A Reinjection Study of Sn-117m Colloid to Treat Canine Osteoarthritis Shows Safety and Efficacy

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   - JC Lattimer / Associate Professor of Radiology and Radiation Oncology / University of Missouri Veterinary Health Center / Intraarticular injection of a tin-117m radiosynoviorthesis agent in normal canine elbows causes no adverse effects / Veterinary Radiology & Ultrasound / KA Selting, JM Lunceford, JR Holland, J Simon, NR Stevenson, CA Doerr

Background

Homogeneous Sn-117m colloid (HTC) was previously tested in **canine elbow osteoarthritis (OA)** by intra-articular injection aka **radiosynoviorthesis (RSO):**

Normal hounds (n=5)

- Demonstrated safety at 6 weeks (euthanasia)

Grade 1-2 elbow OA (n= 34 dogs and 34 elbows per protocol)

- Safe
- Effective based on canine brief pain inventory (cBPI), lameness examination

Grade 3 elbow OA (n= 14 dogs and 25 elbows per protocol)

- Safe
- Effective based on cBPI, lameness exam, force plate

*See **e-poster 0660 Radiosynoviorthesis** using Sn-117m colloid to treat canine elbow OA demonstrates efficacy and safety*

Purpose of Reinjection Trial

HTC is currently commercialized in the US as a treatment for OA in dogs using radiosynoviorthesis (RSO). Commencement of human clinical trials have been conditionally approved by Health Canada using ascorbic HTC .

Validating the **safety and efficacy of repeat therapeutic RSO injections** in canines can potentially be applied to human subjects.

Trial Design

10 dogs from one of the previous trials were enrolled in the **RSO reinjection trial** if their symptoms remined unchanged or worsened by cBPI or force-plate analysis after 6-12 months. These dogs received an additional RSO procedure with the commercial dose (1.7 mCi/63 MBq per elbow normalized to the BSA of a 50 lb/22 kg dog) in both elbows (n=9 dogs and 18 elbows per protocol) and were followed for 12 months for safety, and efficacy as defined by:

1. Improvement in canine brief pain inventory (cBPI)
   - Reduction (improvement) of ≥1 of pain severity score (PSS) ***AND*** ≥2 of pain interference score (PIS)
   - Reduction (improvement) of ≥1 of pain severity score (PSS) ***OR*** ≥2 of pain interference score (PIS)

2. Force plate—improvement from baseline of ≥5% in any timepoint in the peak vertical force (PF) or the mean vertical impulse (IMP) at 3 or 6 months
3. Clinician's lameness exam—significant improvement between 2 assessment timepoints

Results: Safety

No clinically significant safety issues noted by evaluation of:

- Joint fluid
- Urinalysis
- CBC and chemistry
- Physical examination

Results: Efficacy cBPI

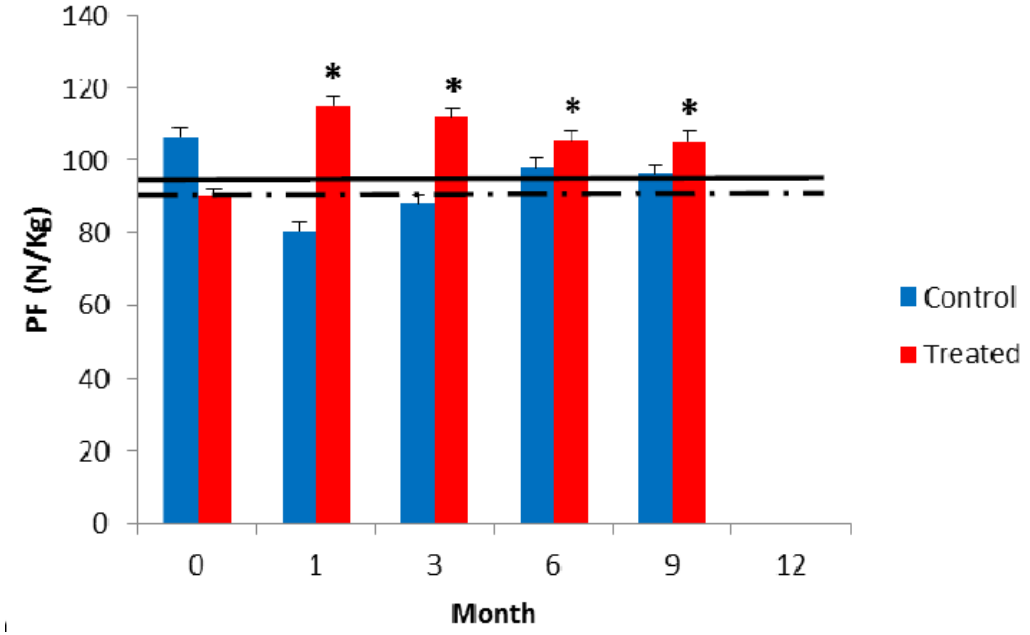
A reduction of ≥ 1 in the PSS **AND** ≥ 2 in the PIS are the criteria for successful treatment for a ***systemic*** therapy. In this study two elbows were treated ***locally*** and the same criteria for a systemic therapy success may not be applicable for a one time local treatment of both elbows. Therefore, if there was improvement in the PSS ≥ 1 **OR** PIS ≥ 2 with no worsening of the other value this was also considered a successful treatment from the caretakers point of view.

Improvement of:	Comparison		Outcome
PSS >=1 **and** PIS >=2	Baseline to Day 90	Success	3/9 (33.3%)
		Failure	6/9 (66.7%)
	Baseline to Day 180	Success	2/9 (22.2%)
		Failure	7/9 (77.8%)
	Baseline to Day 270	Success	3/8 (37.5%)
		Failure	5/8 (62.5%)
	Baseline to Day 365	Success	3/8 (37.5%)
		Failure	5/8 (62.5%)
	Day 90 to Day 180	Failure	9/9 (100.0%)
	Day 180 to Day 270	Success	1/8 (12.5%)
		Failure	7/8 (87.5%)
	Day 270 to Day 365	Failure	7/7 (100.0%)

Improvement of:	Comparison		Outcome
PSS >=1 **or** PIS >=2	Baseline to Day 90	Success	5/9 (55.6%)
		Failure	4/9 (44.4%)
	Baseline to Day 180	Success	4/9 (44.4%)
		Failure	5/9 (55.6%)
	Baseline to Day 270	Success	4/8 (50.0%)
		Failure	4/8 (50.0%)
	Baseline to Day 365	Success	6/8 (75.0%)
		Failure	2/8 (25.0%)
	Day 90 to Day 180	Failure	9/9 (100.0%)
	Day 180 to Day 270	Success	2/8 (25.0%)
		Failure	6/8 (75.0%)
	Day 270 to Day 365	Success	2/7 (28.6%)
		Failure	5/7 (71.4%)

Results: Force Plate

Force plate evaluation demonstrating ≥5% improvement in PF or IMP in either elbow was seen in 55.6% of subjects at 90 days, and 66.7% of subjects at 180 days.



Results: Clinical Assessment of Lameness

No statistically significant differences were found within group, however, there was statistical agreement using McNemars test between the clinicians' lameness assessment and the cBPI scores.

Conclusions

The therapeutic success and safety of reinjection using homogeneous Sn-117m colloid for OA in dogs provides support for similar use in humans.