Offering Ration Balancing as a Service

David T. Brennan D.V.M
Country Roads Veterinary Services Inc.
Ashland Ohio
SHORT AND LONG TERM SUCCESS OF TRANSFIXATION PIN CASTS USED TO STABILIZE LONG BONE FRACTURES IN RUMINANTS

Joe Lozier, DVM
Farm Animal Surgery Resident

PUBLICATION

• The material in this abstract has been accepted as a manuscript for publication in the Canadian Veterinary Journal

INTRODUCTION

RUMINANT FRACTURES

• Ruminant limb fractures account for up to 10% caseload at referral centers (Grangl et al 2006)
• Challenges
  • Economic constraints
  • Increased forces
• Management
  • Stall rest
  • External coaptation
  • Internal fixation

LIMITATIONS OF CASTING

• Ruminant anatomy
  • Cast cannot reach past mid-radius or mid-tibia
  • Joint above and below cannot be immobilized in fractures of Radius/ulna
  • Humero-
  •_elbow
  • Tibia
  • Femur
• Thomas splint- R/U and Tibia
• 54-57% success (Grangl et al 2006; Crawford et al 1985)
• Complications
  • Poor alignment → ALD
  • Opening of fractures within the cast

TRANSFIXATION PIN CASTS

• External fixator for LA
• Fracture site → significant decrease in strain
• Eliminates bending, torsion, compression, distraction, shear
• Minimal movement between fragments
• Tissue/blood supply/hematoma not disrupted
• Efficient, cheap, easy to apply
• Minimizes distance from bone to external frame
• Can be made for any sized patient
**MATERIALS AND METHODS**

- Ruminants presenting between January 2005 and December 2015 with long bone fractures stabilized by a TPC
- Short term success: Survival to return to the farm without external coaptation
- Short term failure: Euthanized or died prior to removal of final coaptation
- Long term success (return to intended use) and residual lameness was obtained via telephone interviews
- Lameness: 0= not lame, 1= lame while ambulating, and 2= non-weight bearing lameness
- Satisfaction: 1 = completely unsatisfied, 2 being somewhat dissatisfied, 3 being neutral, 4 being somewhat satisfied, and 5 being completely satisfied

**STATISTICAL ANALYSIS**

- Logistic regression
  - Independent variables:
    - Species
    - Age
    - Body weight
    - Whether the fracture was open or closed
    - Fracture configuration (simple or comminuted)
    - If fracture was proximal or distal
  - Multiple linear regression to rule out independent variable collinearity

**PROCEDURE - PREPARATION**

- Preoperative planning with films to determine placement of pins
- General anesthesia or sedation with regional blockade or epidural
- Dorsal recumbency
- Limb suspended vertically

**PROCEDURE - PIN SELECTION**

- Pins 20-30% diameter of waist of diaphysis of bone
- Pins that are too small will break
- Pins that are too big could result in fracture through pin site

**PROCEDURE - PIN LOCATION**

- Positive profile pins
- Pins should be 2-4cm apart
- Diverge 30 degrees in frontal plane
- Stronger fixation
- Lower risk of fracture
PROCEDURE- PIN LOCATION

- Pins may be placed in proximal cannon bone with cannon fractures.
- Ensure enough bone proximally to safely place enough pins.

PROCEDURE- PIN PLACEMENT

- Stab incision to bone.
- Hole drilled medial to lateral or lateral to medial.
- Irons smaller than pin used.
- Minimize heat production.
- Tap hole or use self tapping pins.
- Engage threads in both cortices.
- Cut pins with 3-5mm of pin left on either side.
- Appropriate technique prevents early loosening of pins.

PROCEDURE- CAST APPLICATION

- Double-layer stockinet.
- Padding.
- Cast application.
- Push pins through cast and cover with last four layers weakest point of construct.
- PMMA.
- Pins should be as far distal from the end of cast as possible.

REMOVAL

- Calf.
  - Pins removed in 2-3 weeks.
  - Casted/splinted for 2-3 weeks.
  - Stall rest for 2-3 weeks.
- Adult cattle.
  - Pins removed at 6-8 weeks.
  - Cast for 4-6 weeks.
  - Stall rest for 4-6 weeks.

RESULTS

- 25 cattle, 7 goats, and 7 sheep.
- Ages ranged from 1d to 4.5y.
- Weight ranged from 10 to 450 kilograms.
- Fracture.
  - Common metatarsus (n=16, 41%).
  - Common metacarpus (n=11, 28%).
  - Radius/ulna (n=9, 15%).
  - Tarsus (n=5, 13%).
  - proximal phalanx (P1) (n=1, 3%).
- 27 closed (69%) and 12 open fractures (31%).
- 22 (88%) comminuted fractures and 10 (32%) simple fracture configuration.

