

Anschutz

Project Bum Bum: Clinical Scoring System and Assessment of Medical Treatments for Rectal Prolapses in Mice

Leanna F. Chaffee¹, Genna M. Nault¹, Holly R. Goold¹, Michael K. Fink^{1, 2}, Lauren Habenicht^{1, 2},
Derek L. Fong^{1, 2}, Jori K. Leszczynski^{1, 2}, Chris A. Manuel^{1, 2}

Office of Laboratory Animal Resources¹, Department of Pathology², University of Colorado Anschutz Medical Campus, Aurora, CO

Background and Significance

Rectal prolapses occur frequently in mice used for biomedical research. Little information is available on standardized methods for assessment or successful treatments, thus many cases result in euthanasia.

Goals

Determine the efficacy of treating rectal prolapses with an injectable NSAID versus other common topical treatment regimens.

Determine if factors such as tissue health, size, and co-morbidities could be kept stable in order to get animals to their desired end-points without requiring premature euthanasia.

Materials and Methods

Animals were distributed into four treatment groups:
1.) 5 days of meloxicam (2 mg/kg SC) with daily topical triple antibiotic ointment (TAB)
2.) Daily TAB with dexamethasone
3.) Daily TAB alone
4.) Daily application of sterile lube

Once enrolled, all treatment groups were evaluated on: day 0, 7 and 28.

A novel scoring system was used to assess tissue health (scored 1-5).

Tissue protrusion and diameter were recorded.



Regulatory Considerations

All treatments were managed under veterinary care and treatments were performed as a veterinary treatment. Thus, all mice enrolled in the study were kept on the investigators IACUC protocol maintaining the mice within their active research study during the therapy trial. Researchers were able to use the animals as intended in their protocol throughout the treatment since the animals were kept in their home cage and regular housing room.

Additional Demographics

In addition to tissue health and size, information was gathered to help determine potential causes of the prolapses and the factors they may play in prolapse progression.

These factors included:

- Strain
- Gender
- Housing Conditions
- Origin – whether bred in-house or from vendor
- Use in GI related study or not
- Previous manipulations/medication administration
- Date of last cage change
- History of recent cage flooding

Humane End-Points

Animals used in our study were determined to have reached a humane end-point based on the following criteria.

Severe mucosal ulceration
Progression of co-morbidities
Decrease in overall health
An inability to defecate

