VETERINARY NEWSLETTER

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Dairy

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THE UTAH VETERINARY MEDICAL ASSOCIATION CANYONLANDS VETERINARY CONFERENCE – REMINDER AND SLIGHT PROGRAM CHANGE June 12-14, 2008

There is still time to register for this CE opportunity for Utah veterinarians, including but not limited to dairy and food animal veterinarians. The Utah Veterinary Medical Association Canyonlands Veterinary Conference in Moab, Utah will be held from June 12-14, 2008. The UVMA can be contacted by calling 1-877-882-4862 or electronically at www.uvma.net or uvma@qwest.net. If you have not already received it, I would recommend requesting the brochure that provides conference information including lodging.

Presentations include one by Dr. Warren Hess, State Field Veterinarian, whose presentation will allow attendees to become certified or recertified to participate in the Utah state Johne's Disease/Paratuberculosis control program. This is a convenient way to become certified or to renew certification, and to qualify for the financial incentives to participate in this program.

The following presentations will be during the 10:15 am- noon session on June 13, which is called "UVDL – Case Reports" in the brochure (this is the final schedule, slightly different from before):

Dr. Tom Baldwin – Update from the Utah Veterinary Diagnostic Laboratory

Dr. Kimberly Cavender – Malignant Catarrhal Fever, A Utah case and disease review

Dr. Dave Wilson – Mycoplasma mastitis: statewide prevalence characteristics of infected dairy herds in Utah.

Dr. Jane Kelly – Similarities to African Horse Sickness of a case of malignant hyperthermia following anesthesia

We hope to see you at the meeting.

FACTORS INFLUENCING THE SURVIVAL OF DAIRY COWS AFTER CORRECTION OF LEFT DISPLACED ABOMASUM

By: Keith E. Sterner, DVM; Jorgen Grymer, DVM, PhD;
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The following is a condensed version with commentary of this article, published in the JAVMA 232:10, May 15, 2008. In some places, summary or paraphrasing is contained within [ ] brackets:

The incidence of LDA in dairy operations has substantial economic consequences for milk production, culling, and herd replacements. The lactational incidence rate of LDA is <0.1% to 7% for commercial dairy herds. Strategies have been developed to identify metabolic precursors and reduce the incidence in cows during the peripartum period. Despite these efforts, LDA continues to be a problem, and measures to recognize and treat cows with an LDA should be a part of the management plan for every dairy.

Since LDA in dairy cows was first reported in the 1950s, there have been several methods described for correction. Surgical methods for LDA correction are taught at most veterinary medical schools in North America and Europe. These procedures include [right paramedian] abomasopexy, [left paralumbar fossa] abomasopexy, [right paralumbar fossa] omentopexy, and pyloromentopexy. However, time and economic pressures on large commercial dairies have created a demand for a faster, less expensive means of LDA correction. In 1982, a minimally invasive [roll and toggle] (R&T) procedure of LDA correction was introduced. Since the introduction of [R & T], several authors have reported that the successful outcome for the R&T is comparable to that for the more traditional surgical procedures used for correction of LDA (81% to 93%), but the R&T also provides time and cost savings for producers. [Studies] of laparoscopic repair of LDA have been reported on a limited number of cows. Additional studies are needed to compare these procedures for cost, degree of invasiveness, expense of equipment, and the ability to enable a treated cow to return to profitability.

Historically, diagnosis and repair of LDA have been the sole responsibility of veterinarians. Surgical (laparotomy) repair of an LDA is performed exclusively by veterinarians, and veterinarians also perform most of the R&T procedures used for LDA correction in the United States. However, some dairy producers have [noticed] the simplicity of the procedure and they or their herd personnel have [begun] successfully diagnosing and repairing LDA with an R&T procedure on their own [farms]. To our knowledge, success rates for correction of an LDA by use of R&T procedures performed by herd personnel have not been reported.

The purpose of the study reported here was to identify factors that impacted the survival of cows after diagnosis and correction of an LDA. Specifically, we intended to determine whether use of an R&T or surgical procedure yielded higher survival rates and whether correction by the R&T procedure by trained herd personnel was as successful as correction by veterinarians performing R&T or surgical methods of correction. The primary outcome was defined as survival of a cow in the milking herd (avoidance of death and culling) at 60 days after LDA correction.