Kofler, 2014.

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- 27 closed (69%) and 12 open fractures (31%).
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short term results

- 31 (79%) had a positive short-term outcome
- 8 (21%) died or were euthanized
- 4 developed osteomyelitis secondary to an open fracture
- 2 fracture at pin site
- 1 sudden death
- 1 developed septic arthritis in another limb secondary to HBC

statistical results

- Outcome variable
  - Model: glm.A1A, step 4, and r²=0.635
- Body weight
  - Wald 7.118, df=1, p= 0.008
  - Odds ratio 1.022 (1.006-1.039)
  - 1 kg increase 1.022 increase in odds of being euthanized
  - 100 kilogram animal has 6.464 the odds of being euthanized as a 1 kg animal
- Species
  - Wald 3.852, df= 1, p= 0.049
  - Odds ratio 0.013 (0.000-0.972)
  - Odds ratio of 77 for short term survival

long term results

- Long term follow-up for 20/31 patients with positive short-term outcomes
- 13 bovine, 4 caprine, 3 ovine
- 17 (85%) performed as expected
- 1 (5%) indicated a satisfaction level of 2/5

<table>
<thead>
<tr>
<th>Complication</th>
<th>Number of patients</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lameness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>11</td>
<td>55</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>35</td>
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<tr>
<td>2</td>
<td>1</td>
<td>5</td>
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<tr>
<td>Satisfaction</td>
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<td></td>
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<tr>
<td>0</td>
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<td>25</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

discussion

- Wide age/weight range
- Multiple species
- Multiple surgeons (7) over 10 years
- Long term follow-up via phone interview
- Owner memory
- Owner-graded lameness
- Number of cases (39)
**DISCUSSION**

- Radius/ulna and tibial fractures → similar success rates similar to those distal limb
- Open fractures
- Not graded
- Decreased odds of euthanasia among cattle
- Calmer demeanor
- Frequent resting in recumbency
- Tolerance to external coaptation
- Robust radius formation.

**REFERENCES**


Value Added Services and Other Assorted Tid-Bits

Eric M. Shaver, DVM
East Holmes Veterinary Clinic
Ohio Dairy Vets 2018
A re-visit of ideas “stolen” from others

- KIS testing
- Compounded bulk fluids
- Milk cultures- changing thoughts
KIS- kidney inhibition swab
KIS- costs/time

- Instrument cost: $231.00
- Cost per test: $4.28
- Time investment: 20 minutes set up / 4 hour run time
- Potential uses: ELDU {listeriosis ex.}, chronically ill patients
- Peace of mind
- Draw-back: “caution” -vs- legal threshold
Bulk Fluids for Large Animals

- Controversial
- May be the only alternative for many of our client’s stock
- Uses: colics, RTAs, cecal torsions, mesenteric torsions, scouring calves, emphysematous C-sections, TRP retrievals, esophageal/pharyngeal injuries, myositis
- Scouring calves & colics primarily
Bulk Fluids

- Ringer’s salts
- Physiologic saline
- Bicarb solution
- Physiologic dextrose
- WCVM formula
- +/- additives
Ringer’s Salts

- Compounded by Ritzman Pharmacy a local chain
- Cost: $2.99
- Lactate no longer available in powder format
- 1 jar is added to 5 gallons of distilled water
Physiologic Saline

- Used mainly in equine myositis cases
- 1 liter hyper-tonsic saline added to 2 gallons of distilled water approximates physiologic saline
Physiologic Bicarb Solutions

- Scouring calves primarily
- 40ml of baking soda added to 1 gallon of distilled water approximates physiologic bicarb
Physiologic Dextrose

- Hypoglycemic calves primarily
- 400ml of 50% dextrose added to 1 gallon of distilled water approximates 5% dextrose solution
WCVM Formula

- NaCl 15g
- KCl 4g
- NaHCO3 30g
- 50% Dextrose 100ml
- Qs 1 gallon distilled water

Or substitute 11g NaCl plus 8g lite salt for the NaCl and KCl above
Fluid additives

- Aminoplex
- CMPK
- DMSO
- Lidocaine
- etc
Milk Cultures

- In-house
- ODA
- Petlabs-Richfield, OH
In-house milk cultures & sensitivities

- Spectrum Mastitis System
- Mueller-Hinton
- Discs
In-house milk cultures & sensitivities

