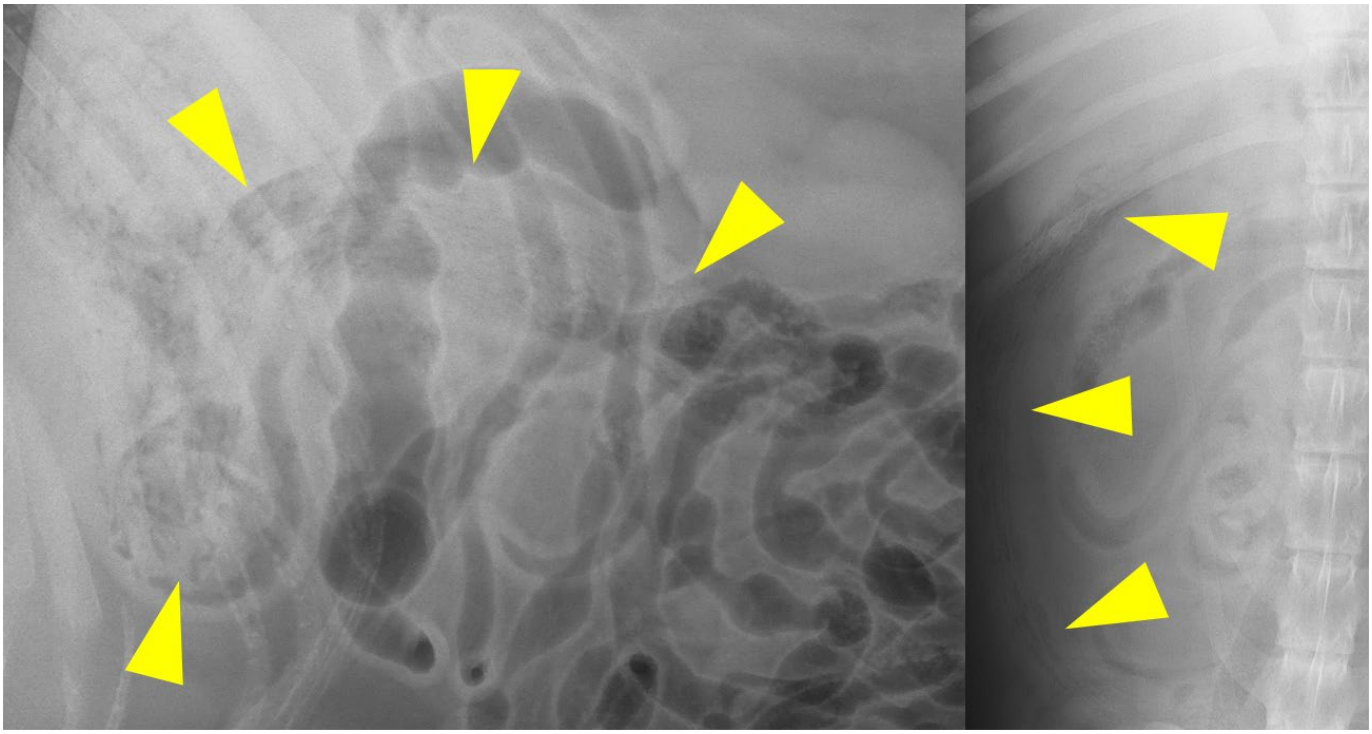

Figure 6: *A sock foreign body in the stomach of a dog, extending into the duodenum (yellow arrow). Note the characteristic striations identifying the foreign material as having a fabric composition.*

Trichobezoars

Trichobezoars, or hairballs, can be obstructive in cats, especially cats with an underlying diffuse enteropathy such as inflammatory bowel disease or small cell alimentary lymphoma. While hairballs are more common in long-haired cats, they can also form in short-haired cats. Trichobezoars can be very challenging to positively identify on radiographs, as they have an amorphous and fairly nondescript appearance. But they are characterized by a somewhat stippled gas pattern within an otherwise discrete small intestinal soft tissue opacity (Figure 7).