Material and Methods

Animals – The study involved 810 cows with an LDA treated by use of an R&T procedure (n=732 cows) or an abdominal surgical procedure (78). The cows were from 76 dairy herds served by a large veterinary practice in central Michigan that provided care for approximately 23,000 Holstein dairy cows. Data for the study were collected during a 1-year period (April 2005 through March 2006). (Comment: this is approximately a 3.5% LDA incidence, relatively low).

Cows were recruited into the study when a veterinarian was requested to come to a farm to examine a cow, an LDA was diagnosed, and corrective procedure was performed. Alternatively, cows were included when diagnosis and correction of an LDA were performed by a trained person on any of the 6 farms in the study [that corrected their own LDAs]. All cows with RDA were excluded. Data [was collected at] diagnosis of an LDA, and follow-up monitoring for outcome was conducted at 14 and 60 days after LDA correction, [including dairy owner participation in a follow-up survey].

Five veterinarians from the veterinary practice participated in diagnosis and correction of LDAs by use of an R&T procedure (group V-R&T) or via abdominal surgical correction (group V-Surg); these veterinarians were also involved in data collection. Additionally, 6 herd personnel from 6 large well-managed dairies also participated in the study. Those people used an R&T procedure for all LDA corrections (group H-R&T). Therefore, treatments (H-R&T, V-R&T, and V-Surg) were not randomly assigned to incident LDA cases. Because the 6 herd personnel could only perform LDA correction by use of the R&T procedure, veterinarians were requested to perform surgical repair of an LDA (23 cows) when there appeared to be complicating factors, [including cows that did not "ping" clearly]. When the veterinarians were already on the dairy performing routine herd health visits and diagnosed an LDA (3 cows), the veterinarians corrected the LDA in those cows by use of R&T.

Dairy producers contributing cows that became part of the V-R&T and V-Surg groups were always given a choice as to the method of correction [of LDA, based on] their past success with a particular method, availability of farm workers [to assist], time constraints, and financial considerations.

Selection and training of herd personnel – At the start of the study, 6 employees from herds contributing cows to the H-R&T group were selected to participate in the study. These 6 herd personnel were selected on the basis of the number of years of experience diagnosing and correcting LDAs, maintaining accurate records, [working] with a large herd (mean 1,130 cows; range 420 to 3,300 cows) that would allow them to achieve a sufficient number of cases, and their willingness to participate.

An R&T procedure with a bar suture was used for all LDA diagnosed and corrected by the 6 herd personnel; [they were] responsible for postsurgical treatment of the cows in the H-R&T group, including treatment for concurrent diseases. Herd personnel had attended college, had a mean of 15 years experience in dairy cow husbandry, or both. Herd personnel had a mean of 9 years of experience (range, 3 to 20 years) correcting LDAs prior to the study, and had learned to diagnose and correct an LDA by participating (observing and assisting) in numerous LDA toggle-suture procedures performed by veterinarians (2 herd personnel) or by other personnel on their dairy (4 herd personnel).

Correction by veterinarians- All cows with an LDA diagnosed and corrected by the 5 participating veterinarians were identified during the daily [practice] routine. After an LDA was diagnosed, options for correction were discussed with the owner-producer, including immediate culling, R&T procedure, or laparotomy. In 4 herds, owners opted exclusively for surgical repair via laparotomy, whereas other herds preferred the R&T procedure on the basis of past experience and [cost]. In instances when a veterinarian believed that a specific procedure represented a strong advantage for a particular cow, this recommendation was communicated to the owner. The owner-producer always made the final decision regarding the type of LDA corrective procedure. Postsurgical treatment of cows in the V-R&T and V-Surg groups, including administration of antimicrobials and treatment of concurrent diseases, was under the direction of the attending veterinarian.

Veterinarians performed the same R&T (V-R&T) that was used by herd personnel (H-R&T). The V-Surg group included [left flank] abomasopexy, [right flank] omentopexy, or pyloromentopexy; choice was the discretion of the veterinarian. Amount of time required for surgical repair was calculated from the initial clipping of hair over the surgical site to the final skin suture. In the case of V-R&T cows, the interval was measured from initiation of restraint to release of the cow following correction.