- “Rapid” turn-around time
- Accuracy concerns
- Sensitivity concerns
- Bulk tank concerns
- Cost- plates: $5.90 each
- Cost- labor: 30 minutes
In-house milk cultures & sensitivities
Ohio Department Of Agriculture
Milk cultures & sensitivities

- Accurate
- Slow turn-around
- Sensitivity concerns
- Costly:
  - ODA: $20
  - UPS: $12
  - Accession: $5
Pet-Labs aerobic cultures

- Erhardt Bell, DVM- microbiologist as well
- Phone lab: 440-327-2062
- Phone Erhardt cell: 440-465-3392
- Courier pick-up Mon-Sat
- Accurate
- Cost $12.00
- CDC sensitivities- relevance to food animal?
**Pet-Labs aerobic milk culture**

---

**PetLABS, Inc.**
Diagnostic Laboratories
2510 Substation Rd. Medina, OH 44256
(330) 220-6435, (330) 220-1661 (fax)

**Client:** Dr. Shaver, D.V.M.
**Address:** 5503 Co Rd 120, P.O. Box 286
**City:** Berlin, OH 44616
**Phone:** (330) 193-2057
**Account:** CL12-1564

**Patient Name:** "#479 Right Front"
**Species:** Not Ind.
**Owner:** Wellboldt, Dean
**Age:** F
**Sex:** Not Ind.

<table>
<thead>
<tr>
<th>Culture</th>
<th>Source</th>
<th>Status</th>
<th>Isolate #1</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobic</td>
<td>Milk Right Front</td>
<td>FINAL</td>
<td>Heavy growth of Streptococcus dysgalactiae ssp dysgalactiae</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Blank fields indicate no information available. No further testing performed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>MIC</th>
<th>Iso #1</th>
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</thead>
<tbody>
<tr>
<td>Ampicillin</td>
<td>&lt;=2</td>
<td>S</td>
</tr>
<tr>
<td>Amoxicillin/ Sulbactam</td>
<td>&lt;=4</td>
<td>S</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>&gt;=8</td>
<td>R</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>&lt;=0.5</td>
<td>S</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>&gt;=8</td>
<td>R</td>
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<tr>
<td>Gentamicin</td>
<td>&lt;=0.5</td>
<td>S</td>
</tr>
<tr>
<td>Imipenem</td>
<td>&gt;=0.5</td>
<td>S</td>
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<tr>
<td>Kanamycin</td>
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<td>S</td>
</tr>
<tr>
<td>Moxifloxacin</td>
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</tr>
<tr>
<td>Mupirocin</td>
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</tr>
<tr>
<td>Nitrofurantoin</td>
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<td>S</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>&gt;=0.5</td>
<td>S</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>&gt;=0.5</td>
<td>S</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>&gt;=0.5</td>
<td>S</td>
</tr>
<tr>
<td>Trimeth/sulfa</td>
<td>&lt;=10</td>
<td>S</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>&lt;=0.5</td>
<td>S</td>
</tr>
</tbody>
</table>

*SYN-S results indicative synergy is likely with a susceptible penicillin or a susceptible glycopeptide

Key:
S = sensitive
I = intermediate
R = resistant

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Thank you for choosing PetLABS
DVM Rapid Test

- Semen Counter equine, canine, bovine
- IgG- equine, camelid, bovine
- Cost- $1495.00
- Cost- Foal IgG $12.00
  Camelid IgG $13.33
  Sperm Concentration $12.66
- Time: 10 to 20 minutes
Equipment Rental Service

- Upsi-daisy
- Hip lifts
- Slings
- Belly bands
- Callicrate banders
- Chute

- Require a deposit
- Charge a fee for Upsi-daisy and chute
- Must track & log location or they quickly get forgotten
Down Cow Profile

- Calcium
- Phosphorous
- GGT
- Magnesium
- CK
- +/- electrolytes
- Pull prior to 2\textsuperscript{nd} treatment and held in event of response failure
- Many clients trained to pull themselves
EHVC Fleet Maintenance Program

- Oil change every 4000-4500 miles
- 2 at Quick Lube
- 3rd at the mechanics
- A thorough “physical” is performed
- Minor issues addressed at oil change
- Larger issues scheduled before a “failure” occurs
- Consumes ½ day or so
- More expensive?
EHVC Fleet Purchase Program

