# Predicting prognosis of left displaced abomasal corrective surgery

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## Introduction

The incidence rate of left displaced abomasum (LDA) in North America is commonly 3 to 7% of calvings. Of these cases, 12 to 17% are culled or die within 30 days of surgery. There have been numerous studies focused on predicting prognosis for right displaced abomasal corrective surgery; however, fewer studies focus on LDA surgeries. These studies tend to measure only a few parameters (i.e. blood analysis) and none focus on concurrent disease or physical exam at diagnosis.

Croushore et al (2013) reported that cows that were not ketotic at diagnosis (BHBA <1.2mmol/L) were at 2.5 times greater risk of being culled within 30 days than ketotic cows. Various studies have also demonstrated that elevated aspartate aminotransferase, glutamate dehydrogenase, ornithine carbamoyl transferase, bilirubin, urea, Ca, K, and Mg were associated with an increased risk of unfavorable outcomes. The objective of this research was to determine if patient survival (or culling) within 60 days after surgery could be predicted from the physical exam findings, concurrent disease status, and a biochemical profile from a blood sample obtained at the time of LDA diagnosis.

## Materials and Methods

Holstein dairy cow physical exam information, coccygeal blood samples, and concurrent disease status were collected during a triple-blinded, multi-clinic, randomized clinical trial in 2009, investigating the effects of ketoprofen (Anafen; Merial Canada Inc.) on LDA surgery recovery. At the time of diagnosis the cow was given a complete physical exam, a relevant history was obtained, and a blood sample was taken from the coccygeal vein. Blood BHBA concentrations were measured immediately using a hand-held Precision Xtra meter. Data were retrospectively obtained from CanWest DHI for all of the study subjects (n = 179 cases, by 24 veterinarians from 4 clinics), including cull date and reason. Cows were then classified based on culling within 60 days of surgery. Descriptive statistics were performed and univariable models were built between each predictor and the outcome (culled in 60d) was assessed. A final statistical model was then built using forward step-wise logistic regression. Clinic was included to account for clustering.

## Results

There were 6, 11, and 34% of cows with LDA surgery culled within 30 days, 60 days, and 300 days, respectively. Of the study population, 22% of cows were not ketotic at diagnosis and 11% were classified as having dystocia. Based on the final multi-variable logistic regression model for the odds of culling within 60 days (n = 19 cases) following corrective surgery, cows that had a dystocia or were not ketotic (BHBA $\leq$ 1.2mmol/L) at the time of LDA diagnosis were 13 (95% CI: 7-26, P < 0.0001) and 3 (95% CI: 1.03-9, P = 0.05) times more likely to be culled within 60 days than cows with an easy calving or who were ketotic, respectively. These results support the recent findings of Croushore et al (2013). Dystocia had positive and negative predictive values of 37% and 92% for culling in 60 days, respectively. Classification by the BHBA cut-point of 1.2mmol/L had positive and negative predictive values of 14% and 90%, respectively. Other physical exam findings that were associated with culling were heart rate and dehydration score. Dehydration status was positively associated with culling. Heart rate was negatively associated with culling within 60 days. However, neither measure was significant in the final model.

## Significance

Practitioners should obtain a calving history and measure blood BHBA levels to determine if cows are at an increased risk of culling within 60 days of surgery and thus be able to better estimate the cow's surgical prognosis to allow the producer to make a more economical treatment decision.