Data Collection – On the day LDA was diagnosed, a veterinarian or herd person collected [cow] data [using a] data sheet of 35 questions completed and returned to the veterinary clinic. Data included medical history of each cow and management practices of each herd as well as observations made during correction of the LDA. Assessments at 14 and 60 days after correction were collected via telephone interview with the producers (V-Surg and V-R&T groups). For the H-R&T group, initial epidemiologic data and outcome assessments at 14 and 60 days were recorded by herd personnel on the farm data collection sheet and returned to the veterinary clinic for processing.

At the time of LDA diagnosis, preoperative risk was assessed by use of a 5-point scale (5=best outcome and lowest risk, and 1=worst outcome and highest risk) for each cow. Body condition score (scale of 1 to 5, with 1 being thin, 3 being optimal, and 5 being obese) for each affected cow was also assessed before corrective procedures were performed.

A follow-up interview was conducted [after] the study with the 6 herd personnel who performed the H-R&T procedures and with the 7 producers who contributed the most cows to the V-Surg and V-R&T groups. Questions were designed to elicit whether, because they had learned to correct an LDA on their own cows, the H-R&T herd personnel might perform the R&T procedure on some cows that previously would have been culled to avoid paying the veterinary charge for LDA correction. Had this philosophy been adopted, it certainly would have biased interpretation of our results for comparison of survival for the H-R&T and V-R&T groups. A weighted mean annual cull rate for [all herds] was calculated by weighting on the number of cases from each herd.

Statistical analysis – Data were entered into a spreadsheet program by the project coordinator; data were subsequently analyzed by use of a commercial statistical software program. A value of $P < 0.05$ was established as significant. A χ^2 analysis was used to compare categoric variables among LDA correction groups and for survival in the herd at 14 and 60 days after LDA correction. An ANOVA was used to compare

continuous variables among the 3 treatment groups. Herd was included as a random effect, and biologically plausible risk factors that were significant for the bivariable analysis were tested in a stepwise manner, with the method of LDA correction forced into the [logistic regression] model. (Comment: Further statistical methods information is available in the original article or on request).

Results

Correction of LDA was performed for 403 (50%) cows in the H-R&T group, 329 (41%) cows in the V-R&T group, and 78 (10%) cows in the V-Surg group. Risk factors [before, and outcomes] after LDA correction were compared among the 3 treatment groups (Tables 1-3).

Table 1 – Median for continuous variables and range from 25th to 75th percentiles for selected variables for the LDA treatment groups.

Variable	H-R&T (n = 403)	V-R&T (n = 329)	V-Surg (n = 78)	Total (n = 810)	P value*
Body condition score	3	3	3	3	0.135
Age of cow (mo)	42 (27-54)	48 (28-60)	48 (39-60)	48 (28-60)	0.006
Lactation No.	2	2	2	2	0.240
Milk production at time of diagnosis of LDA (kg)	16.8 (9.1-22.3)	13.6 (9.1-20.4)	13.6 (9.1-18.1)	15.2 (9.1-21.7)	0.014
Procedure time (min)	10 (8-10)	10 (8-15)	60 (60-60)	10 (8-15)	<0.001
DIM at time of LDA Diagnosis	10 (7-19)	12 (8-19)	18 (11-39)	12 (8-19)	<0.001
Milk production at 14 days after LDA correction (kg)	27.2 (18.3-33.1)	27.2 (20.4-34.0)	27.2 (20.4-34.0)	27.2 (20.4-34.0)	0.565
Milk production at 60 days after LDA correction (kg)	39.1 (33.3-46.7)	37.6 (29.5-45.4)	36.6 (30.3-42.3)	38.6 (31.8-45.4)	0.152

*ANOVA comparison among the 3 groups; values were considered significant at $P < 0.05$.
Body condition score was graded on a scale of 1 to 5, with 1 being thin, 3 being optimal, and 5 being obese.
To convert kilograms of milk to pounds of milk, multiply value by 2.2.

(Comment: Table 1 shows that veterinary correction was elected for cows that had been fresh longer and were producing less milk than those with H-R&T, and it appears that time for V-Surg must have often been estimated at exactly 60 min).

Table 2 – Number (percentage) for categoric variables associated with parturition events for cows in the LDA treatment groups.

