

Differential Diagnosis of the Right Sided "Ping"

Bruce L. Hull, D.V.M., MS

Department of Veterinary Clinical Sciences
The Ohio State University, Columbus, Ohio 43210

When an auscultable "ping" is discovered on the right side of a bovine animal during physical examination, extreme care must be taken in evaluating its significance. Although the "ping" should be considered abnormal, it is not always an indication of a surgical condition. Conversely, it may be a life threatening condition requiring immediate surgical intervention.

The usual causes of a right sided "ping" are: 1) right displacement of the abomasum, 2) abomasal torsion, 3) cecal torsion, 4) gas in the abdominal cavity, 5) duodenal gas, and 6) colonic gas. Of these, the first three are generally considered surgical diseases and the last 3 are generally medical conditions.

History

The history may be helpful although never diagnostic in the differentiation of right sided "ping". Duodenal gas or colonic gas is often associated with an indigestion or toxic state, such as a coliform mastitis. Although gas in the abdominal cavity is usually secondary to surgery, it may occasionally be caused by a peritonitis. Thus the history of surgery in the preceding week may be helpful in achieving a diagnosis.

Right displacement of the abomasum has the same history as a left displaced abomasum: recently fresh, off feed especially grain, ketosis and varying fecal consistency. Unfortunately, an abomasal torsion may have the same history. Usually with a torsion there is an additional history of a sudden worsening of the condition which would be indicated by 1) abdominal pain, 2) uneasiness, 3) completely off feed, 4) precipitous drop in production or 5) dehydration.

The similar history between right displacement of the abomasum and abomasal torsion can probably be explained by the fact that all abomasal torsions are preceded by a right displaced abomasum. The signs, however, become confusing when one considers that right displacement of the abomasum is transient. It may be present for days before becoming a torsion or it may only be present for a matter of hours. In these briefly transient cases, we often don't have the typical history of an abomasal displacement. Indeed, in these cases we have the history of a more severe crisis as described above. It would be misleading to think that abomasal torsions are painful conditions. Although one

would suspect this to be true, abomasal torsions are usually not painful as compared to cecal torsions or an intestinal obstruction.

Cows seem to have an extremely variable pain threshold. Of the conditions we must differentiate with right sided "pings", cecal torsion is typically the most painful. However, depending on the individual animal, this may vary from a mild uneasiness to severe colic.

Size and Location of the Auscultable "Ping"

In order to evaluate the size of the "ping", one must realize that on auscultation and percussion, both the percussor and the stethoscope must be over the gas filled organ to detect the "ping". Consequently one may outline the size of the "ping" by moving the percussor and the stethoscope over the right paralumbar fossa and rib cage. In doing so, one must mentally note the boundaries of the "ping".

Right displacement of the abomasum is almost always under the rib cage. Although this may extend to the last rib posteriorly, it seldom extends into the paralumbar fossa. The "ping" is usually located high on the rib cage and is normally 8-10 inches in diameter (Figure 1). It is important to note that the "ping" is constant and does not usually move from one place to another.

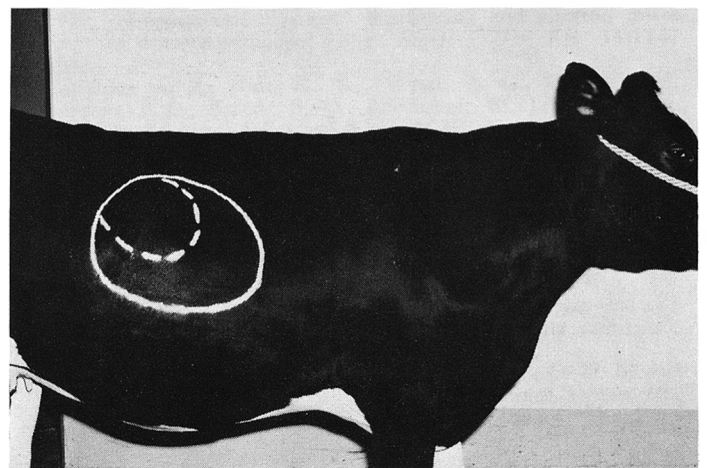


Fig. 1

Abomasal torsion causes a larger percussable area than right displaced abomasum (Figure 1). The "ping" of an abomasal torsion is generally 16-20 inches in diameter. Abomasal torsion may be contained entirely under the rib cage, or it may extend for a variable distance into the paralumbar fossa. Rarely, however, does it fill the entire paralumbar fossa. Torsion may fill the entire area from the paralumbar fossa to the elbow. As the torsion fills with gas, it displaces the liver medially and consequently the area of liver dullness cannot be percussed in an abomasal torsion.

Cecal torsion usually fills the paralumbar fossa and extends for a variable distance under the rib cage (Figure 2). As such, the paralumbar fossa should be distended, not sunken as in the other causes of the right sided "ping". The percussable area usually fills the right paralumbar fossa and extends forward under the caudal area of the rib cage.

Gas in the abdominal cavity is usually bilateral and is located dorsally just below the transverse processes. Rarely does peritoneal gas extend more ventrally than about 3 inches below the transverse processes.

