Research Continues into Colic Causes

In one of many recent difficult telephone conversations, I attempted to console an owner: "I am sorry but there is no hope for survival. Perhaps if we had been able to operate earlier. . . ." So ended the life of a nine-year-old thoroughbred broodmare, succumbing to a complete large colon torsion.

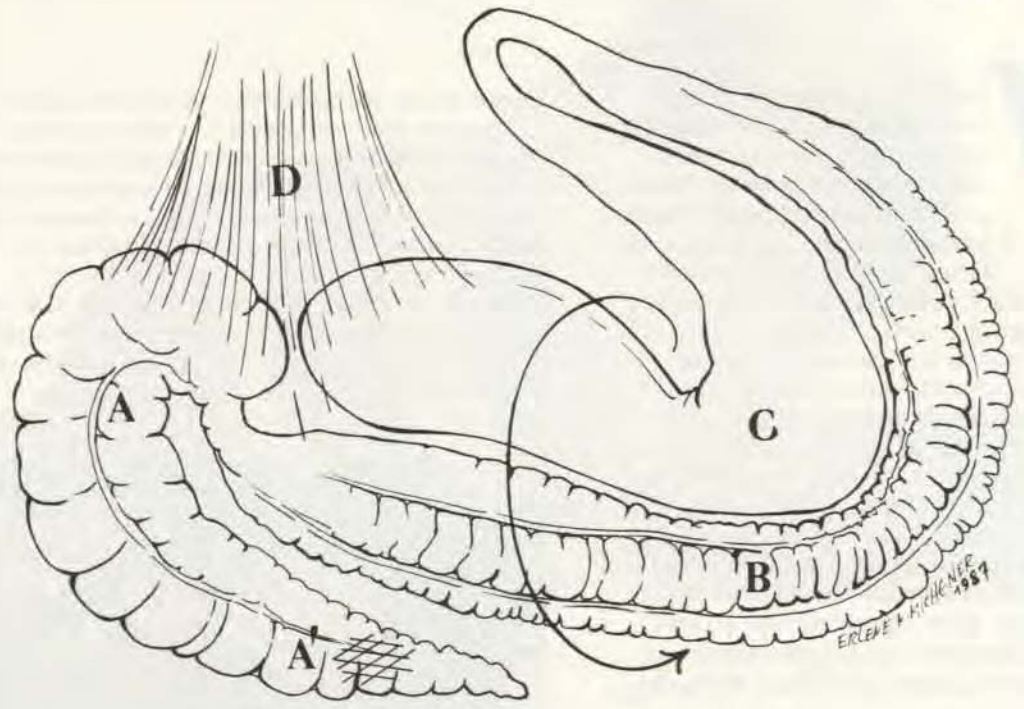
The word colic can cause mild panic in horsemen. Deaths from colic are caused by a number of diseases, ranging from inflammation of the intestinal tract (enteritis) to the more common abdominal accidents, including torsions and displacements. Colic is the number one cause of death in horses. In fact, a recent informal survey of three equine insurance adjusters indicated that mortality claims due to colic may outnumber deaths from other causes as much as two to three times. Certainly, millions of dollars are lost annually due to colic.

A recent overview of colic cases presented to the George D. Widener Hospital for Large Animals at the New Bolton Center campus of the University of Pennsylvania School of Veterinary Medicine revealed an increase in the number of horses admitted for colic due to problems associated with the large intestine. Consequently, one aspect of colic research at New Bolton Center has focused on studying motility in the major components of the large intestine, the large colon, and cecum.

A brief look at the anatomy of the large colon reveals that Mother Nature has not been kind to the horse. Only a small portion of the colon is attached to the horse's body wall, leaving approximately 12 to 15 feet of the bottom (ventral) and top (dorsal) colons free to move and twist on themselves.

A feed change from hay to lush pasture or a heavy parasite load, therefore, may be enough to cause a change in the movements of the colon, called motility, which may result in the accumulation of feed material or gas. Gas distension of the ventral or dorsal colons can cause rotation or torsion, most commonly in a clockwise direction, resulting in blockage of the blood supply, irreversible shock and, in a matter of hours, death. One particularly deadly form of colic, known as large colon torsion or volvulus, occurs frequently in broodmares around foaling time.

Research at Penn's School of Veterinary Medicine on the normal motility of the large colon and cecum has led to the identification of a possible "electrical pacemaker" area in the wall of the cecum. The pacemaker, wandering over an 8- to 12-inch area of the cecal wall, generates this important motility pattern which enables digested food to leave the cecum and enter the ventral colon. This motility pattern, or motor event, is a coordinated series of intestinal muscular contractions which actually forces food material from the cecal body around the base and into the ventral colon.



The horse's large intestine is composed of the cecum (A) and the ventral (B) and dorsal (C) colons. The colon is only attached in a small area (D) to the dorsal body wall and can freely rotate (arrow) if impacted or distended with gas. An electrical pacemaker area (shaded) has been identified in the cecal body (A').

Abrupt feed changes or damage to the cecal vessels due to blood worm, *strongylus vulgaris*, may interrupt the pacemaker and slow or stop movement of feed material from the cecum. Researchers think that the important motility pattern continues around the ventral colon to the pelvic flexure region and may be responsible for the movement of food material in the colon as well.

The effects of therapeutic agents on motility of the cecum and the colon also must be thoroughly investigated. In preliminary studies at New Bolton Center, one such agent, known as neostigmine, has shown a potential for stimulating or increasing the motility of the cecum and colon. Studies also revealed that another drug, xylazine (Rompun), often used as a sedative when treating horses with colic, actually slowed down or stopped intestinal motility for up to 30 or 45 minutes.

Based on results of these studies, new surgical procedures have been developed at New Bolton Center for horses with cecal impactions. For instance, in one procedure known as cecocolic anastomosis, a new channel is created for impacted food material to exit the cecum. Fourteen of the 16 horses presented to Penn's Widener Hospital with cecal impactions have been successfully treated with this procedure. Previous modes of treatment for the problem have resulted in a success rate of approximately 50 percent. Depending on the availability of funding, future research at Penn's New Bolton Center campus is planned to determine the changes in motility caused by gestation and foaling and how management changes might prevent fatal large colon problems.

Until more is known about normal large intestinal motility and the effects of various conditions on it, what can horsemen do to prevent fatal colic? Avoidance of abrupt diet changes and maintenance of an excellent overall parasite control program (including reduction of exposure to parasites and timely administration of deworming medications) appear to be helpful.

Recognition of serious forms of colic in a horse, however, is critical to the animal's chances for survival. For instance, horses which show continuous or severe abdominal pain are more likely to have life-threatening problems. Other signs of a more severe form of colic include elevation of the heart or pulse rate from the normal 40 beats per minute, an increased respiratory rate, sweating, blanching or reddening of the mucous membranes, and increased capillary refill time and dehydration. Horses with large colon torsion may show the above signs as well as abdominal distension or bloating and reduced intestinal sounds heard by listening with a stethoscope. When any of these signs are evident, immediate veterinary assistance should be sought.

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