Variable	H-R&T	V-R&T	V-Surg	Total	P value*
Previous LDA					<0.001
No	395 (98)	314 (96)	64 (82)	773 (95)	
Yes	8 (2)	14 (4)	14 (18)	36 (5)	
Birth of live calf†					<0.001
No	56 (14)	17 (5)	2 (3)	75 (10)	
Yes	330 (86)	303 (95)	70 (97)	703 (90)	
Twins†					0.650
No	353 (91)	287 (90)	64 (89)	704 (90)	
Yes	33 (9)	33 (10)	8 (11)	74 (10)	
Assisted birth†					0.210
No	289 (75)	252 (79)	60 (83)	601 (77)	
Yes	97 (25)	68 (21)	12 (17)	177 (23)	

*χ^2 analysis with 2 df. †Refers to events for the current calving.

Table 3 – Number (percentage) for categoric variables regarding concurrent disease at the time of LDA correction among the LDA treatment groups.

Variable	H-R&T	V-R&T	V-Surg	Total	P value*
Abdominal distention					<0.001
Low†	56 (14)	69 (21)	13 (17)	138 (17)	
At last rib	333 (83)	203 (62)	39 (51)	575 (71)	
Caudal to last rib	14 (3)	57 (17)	25 (32)	96 (12)	
Hypocalcemia					0.016
No	389 (97)	306 (93)	74 (95)	769 (95)	
Yes	10 (3)	23 (7)	4 (5)	37 (5)	
Metritis					<0.001
No	339 (85)	199 (60)	56 (72)	594 (74)	
Yes	60 (15)	130 (40)	22 (28)	212 (26)	
Acetonemia					<0.001
No	227 (57)	44 (13)	35 (45)	306 (38)	
Yes	172 (43)	285 (87)	45 (55)	500 (62)	
Mastitis					0.587
No	372 (93)	310 (94)	75 (96)	757 (94)	
Yes	27 (7)	19 (6)	3 (4)	49 (6)	
Lameness					0.164
No	354 (89)	305 (93)	69 (88)	728 (90)	
Yes	45 (11)	24 (7)	9 (12)	78 (10)	

*χ^2 analysis with 2 df. †Low = At or ventral to the costochondral junction.

(Comment: Table 3 shows that distention caudal to last rib, hypocalcemia, metritis, and acetonemia are significantly more likely to be reported for veterinary corrected LDA cases. This may reflect presentation of more diseased cows for possible veterinary surgery, and/or more likelihood that those diseases will be detected when veterinary attention is given).

Table 4 – Mean (percentage) for categoric variables regarding events at or by 14 and 60 days after LDA correction among the LDA treatment groups.

Variable	H-R&T	V-R&T	V-Surg	Total	P value
In herd at 14 d					0.105
No	76 (19)	43 (13)	12 (15)	131 (16)	
Yes	327 (81)	286 (87)	66 (85)	679 (84)	
Culled by 14 d					0.011
No	364 (90)	313 (95)	76 (97)	753 (93)	
Yes	39 (10)	16 (5)	2 (3)	57 (7)	
Died by 14 d					0.445
No	366 (91)	302 (91)	68 (87)	736 (91)	
Yes	37 (9)	27 (9)	10 (13)	74 (9)	
In herd at 60 d					0.044
No	117 (29)	69 (21)	21 (27)	207 (26)	
Yes	286 (71)	260 (79)	57 (73)	603 (74)	
Culled by 60 d					0.001
No	292 (80)	267 (88)	63 (93)	622 (84)	
Yes	74 (20)	35 (12)	63* (7)	114 (16)	
Died by 60 d					0.066
No	320 (88)	277 (88)	60 (79)	657 (87)	
Yes	43 (12)	36 (12)	16 (21)	95 (13)	

See Tables 1 and 2 for key (*63 appeared in original paper, but should apparently be 4 cows)

Factors were assessed for their association with survival of a cow at 14 and 60 days after LDA correction (Table 4). Variables not associated with survival at 60 days included type of repair (abdominal surgery vs R&T), parity, concurrent disease [other than mastitis] or condition (including lameness, metritis,

acetonemia, hypocalcemia, dystocia [assistance with calving], birth of a dead calf, birth of twin calves, and retained fetal membranes), degree of abomasal distention at diagnosis, antimicrobial treatment, number of nonlactating days before onset, satisfaction with the correction, and certainty of correction at the time of surgery or R&T. (Comment: Table 4 shows that culling was more likely at 14 and 60 days post-surgery for H-R&T cases, least likely for V-Surg cases. However, a cow dying by both time points was more likely among V-Surg cases, though not statistically significant. This may reflect the risk of peritonitis or other complications of abdominal surgery, and/or that V-Surg cases had highest estimated preoperative risk).