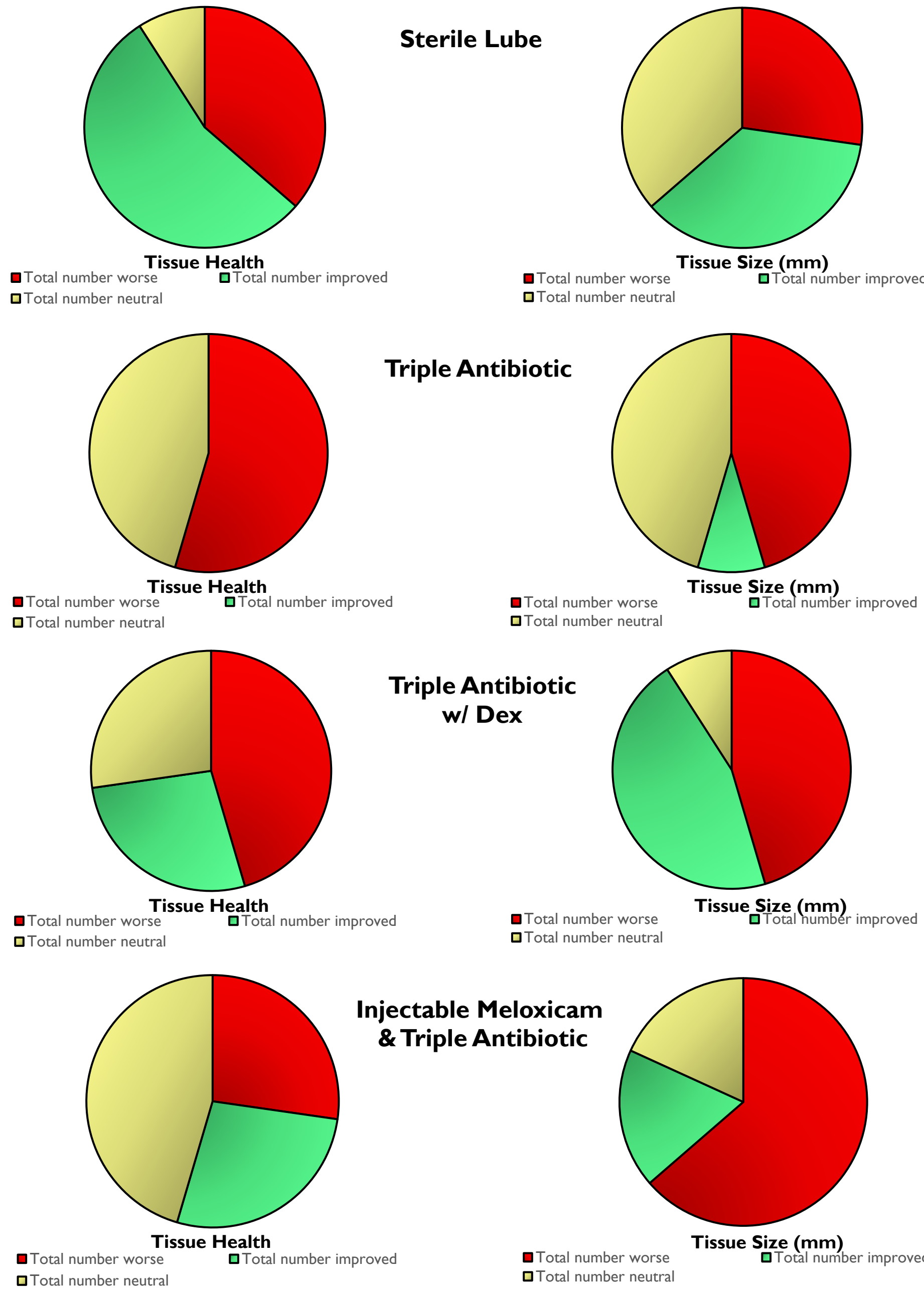
Results

A total of 48 animals were enrolled in the study. Of those 48 available for analysis:

- 41 (85%; n = 9-11/tx group) cases reached the 7-day time point and
- 27 (56%; n = 5-9/tx group) cases reached the 28-day time point

Mean mucosal health scores were compared within each treatment group to the initial observation and between treatment groups at each time point for evidence of benefit.

Results Continued



Conclusions

- No treatment option consistently decreased the severity or led to resolution of rectal prolapses at 7 or 28 days.
- The primary factor found most useful for clinical assessment was mucosal tissue health.
- Overall, size of the prolapsed tissue did not correlate with deterioration of the animal's condition.
- No trends were identified in demographic data to help anticipate spontaneous rectal prolapse.

Our results suggest that daily application of sterile lube was just as effective as other treatments to maintain tissue health and may be the most reasonable approach to maintaining rectal prolapses in mice

Acknowledgements

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Scoring of Rectum Health

Score	Tissue Health
1	Healthy (pink and moist)
2	Mild inflammation but still moist
3	Moderate inflammation and dry tissue
4	Moderate inflammation with small ulcerations without hemorrhage
5	Moderate to severe inflammation with marked ulcerations and hemorrhage