- On-line dealer auction
- Auction rates vehicles and declares “finds”
- Target auctions catering to the sale of government surplus or fleet lease vehicles due to better maintenance records
- Discrepancies are negotiable
EHVC fleet purchase program

- Requires individual with dealer’s license—In our case that is our mechanic
- Fee—$1500
- Delivery—additional
- Color & style easy to choose
- Able to refine some options as well easily
- Can research available vehicles ahead of the auction to establish a max bid
- Many auctions publish expected sale bid
Fleet purchase formula

- \[ \text{\{New$ + Tax\} - \text{Residual$}\}/\text{Life Miles} = \$/\text{mi} \]
- \$43K + 7\% - 5K / 200K = \$0.205/\text{mi} \]
- \[ \text{\{Used$ +$1500 +Shipping + Tax\} - \text{Residual$}\}/200K - \text{Odometer} = \$/\text{mi} \]
- \[ \{\$27,750 + \$1500 + \$440 +2058.08\} - 5K/ (200,000 -3710)\text{mi} = \$0.136/\text{mi} \]
The Current “Fleet”
Fleet purchase examples

- 2012 Dodge Mini Cargo Van-114K: $4300
- 2013 Chevy ¾ Ton Crew Cab- 4K: $27750
- 2014 Dodge Mini Cargo Van- 110K: $5900
- 2012 Dodge Ram Cargo Van-109K: $6100
- 2013 Chevy ¾ Ton Ext Cab- 99K: $17000
- 2014 GMC ¾ Ton Crew Cab- 97K: $16600
EHVC Fleet Program

- Significant savings in cash out-lay for vehicles
- Our mechanic is also our dealer
- May accelerate repair timeline
- Less anxiety over oopses
EHVC Pick-up & Delivery Service

- Pick-ups: KIS samples, milk cultures, down-cow profiles, sheep & goat c-sections, flat calves & foals for fluids/plasma, colicy foals for surgery
- Primary use is for commercial kennel
- Deliveries: supplies & drugs, hip-lifts, Upsi-daisies, slings
- Also can serve as a temporary practice vehicle if a truck is down
Antimicrobial Stewardship on Dairy Farms

Greg Habing, DVM, PhD, DACVPM
Assistant Professor
Habing.4@osu.edu

Antimicrobial Stewardship on Dairy Farms

- The overall goal is to use less antibiotics
- On dairy farms, antimicrobials primarily applied for treatment of disease
- Farm workers have an important role in decision making

Farm worker directed Antimicrobial Stewardship Education

- Our overall goal is to reduce antimicrobial use while maintaining animal health and producer profitability.
- 4-year USDA funded project
- Collaboration between investigators at OSU and UC Davis
- Proactive and industry-led approaches are more likely to be effective.

What we’re planning to do....

Survey farm personnel and veterinarians
1. Identify case definitions among treaters
2. Identify potential barriers to reduced antimicrobial use
3. Quantify the potential for reduction in AMU through refined case definitions

Create and test an intervention
1. Create worker-directed antimicrobial stewardship education
2. Test the impact on worker knowledge, attitudes, and practices
3. Test the impact on quantified antimicrobial use and antimicrobial resistance

Disseminate the results through the Veterinary Extension Program

Questions? Feedback?
habing.4@osu.edu
Stifle Stabilization in Cranial Cruciate Ligament Rupture in Cattle

Joe Lozier, DVM
Farm Animal Surgery Resident
The Ohio State University

Introduction

- 21% of stifle lameness due to CCL rupture (Ducharme et al., 1985)
- Likely underdiagnosed
- Results in
  - Increased recumbency
  - Decreased weight gain
  - Decreased milk production
  - Reluctance of bulls to breed
  - Infertility

CCL Rupture: Diagnosis

Signalment and history

- Bulls present secondary to severe osteoarthritis
  - “Straight hock” conformation
- Cows present secondary to acute trauma

Physical exam findings

- Acute: non-weight bearing lameness with effusion
- Chronic: partially weight bearing
- Crepitus may be heard and felt
- Drawer sign
**Radiographs**
- Intercondylar eminence overlapped by the condyles
  - Tibia will be displaced cranially in lateral
  - Intercondylar eminence cranial to the femoral condyles
  - DJD

**Cattle with low perceived value**
- Untreated
  - Poor prognosis
  - Will progressively worsen
  - Loss of condition and atrophy musculature of the effected limb
  - Breakdown in the contralateral limb
  - Inability to rise
  - Slaughter