Median values for preoperative risk were 5, 4, and 3 for the H-R&T, V-R&T, and V-Surg groups, respectively. This distribution differed significantly ($P < 0.001$; χ^2 test; 2 df), which indicated that cows in the V-Surg group were judged to have had the highest preoperative risk. Concurrent mastitis, age, and history of a previous LDA were associated with a cow's survival in the herd at 60 days after LDA correction. Thirty of 49 (61%) cows with concurrent mastitis were still in the herd at 60 days, compared with 569 of 757 (75%) of cows without mastitis (P=0.030). Younger cows were significantly (P=0.032) more likely be in the herd at 60 days. Nineteen of 36 (53%) cows with a previous LDA remained in the herd at 60 days, compared with 583 of 773 (75%) cows that had not previously had an LDA (P=0.002).

The proportion of cows in the milking herd at 14 and at 60 days after LDA correction were compared among farms for the H-R&T group and among veterinarians for the V-R&T group (Table 5). There were significant (P=0.033) differences at 60 days among the H-R&T herds. One of these H-R&T herds contributed the most cows to the study for the H-R&T group and also had the lowest rates of survival among the H-R&T group. Rates for remaining in the milking herd after LDA correction differed significantly among the veterinarians at the assessments on days 14 (P=0.002) and 60 (P=0.040). (Comment: Those performing the most LDA R&T did not necessarily have greater associated success; in fact, among the herd personnel there was a trend that those performing the fewest had the best outcomes).

Survival rates on day 14 differed significantly (P=0.035) between V-R&T (87%) and H-R&T (81%) groups, [as did those] at day 60 (P=0.013) between the V-R&T (79%) and H-R&T (71%) groups. However, comparison of survival rates between herd personnel and veterinarians indicated that rates for the 6 herd personnel were within the range for the veterinarians at both 14 and 60 days after LDA correction (Table 5). (Comment: There was more difference associated with individuals performing LDA R&T than between herd personnel or veterinarians. Also, those with the highest survival rates had significantly higher milk production among surviving cows (Table 5)).

Table 5 – Comparison of survival rate and milk production at 14 and 60 days after LDA correction for herd personnel and veterinarians who performed an R&T procedure.

Person correcting LDA	In herd at 14 d*	In herd at 60 d*	Milk production at 14 d (kg)†	Milk production at 60 d (kg)†
Herd personnel	P=0.102‡	P=0.033‡	P<0.001§	P<0.001§
1	54/70 (77)	49/70 (70)	28.76 ± 7.15	41.52 ± 6.68
2	18/21 (86)	17/21 (81)	37.04 ± 11.35	51.46 ± 14.11
3	82/96 (85)	74/96 (77)	27.68 ± 9.97	41.07 ± 8.30
4	75/103 (73)	64/103 (62)	21.99 ± 9.13	34.89 ± 11.67
5	29/33 (88)	29/33 (88)	30.43± 6.97	40.85 ± 9.96
6	69/80 (86)	53/80 (66)	24.55 ± 10.84	37.62 ± 11.52
All herd personnel	327/403 (81)	286/403 (71)	26.62 ± 10.10	39.76 ± 10.75
Veterinarian	P=0.002‖	P=0.040‖	P=0.32¶	P=0.553¶
A	16/23 (70)	14/23 (61)	23.42 ± 5.50	34.62 ± 6.91
B	26/33 (79)	24/33 (73)	25.05 ± 13.39	36.82 ± 12.92
C	124/147 (84)	113/147 (77)	28.13 ± 9.79	39.30 ± 10.91
D	87/91 (96)	79/91 (87)	27.64 ± 10.21	38.60 ± 11.27
E	33/35 (94)	30/35 (86)	28.30 ± 10.91	37.99 ± 8.64
All veterinarians	286/329 (87)	260/329 (79)	27.65 ± 10.03	38.45 ± 10.82

*Value reported is number of cows/number of cows on which LDA was corrected (percentage). †Value reported is mean ± SD; to convert kilograms of milk to pounds of milk, multiply value by 2.2. ‡Represents results for χ^2 analysis with 5 df. §Represents results for ANOVA with 5 df. ‖Represents results for χ^2 analysis with 4 df. ¶Represents results for ANOVA with 4 df.