Score 1



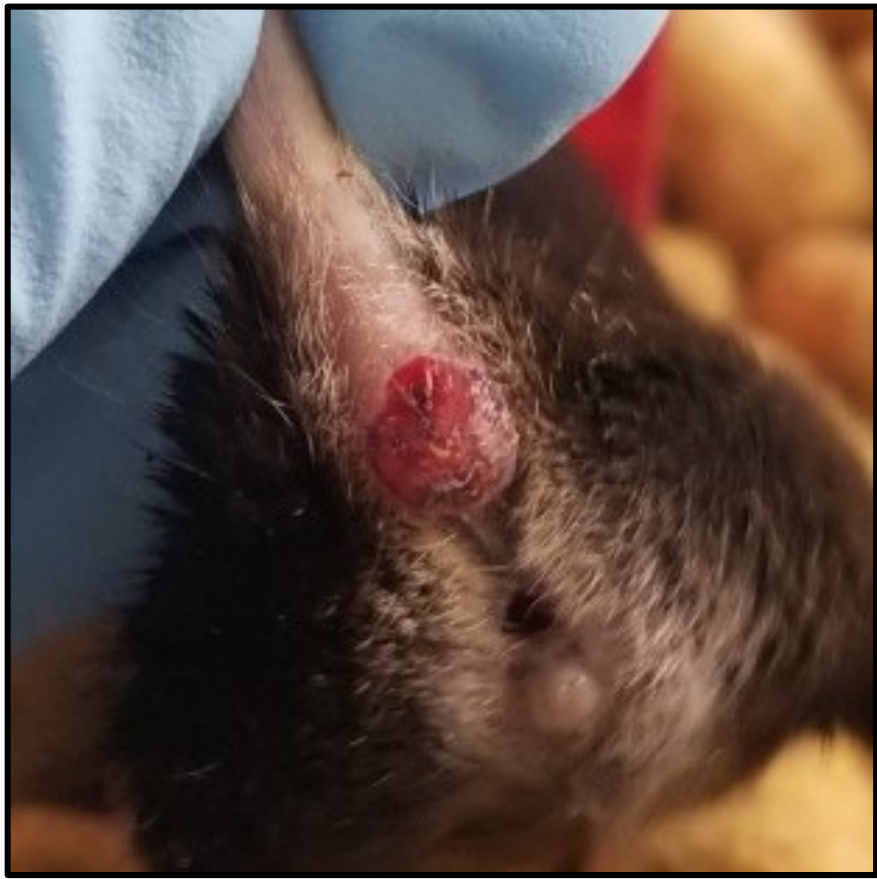
Score 2



Score 3



Score 4



Score 5



Measurements (mm) of Both Protrusion and Diameter

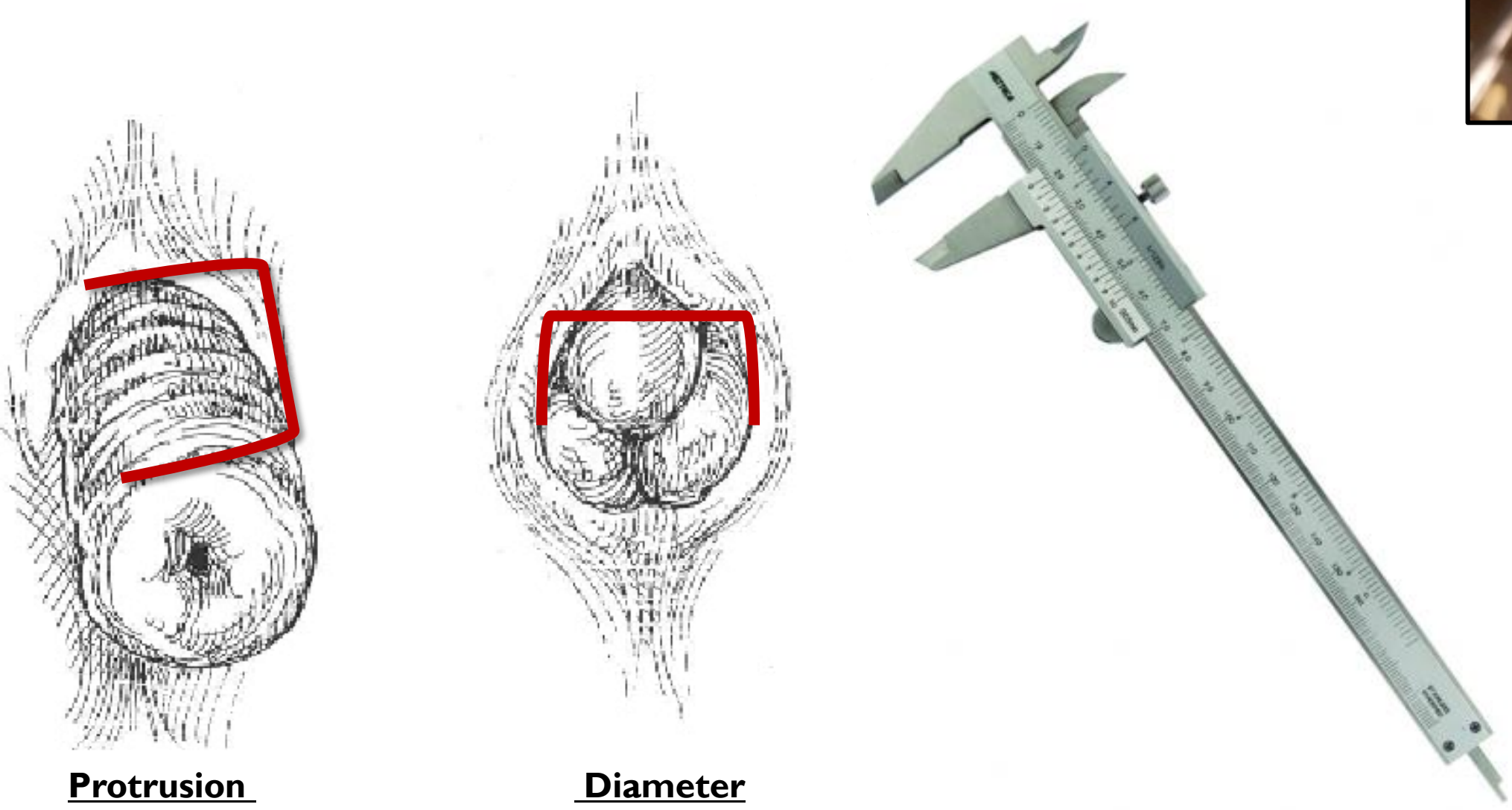


Figure 1. Diagram of how each prolapse was measured in millimeters using standard calipers.