**Surgical therapies**
- Imbrication
  - Non-anatomic reconstruction, “over-the-top”
  - Advantages of this procedure
    - Does not enter joint
    - Less risk of catastrophic failure
    - Short procedure time
    - No need for special equipment or implants
  - Prognosis for satisfactory outcome 59%
  - Poor outcome >2 month chronicity
  - Less effective at higher weights (>730kg)
- Anatomic reconstruction

**Considerations**
- Ultimate tensile load of a CCL 1.5x BW
- Mean rupture force CCL of 4,541N
- Tension and motion over the surgical site
- High risk of catastrophic failure

**Stifle imbrication**
- Aim = stabilize the stifle with fibrous tissue → delay DJD
- Advantages of this procedure
  - Does not enter joint
  - Less risk of catastrophic failure
  - Short procedure time
  - Technically easy to perform
  - No need for special equipment or implants
  - Prognosis for satisfactory outcome 59%
  - Poor outcome >2 month chronicity
  - Less effective at higher weights (>730kg)

**Over-the-top**
- Ultimate tensile load of this graft 20-30% of the native cruciate
- Success rate of 43% in bulls over 900kg (n=14)
- Success rate of 85% in cows less than 900kg (n=13)
- Complications
  - Incisional failure → septic arthritis
  - Graft failure
  - Contralateral cruciate ligament rupture
Anatomic Reconstruction

- Complications similar to gluteobiceps graft
- Nylon cords used currently
- 66.7% reported success rate in cows (n=9)

Current Research

Theory

- Inspired by canine extracapsular techniques
  - Lateral suture
  - “Tightrope”
- Remain outside the joint
  - Reduce risk of catastrophic failure

Materials

- 900 lb-test nylon leader line with stainless steel crimps
- 2, 3, and 4 crimps loaded to failure
  - Rupture
  - Crimp slip
  - Max elongation 70mm

Results

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Force to failure (N)</th>
<th>Elongation (cm)</th>
<th>AUC (Ncm)</th>
<th>Mechanism of failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knot</td>
<td>1265.4 ± 203.1</td>
<td>7.0</td>
<td>69.9 ± 20.8</td>
<td>Max elongation</td>
</tr>
<tr>
<td>2 Crimps</td>
<td>2472.8 ± 429.8</td>
<td>3.64 ± 0.18</td>
<td>38.1 ± 5.3</td>
<td>9 break, 3 slip</td>
</tr>
<tr>
<td>3 Crimps</td>
<td>3636.2 ± 568.9</td>
<td>4.08 ± 0.29</td>
<td>56.3 ± 10.9</td>
<td>8 break, 4 slip</td>
</tr>
<tr>
<td>4 Crimps</td>
<td>3806.8 ± 1038.5</td>
<td>4.11 ± 0.78</td>
<td>60.0 ± 23.7</td>
<td>11 break, 1 slip</td>
</tr>
</tbody>
</table>
**Results**
- Data normally distributed
- One-way ANOVA to compare means
- Elongation: No statistical difference
- Force to failure: Significant difference between 2 crimps and 3 crimps, and 2 crimps and 4 crimps
- No difference between 3 crimps and 4 crimps

**Isometry**
- 3-D problems
  - Only accounted for cranial/caudal
- Did not account for lateral movement
  - Lateral epicondylar flare
  - Fibula
  - Extensor groove
- Adjustment of tunnels
  - Possible due to looped nature

**In vivo testing**
- 8 apparently healthy cows
  - 4 extracapsular stabilization
  - 4 control
- Cranial cruciate ligament transected
- Loop placed with 3 crimps at proposed location
In vivo testing

- Lameness subjectively scored once per week
  - Blinded observers
- Lameness objectively scored at 3 time points
  - Prior to surgery
  - After surgery
  - After 3 months

Results

- Data not normally distributed (Kolmogorov-Smirnov)
- Kruskal-Wallis: no difference between groups

Objective Lameness Scores

<table>
<thead>
<tr>
<th>Distribution of Weight</th>
<th>Prior to Surgery</th>
<th>1 Day Post-Op</th>
<th>3 Months Post-Op</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hind end: Total weight</td>
<td>42.5%</td>
<td>41.2%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Stabilized right stifle: Hind end</td>
<td>39.5%</td>
<td>10.9%</td>
<td>18.5%</td>
</tr>
<tr>
<td>Control right stifle: Hind end</td>
<td>43.2%</td>
<td>23.4%</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

Discussion

- Approach involved incising lateral femoropatellar ligament
  - 100% medial luxation rate- affect on lameness
- Not naturally occurring disease
- Ideal material?
  - None of the sutures were intact at 3 months
  - Is this long enough

References

References


DA & OB Outcomes
at Dairy Vet & Management Services
Goshen, Indiana

Shaw Perrin DVM
(Ohio State 2010)
Describe:
Why and how we’ve been tracking DA & OB outcomes at a multi-DVM dairy practice in northern Indiana.

