

Preliminary Results of Radial Extracorporeal Shock Wave Therapy as a non-invasive Treatment of Degenerative Musculoskeletal Disorders in Dogs

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Introduction: Radial Extracorporeal Shock Wave Therapy (RSWT) is often successfully used in humans and equines with degenerative musculoskeletal diseases. The effect of RSWT as a treatment modality for degenerative musculoskeletal disorders in dogs was analysed by force plate analysis.

Material and Methods:

Dogs: Twenty-four dogs of different breeds were included in this study. Three dogs had a tendiopathy of the supraspinatus and infraspinatus, respectively biceps tendon, 5 dogs a cubarthrosis, 4 a gonarthrosis and 12 a coxarthrosis. For details of gender and age see table 1.

	Tendiopathy	Cubarthrosis	Gonarthrosis	Coxarthrosis
n	3	5	4	12
male/female	3	2	3	6
Age	7,33 +/- 3,21	8,20 +/- 2,17	8,00 +/- 2,71	6,58 +/- 3,63
Gender	3 female	2 female 4 male	3 female 1 male	5 female 7 male

Table 1: Age and gender of included dogs



Fig. 1, 2: Treatment with the Swiss DolorClast Vet

RSWT: RSWT has been performed using the Swiss DolorClast Vet (EMS Electro Medical Systems, Nyon, Switzerland). All animals received 3 treatments in a weekly interval. In each session, between 1000 and 2000 impulses at a frequency of 15 Hertz and a pressure of 2.0 bars were administered to the tissue over the targeted area (Fig. 1 and 2). RSWT was performed without sedation or anesthesia.

Force plate analysis: Ground reaction forces (GRF) were evaluated before each treatment and one month after the 3rd RSWT, using a treadmill system with four force plates (Kistler® Instrument Corporation, Ostfildern, Germany) (Fig. 3). Velocity of the treadmill was 1.14 to 1.22 m/sec. Data from 5 valid steps was analysed using SIMI Motion Data Force (SIMI Reality Motion Systems, Unterschleißheim, Germany). Peak Maximal Force (Fz), Mean Vertical Force (Fm) and Impulse were evaluated. All values were normalized with respect to the dog's bodyweight and expressed in percent of bodyweight (%BW). From all values symmetry indices were calculated and deviation of absolute symmetry was expressed as a percentage.



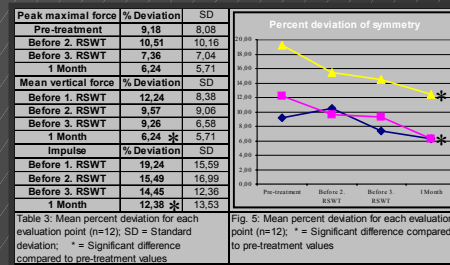
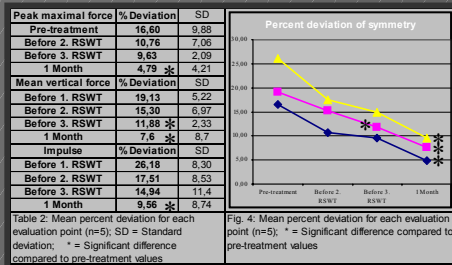
Fig. 3: Treadmill with four force plates

Statistical analysis: For the dogs with coxarthrosis and cubarthrosis a paired t-test was performed to compare pre-treatment values with values at each evaluation point, p<0.05 was considered as statistically significant.

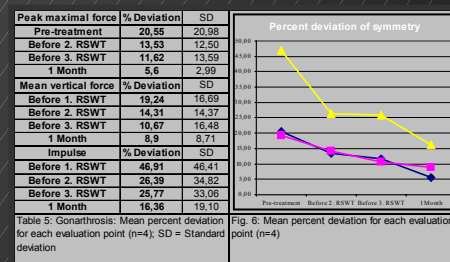
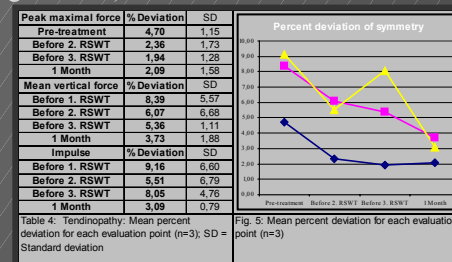
Results:

Cubarthrosis: In all dogs an improvement of deviation of symmetry was found at one month after last RSWT with a statistically significant difference of all evaluated parameters compared to the pre-treatment values. (Tab. 2, Fig. 4)

Coxarthrosis: Significant improved values compared to the pre-treatment values were found one month after the third RSWT for mean vertical force and impulse, whereas Peak Maximal Force didn't improved significantly. (Tab. 3, Fig. 5)



Tendiopathy and Gonarthrosis: With respect to the low number of animals no statistical analysis was performed for these disorders. However, ground reaction forces of these patients showed a positive tendency over the treatment period. (Tab. 4 and 5, Fig. 6 and 7)



Discussion/Conclusion:

Our preliminary results indicate an improvement of ground reaction forces of dogs with musculoskeletal disorders undergoing Radial Extracorporeal Shock Wave Therapy. Although studies with more homogenous groups, larger patient numbers and long-term follow-ups are needed, RSWT might be an effective non-invasive treatment modality for patients with musculoskeletal disorders.

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