Table 6 – Multivariable model to predict removal from the milking herd at 60 days after LDA correction.

Variable	Estimate	P value	OR	95% CI
Intercept	-1.24	0.025		
Person correcting LDA	0.569	0.004		
Herd personnel			1.77	1.20-2.61
Veterinarian			Referent	Referent
Method of LDA correction	0.058	0.850		
Surgery (ie, laparatomy)			1.06	0.59-1.95
R&T			Referent	Referent
Mastitis	0.612	0.048		
Yes			1.86	1.01-3.44
No			Referent	Referent
Previous LDA	1.060	0.004		
Yes			2.89	1.41-5.92
No			Referent	Referent
Preoperative risk	0.613	0.001		
High			1.85	1.28-2.66
Low			Referent	Referent

OR = Odds ratio. 95% CI = 95% Confidence interval for the OR. Referent = Referent category for comparison within a variable. Odds ratios >1.0 indicate a greater risk of being removed from the herd.

For the follow-up survey, all 6 herd personnel [in] the H-R&T group reported that their policy regarding LDA correction had not changed. They generally requested a veterinarian for abdominal surgical repair of an LDA only when the cow was in a late stage of gestation or represented an unusual situation such as an extremely fat cow in which rolling the cow into a dorsal position may have resulted in danger to the cow or the farm workers or in which the herd person was not able to identify the gas-filled abomasum [with the cow in] dorsal recumbency. All 6 herd personnel reported that correcting affected cows [using] the R&T procedure was convenient and cost-effective, and they did not need to wait for a veterinarian to visit the farm. They believed that early diagnosis and correction enabled their affected cows to quickly return to a high milk yield.

The follow-up study revealed that the weighted mean annual cull rates were 37% for herds in the H-R&T group and 31% for the 7 herds that contributed the most cows to the V-R&T and V-Surg groups. The logistic regression model was used to predict the departure of affected cows from a herd as a result of culling or death (Table 6).

Discussion

The survival rate at 60 days after LDA correction differed between H-R&T (71%) and V-R&T herds (79%), and some (or all) of this difference may have been attributable to a higher culling pressure in the H-R&T herds. The multivariable model adjusted for some of this. Direct adjustment of the survival rates at 60 days for differences in annual herd cull rates was not deemed warranted, given that the herd annual cull rate [data included only a portion of the herds and did not include the herd death rates]. In general, the multivariable analysis confirmed that there was basically no difference in survival between the R&T and abdominal surgical techniques and that the H-R&T cows were more likely to leave the herd during the 60 days after LDA correction, compared with the V-R&T cows.

Continued inclusion in the milking herd is probably the most objective and reliable measure of success in correcting an LDA and reflects a cow's ability to avoid death or culling from all voluntary and involuntary reasons. Cows not surviving in the herd for 14 or 60 days after LDA correction may have died or been culled for many reasons that were unrelated to the LDA.

There was [increased] likelihood for increased survival in younger cows, although not significant. Other authors have also reported this. [Another study] found that a concurrent diagnosis of mastitis [and] LDA had a significant negative impact on survival [but] another study did not. The decision to cull a cow involves many factors, such as milk production, diseases, and age. The detected association between survival and variables such as mastitis and age may, in fact, have little to do with the success of failure of LDA correction. We [found no] associations between survival and the number of lactations, type of calving event, concurrent diseases ([other than mastitis]), degree of abomasal distention, antimicrobial treatment, number of days in lactation, or

number of days not lactating; this was in agreement with another study. However, some of these factors may have contributed to the assessment of preoperative risk made by the individual who corrected the LDA.

The study reported here was not designed as a randomized clinical trial. Cows were not randomly assigned to treatment at the time of diagnosis, but they were enrolled into the study throughout the year [according to preference of the owners]. Therefore, selection bias may have existed among the 3 treatment groups that may have been responsible for part of the differences in survival rates detected. Although a randomized clinical trial may have been preferable, there are clearly some limitations to implementing such a trial on large-scale commercial dairies. Management differences may have existed among the LDA treatment groups.