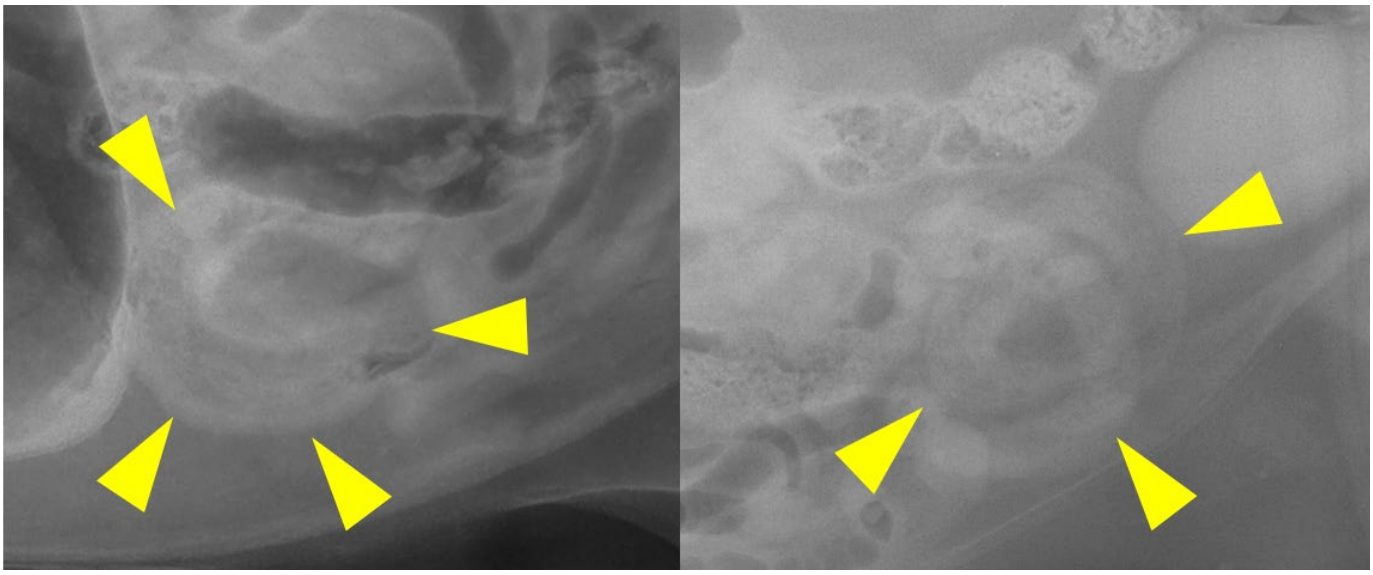

Figure 7: *Jejunal trichobezoars in two cats (yellow arrows). Note how both hairballs are amorphous and conform to the shape of the intestinal lumen. Both have a mixed soft tissue/gas opacity and have a fairly subtle appearance which could easily be confused with fecal material in the colon.*

They are essentially indistinguishable from formed feces in the colon and are generally not identifiable in the stomach. When the hairball can be isolated to a small intestinal segment, separate from the colon, the index of suspicion based on plain radiographs can be quite high. Anecdotally, trichobezoars are more likely to pass with supportive care and IV fluid therapy than other obstructive foreign bodies.

Bismuth Subsalicylate (Pepto-Bismol)

Although technically not a foreign body, it is notable that due to the bismuth, which is a metallic element with an atomic number of 82, Pepto-Bismol and other bismuth-based gastroprotectants will have a radiopaque appearance, generally of a mineral or metal opacity (Figure 8).

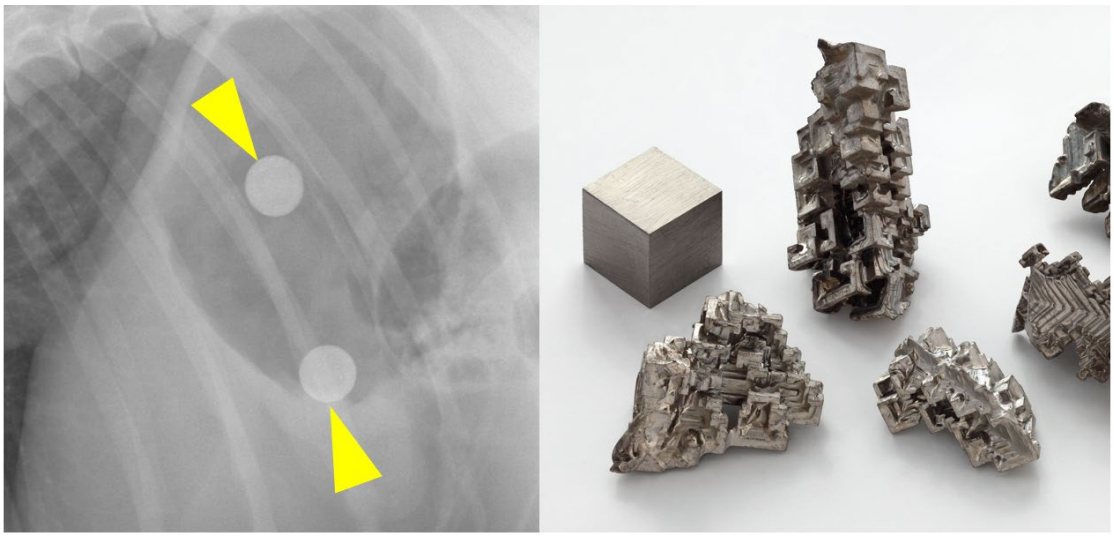

***Figure 8: Left** - Bismuth subsalicylate (Pepto-Bismol) tablets in a dog's stomach. **Right** - Synthetic bismuth metal crystals (source: Wikipedia).*

This usually only becomes clinically relevant if a client has administered the medication in tablet form and did not inform the veterinarian. In liquid form, the bismuth rapidly dilutes and may simply look like a small amount of non-obstructive granular mineral material. But as an intact tablet, Pepto-Bismol very much resembles a foreign body. Reports show that sucralfate can have a similar radiopaque appearance (again, when given in tablet form) as it is an aluminum salt. Still, anecdotally I have never seen sucralfate be confused for foreign material on a radiograph. Aluminum has a much lower atomic number (13). It has a mineral opacity on radiographs, and the amount of aluminum in sucralfate is small enough that it typically is not radiographically visible.

Summary

Although this article demonstrates the characteristic radiographic appearance of some common gastrointestinal foreign bodies in dogs and cats, it is important to note that the presence of an identifiable foreign body does not automatically equate to an indication for surgical exploration. Many non-obstructive foreign bodies, even if obstructive, may pass with supportive care, including IV fluid therapy. But being able to recognize a foreign body radiographically (especially more subtle ones like tree nuts or trichobezoars) can aid in recommending follow-up imaging, given that the foreign body is detectable on plain radiographs. Note that orthogonal projections (ideally right lateral, left lateral, and ventrodorsal) are still recommended with radiographically visible foreign bodies, as sometimes the superimposition of the various intestinal segments may obscure the foreign body on any single view.