GENERAL PROGNOSIS AND COMPLICATIONS OF RDA

The prognosis for survival and return to productive function with right-sided complications is largely determined by the degree of tissue damage, which is in turn a reflection of the amount and duration of the volvulus. Complications related to tissue damage include those associated with direct tissue damage (abomasal perforation, peritonitis, septicemia, omental tearing) and persistent abomasal neuromuscular dysfunction (decreased or altered abomasal motility, intermittent bloat, dehydration, electrolyte disturbances, poor nutrient absorption, abomasal impaction). Complications related to the surgical procedure itself (redisplacement, malpositioning) are less significant in comparison to those associated with tissue damage but are still important considerations for the surgeon.

Adult cattle with a surgical diagnosis of RDA would be expected to have minimal vascular compromise and a favorable prognosis for short-term survival and return to successful production similar to that for cattle with LDAs. In one of the few studies that used a consistent surgical definition to differentiate between RDA and RVA, 99% of the 218 cows diagnosed with RDA were discharged from the hospital. Of those discharged, the majority (199; 92%) returned to their expected levels in attitude, feed consumption, fecal production, and milk production at the time of discharge. Information on long-term productivity in the herd was not collected in this study and is difficult to reliably isolate RDAs specifically from other studies. Long-term productivity similar to LDAs, if not better is expected because the concurrent diseases

responsible for the majority of LDA losses from the cattle herd are less common in RDAs.

More information on short-term survival and longterm productivity is available for cows with RVA, although the variation in definitions used between and sometimes within, studies suggests the need for caution, particularly when interpreting data from multiple institutions, over extended periods of time, or both. One study reported a 99% short-term survival until discharge for cows with RDA, and 218 of 240 cows (91%) with a surgical diagnosis of RVA survived until discharge, making the inhospital fatality rate 9%. Of the 218 that were discharged, only 147 (71%) were considered to have returned to their expected levels in attitude, feed consumption, fecal production, and milk production at the time of discharge. In another study of 100 surgically corrected RVAs that used a similar classification system, 18% died or were euthanatized before discharge; 14% were discharged but had not met expectations for feed intake, defecation, or milk production; and 68% had returned to expected levels before discharge. A multi-institutional study of veterinary teaching hospital admissions showed an even higher in-hospital fatality rate of 23.5%, with an additional 15.7% of cattle discharged after surgery failing to become productive in the herd. Reported in-house fatality rates from several smaller studies of cows with abomasal volvulus ranged from 24% to 31%. Phone follow-up 1 to 6 months after surgical treatment of 80 cattle with right abomasal volvulus classified 59 (73.8%) as productive, 10 (12.5%) as salvaged for slaughter, and 11 (13.7%) as dead or euthanized by the time of follow-up. The difference in survival rates is significant and must be considered before the decision to proceed with treatment is pursued. Despite the difficulty of preoperatively differentiating

between RDA and RVA in an individual animal, several clinical and biochemical parameters can be used with caution as prognostic indicators. At least one study has shown the following biochemical parameters as predictive of nonsurvival due to death, euthanasia, or slaughter as a result of poor production: preoperative tachycardia (>100/min), dehydration (>6%), hypochloremia (<79mEq/L), hyponatremia, hypokalemia, decreasing base excess, base excess plus serum lactate concentration, base excess plus hypochloremia, increasing anion gap, serum ALP greater than 100 IU/L, and superimposed metabolic acidosis with a high anion gap. Tissue ischemia and necrosis in develop a concurrent metabolic acidosis. As a result, the blood pH returns toward normal, the anion gap increases and the base excess may fall into a negative range. These findings as a group are indicators of an extremely poor prognosis in adult cattle. Surgical findings that may be associated with a poor prognosis include a large volume of fluid in the abomasum that requires fluid decompression and serosal inflammation or necrosis.

Conversely, when cattle with RVA were divided into productive (expected appetite, weight, and milk production) and non-productive (slaughtered for low production, died, or were euthanatized) groups at follow-up 1 to 6 months after surgery, several factors were found to have significant positive predictive value for productivity. These factors included normal hydration status, serum creatinine ≤1.5 mg/dl, serum ALP activity ≤100IU/L, serum Cl ≥95mEq/L, and heart rate ≤80 beats/minute.