The survival percentages [for both R&T groups] were comparable to results achieved for V-Surg cows at 14 and 60 days. Also, the multivariable model confirmed a lack of any significant difference between the abdominal surgical and R&T procedures. Other authors have also reported that R&T and abdominal surgical correction have similar success rates, even when these studies were conducted as randomized blinded trials.

Analysis of our results indicated highly variable success rates with the R&T procedure among the 6 herd personnel. The herd person [associated with lowest survival rate] also performed more R&T procedures than any of the other 5 herd personnel in the H-R&T group. Furthermore, that herd had an unusually large number of accidental or random deaths and injuries (such as 2 cows that accidentally choked to death, limb and back injuries, and injuries to cows in the scrape alley) that resulted in the inability of cows to return to the herd and did not appear to be related to the incidence of LDA or to LDA correction. It may be important for veterinary practitioners to monitor LDA outcomes to identify those clients who may benefit from additional assistance and training.

Similarly, there was a wide dispersion in the range of survival within the V-R&T group at days 14 (70% to 96%) and 60 (61% to 87%). Whereas some of the variability may be explained by differences in herds, it also is possible that some practitioners are more adept at performing R&T procedures. Therefore, similar to the situation for the herd personnel some veterinarians may need additional assistance and training to improve their success rates.

The LDAs for the H-R&T group were diagnosed and corrected at a mean of 10 days of lactation, which was earlier than the mean for the V-R&T group and 8 days earlier than the mean for the V-Surg group. Earlier diagnosis in the H-R&T group would be consistent with our observation that, compared with results for cows with an LDA corrected by the veterinarians, milk production for cows in the H-R&T group had not decreased substantially before the LDA was corrected. It is reasonable to believe that the LDAs in the H-R&T group were corrected sooner after parturition on the basis that they were generally diagnosed during the daily examinations of postparturient cows (in accordance with their management protocol) and corrected immediately. We speculate that a request for examination by a veterinarian would have caused a delay of a few hours to an entire day, depending on the schedule of the veterinary practice or the scheduled herd health visit for the dairy.

Concurrent diseases should be compared among treatment groups only after considering that the number of days of lactation at the time of LDA diagnosis differed among the 3 treatment methods, thus giving the H-R&T group the fewest number of days at risk during the postpartum period for a disease or condition to develop and be diagnosed. It is also possible that the herd personnel may not have been as skilled as the veterinarians in detecting concurrent diseases and, therefore, reported fewer concurrent diseases on their data sheet. (Comment: As mentioned above, I think it is more likely that instead of days fresh at risk of periparturient disease, the reason substantially more disease was detected among veterinarian-corrected cows may reflect presentation of more diseased cows for possible veterinary surgery, and/or more likelihood that those diseases will be detected when veterinary attention is given).

It is not the intent of the authors to advocate that herd personnel be trained to diagnose and correct LDAs by use of an R&T procedure on their own dairy. Rather, our intent was to acknowledge that the procedure is performed on some large commercial dairies. Consequently, it is important for veterinarians to provide assistance and training when needed to ensure the procedure is performed properly and also to monitor the outcomes to ensure that the desired results match with the management goals for the dairy.

Concurrent mastitis, history of a previous LDA, preoperative risk, and veterinary skill in LDA correction were significantly associated with survival at 60 days after LDA correction.

Results of this observational cohort study supported the theory that some producers or herd personnel can be taught to successfully use an R&T procedure to correct LDAs in cows on their own dairy, with survival rates within the range of those for dairy practitioners. However, the variability among veterinarians and also among herd personnel was considerable, which suggested that outcomes after correction of an LDA be monitored so that negative patterns can be quickly identified and additional training provided when indicated. (Comment: Many of our readers would probably agree with this. However, considerable tact may be necessary when discussing additional training with herd personnel or veterinarians because of associations between their performing LDA correction and relatively poor outcomes. Nevertheless, this interesting study shows that monitoring LDA outcome by person performing correction is worth doing, just as regularly monitoring who performs AI breedings and other important activities on a farm is).

(Please note once again that this paper in entirety was in JAVMA as shown on below the title on page 1).

I like to hear from our readers, including suggestions for future topics of interest. Please contact me at (435) 797-1899 M-W, (435) 797-7120 Th-F or David.Wilson@usu.edu.

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