Use of Ultrasound to Determine the Prognosis of Obstructed Teats

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Introduction

When teat abnormalities occur in dairy cattle, the therapeutic choices vary from "do nothing" to invasive surgery (thelotomy and implant). In many cases, the prognosis is considered poor. It would be useful to have a cow-side method of evaluating the abnormality and predicting the outcome. Radiography is the standard method but is cumbersome as a cow-side tool. This study considers the potential of ultrasound as a practical alternative.

Ducharme, et al classified teat abnormalities based on palpation, the passing of a blunt cannula and radiography.[1] A prospective study involving 51 cows treated surgically concluded that Type I (focal teat cistern lesions that involved less than 30% of the mucosal surface of the teat cistern) and Type V (lesions leading to milk loss through abnormal routes such as lacerations, webbed teats and fistulae) had the best short and long-term prognosis for lactation.[2] We hypothesize that ultrasound will identify those lesions which have a good prognosis.

Materials and Methods

Records of all cattle admitted to the Ontario Veterinary College for the evaluation of the mammary system from September 1990 to December 1998 were reviewed (57 cases). Four cases that did not involve teat obstruction were removed from the data set. Of included cases, 17 were evaluated radiographically, 15 by ultrasound and 21 by both.

For this study, the 21 records containing radiographic and ultrasonographic results were reviewed and abnormalities classified independently. The 2 imaging modalities were then compared. In 1 case, the quality of the ultrasonographic image was inadequate to make a diagnosis. Of the 20 remaining cases, the lesion was classified the same way in 17 of the cases, or 85%. The Kappa statistic for agreement of the two assessments was 0.782.

Results and Conclusion

Of the original data set, 35 cases had ultrasound findings. Lesions could be classified in 33 of the 35 cases. The lesion seen in the other 2 cases did not fit the classification system. The location of the vascular plexus at the teat base appeared to create a dynamic obstruction. This lesion does not appear to have been previously described.

Caution must be used in the interpretation of the data since the sample size is small. However, clinical experience has resulted in contrast radiography largely being discontinued and the diagnosis is made solely on ultrasound evaluation.

The results suggest there is good correlation between radiology and ultrasound in classifying teat obstructions. Also, that it is possible to use ultrasound alone to classify the cases. Assuming that class can predict outcomes, ultrasound could be used to improve the quality of the prognosis.

The actual presentation will focus on the technique and illustration of the various lesions seen with ultrasound.

References

1. Ducharme, NG, Arighi M, Horney D, Livesey MA, Hurtig MA, Pennock. 1987. Invasive teat surgery in dairy cattle 1. Surgical procedures and classification of lesions. *Can Vet J.* 28:757-762.
2. Arighi M, Ducharme, Horney D, Livesey MA, Hurtig MA. 1987. Invasive teat surgery in dairy cattle II. Long term follow up and complications. *Can Vet J.* 28:763-767.