And results so far.
Robert Zell, DVM Purdue ‘72
Old Method, Feb 2014 to Feb 2016

• Handwritten record on invoice
• Entry into excel by receptionist
• Follow up phone call 2 months later
Date *

Farm *

Cow Name or Number *

Lactation

   ○  1
   ○  2
   ○  3+

DIM

Temperature

Type *

   ○ LDA
   ○ RDA
   ○ RTA

   ○ Cecal Retroflexion

BHBA

Ketostick

   ○ Negative
   ○ Trace
   ○ Small
   ○ Moderate
   ○ Strong

Glucose

Deflation *
Side cut *
- Right
- Left

Difficulty *
- Easy
- Difficult

Body Condition
- Thin
- Fat

Concurrent or previous diseases
- Dystocia
- Twins
- Milk Fever
- RP
- Metritis
- Pneumonia
- Enteritis
- Peritonitis
- Fatty Liver
- Impaction
- Lameness
- Other:
Lactation
656 responses

DIM
572 responses

Deflation
745 responses

Side cut
604 responses
DVMS: DA follow-up

Farm: Brad

On 11-2-17, Dr. Lenn did a DA surgery on cow 15083.

As of 1-2-18, is she a part of your herd? Circle YES or NO.

If yes, how is she milking? Circle POOR AS EXPECTED BETTER THAN EXPECTED Pounds/day (if known).

If no – Circle DIED or CULLED.

Did cow have swelling or infection (pus) at incision site? Circle YES or NO.

Comments __________________________

**Please send this slip with your payment.** We appreciate your response as we strive for excellence in veterinary medicine. Please call with any questions! DVMS.

(Please indicate if you would prefer to communicate this information a different way __________________________)
Survival by Type (490 Cases)

<table>
<thead>
<tr>
<th>Type</th>
<th>Survival Rate</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDA</td>
<td>85%</td>
<td>(381/449)</td>
</tr>
<tr>
<td>RDA</td>
<td>83%</td>
<td>(24/29)</td>
</tr>
<tr>
<td>RVA</td>
<td>33%</td>
<td>(4/12)</td>
</tr>
</tbody>
</table>
DA by Lactation

650 cases
1L  29.1%
2L  23.2%
3L  47.7%

Survival by Lactation

459 cases
1L  91% (130/143)
2L  83% (85/103)
3L  82% (173/213)
Deflation

60d Survival

Deflated: 72% (47/65)
Not deflated: 85% (323/379)
Factors associated with survival in the herd for dairy cows following surgery to correct left displaced abomasum
Jennifer L. Reynen, David F. Kelton, Stephen J. LeBlanc, Nathalie C. Newby, Todd F. Duffield

Association between β-hydroxybutyrate concentration at surgery for correction of left-displaced abomasum in dairy cows and removal from the herd after surgery.
Croushore WS Jr¹, Ospina PA, Welch DC, Zawisza DJ, Nydam DV

DVMS data, LDA Survival by BHB

<table>
<thead>
<tr>
<th>BHB Level</th>
<th>Survival Rate</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHB 1.1 or below</td>
<td>76%</td>
<td>(48/63)</td>
</tr>
<tr>
<td>BHB 1.2 or above</td>
<td>86%</td>
<td>(169/194)</td>
</tr>
</tbody>
</table>
One way to secure abomasum prior to pyloropexy
Compares results from omentopexy vs. pyloropexy:

- Omentopexy had a 14% failure vs. 0% failure with pyloropexy
Incision Infection (276 responses):

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>82%</td>
<td>225/276</td>
</tr>
<tr>
<td>Yes</td>
<td>18%</td>
<td>51/276</td>
</tr>
</tbody>
</table>
OB Tracking: Only 66 cases so far
OB cases (66 cases):

By Lact

1L  41.5%
2L  13.8%
3L  41.5%
60 day Survival, All OBs

67%   (26/39)
Conclusions

• An attempt at an Outcomes Based Approach
• Overall about 85% of our DAs are still milking 2-months post SX
• Better chance of survival if 1L, ketotic, not deflated, and done by Dr. Zell!