ENTEROLITHS: A ROCK AND A HARD PLACE

Enteroliths are one of the leading causes of severe colic in the state of California. The word enterolith is derived from the Greek terms “entero" meaning intestinal and “lith” meaning stone (Figure 1). The high incidence of enterolith formation in California is presumably due to the mineral content of our hay and water. Commonly referred to as stones, enteroliths are composed of struvite crystals which coalesce around some central object like a pebble or a small piece of wire ingested by the horse. When you cut an enterolith in half, you can frequently visualize a central body with rings of mineral deposits around it resembling rings in a tree trunk (Figure 2). The stones can be small and passed unnoticed in the manure or large enough to cause life threatening obstructions. The largest one I have seen was the size of a basketball. When they are round in shape, it usually means they are the only enterolith present, when several stones are adjacent to each other, they often become pyramid shaped by rubbing against each other.

Enteroliths are a very important cause of colic in California and several other states. All the precursors of the struvite crystals (Magnesium, Ammonium & Phosphate) are readily abundant in our water as well as our hay. It is widely recommended to limit alfalfa hay to 50% or less of a horse’s roughage because horses fed predominantly alfalfa hay are statistically more likely to develop stones than other horses. While enteroliths have been found in most breeds of horses, there is a breed predilection for Arabians and Morgans. The classic presentation for a horse with an enterolith in many practices would be a 10 year old Arabian horse fed predominantly alfalfa hay with a history of multiple colic episodes.
Enteroliths take approximately 2 years to form a sufficient size to cause an obstruction. Therefore, horses with small enteroliths may or may not exhibit colic signs. In many cases, there is a high index of suspicion based on breed and diet history. Because the stones can move within the large intestine, they can cause an obstruction with resultant build up of feed and gas causing pain, and then roll back out of the way allowing gas and feed to pass. When this happens, horses can have several episodes of mild to moderate colic over a relatively short period of time. In horses with suspected enterolithiasis, abdominal X-rays are the most likely route to a diagnosis. In a horse held off feed for 12-24 hours, enteroliths will be identified on abdominal radiographs greater than 80% of the time (Figure 3).

Enteroliths too large to pass in the manure must be removed surgically. Almost every year, the most common cause of emergency abdominal surgery in California is stone removal. Counter-intuitively, the worst form of the disease is not the largest stones. A baseball sized stone that has passed from the large colon into the small colon causes more problems than their larger counterparts which are too large to leave the large colon. Baseball sized enteroliths can cause 100% obstruction and severe pain. If left untreated, the small colon can rupture causing peritonitis and resulting in death of the horse. Generally colic surgery for the removal of an enterolith has a very good prognosis. Greater than 90% of horses undergoing colic surgery for enterolith removal will survive and go back into full work.

However, enteroliths which have moved into the small colon have a somewhat worse prognosis for surgical correction than their large colon counterparts. Unlike the small colon, almost the entire large colon can be exteriorized (lifted out of the abdomen) during surgery, allowing stone removal to be accomplished in an isolated...
area. This minimizes the chance of contamination of the abdomen with intestinal contents.

Prevention of stone formation can be best accomplished by limiting the amount of alfalfa to less than 50% of the diet, housing horses in an area not known for stone formation, and attempting to acidify the diet. One cup of Apple Cider vinegar fed twice daily is commonly used in an effort to lower the pH of the large intestine to decrease the likelihood of stone formation. Additionally, a new product Restore® claims to be effective at reducing enterolith formation and possibly even an alternative to “dissolving” enteroliths in horses with stones not requiring immediate surgery.

Figure 1. Enteroliths of various shapes and sizes.
Figure 2. Enteroliths showing how crystals form around a central object.
Figure 3. Abdominal radiograph showing a large enterolith.

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