Duodenal gas usually forms a linear gas filled organ which corresponds in location to the duodenum. As such, this gas is generally about 2-3 inches top to bottom and 5-6 inches in length. As this bolus of gas traverses the duodenum, it will move away from the body wall. Hence, a characteristic of duodenal gas is the fact that it is transient or intermittent.

Colonic gas is usually caused by gas in the spiral colon, but can also be caused by gas in the rectum (such as after a rectal examination a cow which fills her rectum with air). Again as with duodenal gas, colonic gas is a small auscultable area (generally 6 inches in diameter or smaller). As this gas progresses through the spiral colon, the gas "ping" is alternately near the peritoneal surface and deep in the abdomen. Hence a colonic gas "ping" typically comes and goes and varies in location. Colonic gas is usually located in the dorsal paralumbar fossa or under the caudal area of the rib cage.

Rectal Palpation

The second most useful tool in clinical evaluation of right sided "ping" is rectal examination. Naturally, an air filled rectum can easily be detected as can air in the peritoneal cavity. Colonic gas or duodenal gas are usually just a small bolus of gas which cannot be palpated.

Of our surgical "pings", right displacement of the abomasum usually cannot be palpated or it is too far anterior. Occasionally these can be touched in a short bodied cow. An abomasal torsion can usually be palpated but not fully delineated. At the far extent of one's reach, a gas filled, firm organ can be palpated in the right dorsal quadrant. However, it is difficult, if not impossible to fully determine the size of the gas filled organ (abomasum).

Conversely a cecal torsion can be readily palpated. In fact, if the blind end is directed caudally it can indeed often be palpated in the pelvic cavity as the typical "Vienna bread"

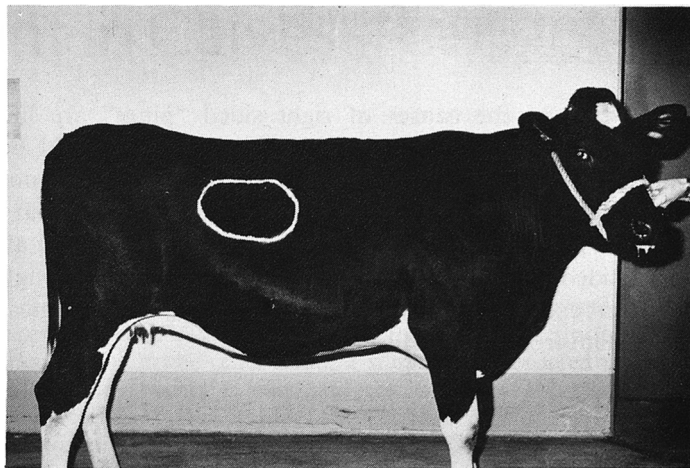


Fig. 2

sized blind end. Even if the blind end is directed cranially, the cecum can be easily palpated and delineated as to its size.

Laboratory Work

Usually a fairly accurate tentative diagnosis can be made on the basis of a physical examination. However, sometimes laboratory work is helpful or needed. The most significant laboratory findings usually concern chloride and blood gases.

The abomasum continually secretes hydrochloric acid. However, as abomasal contents progress down the intestinal tract the H^+ and Cl^- ions are reabsorbed and thus the body balances are maintained. When transit of abomasal ingesta is impeded, the total Cl^- and acid-base balance of the body are altered.

Traditionally an abomasal displacement only slightly impedes the flow of ingesta. Hence the chloride may be slightly depressed (high 90's) but is often normal. However, an abomasal torsion is a total obstruction and the hydrochloric acid secreted into the abomasum is sequestered and not reabsorbed. Consequently the animal becomes hypochloremic and alkalotic. The chloride levels typically would be in the 70's-80's with an abomasal torsion, but may go as low as 40 or 50 in long standing torsion.

As most H^+ and Cl^- ions are reabsorbed in the small intestine, cecal torsion does very little to alter chloride and acid-base status of the animal. The exception to this is when cecal torsion involves the ileo-cecal junction and essentially causes an intestinal obstruction with backup of intestinal contents. In these cases a hypochloremic alkalosis is usually seen.

If physical examination reveals an abomasal torsion and blood gases show an acidosis, this is a grave prognostic sign. In long standing abomasal torsions, the abomasum itself starts to deteriorate, but more importantly the animal is in shock and lactic acidosis supercedes the metabolic alkalosis of the abomasal torsion.

Conclusion

As two of the causes of right sided "pings" are life threatening processes, each right sided "ping" should be thoroughly evaluated. All cases of right sided "pings" are not surgical candidates, as exemplified by colonic gas secondary to toxic mastitis. Hence one must avoid the attitude that all right sided "pings" require emergency surgery. A thorough physical examination will usually differentiate the surgical candidate from the medical case.

Once a right sided "ping" has been determined to be a surgical candidate, surgery should be performed as soon as possible. Both abomasal torsion and cecal torsion are life threatening conditons. While right displacement of the abomasum is not a life threatening condition, it can become an abomasal torsion, requiring immediate surgery, at any time.

Surgical intervention on abomasal torsions has a much higher success rate when undertaken early in the condition. Therefore prompt, thorough evaluation and definitive treatment of all right sided "pings" is essential.