

## **The Effect of Occlusal Equilibration on Sport Horse Performance (Dressage)**

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### **Take Home Message**

Occlusal equilibration performed on dressage horses had no significant positive effect on performance as determined by blinded, experienced dressage judges.

### **Introduction**

Modern reference texts cite dental disease as being responsible for a multitude of systemic problems in the horse, as well as a cause of poor performance.<sup>1,2</sup> The scientific evidence for some of these statements is lacking. The authors of previous studies have theorized that rostral-caudal mobility of the equine mandible is an important aspect of performance, especially in those equine disciplines that require extreme poll flexion, such as dressage.<sup>3</sup>

### **Materials and Methods**

A randomized, controlled, blinded, prospective crossover design protocol was followed using eleven horses that had not had a dental examination or floating performed for at least 12 months prior to test date (floated) and five horses that had routine dental care performed (every 6 months). National Federation (Equine Canada)-approved standard dressage tests 1A and 1B were used.

All horses were ridden by a single, certified test-rider, in front of two experienced dressage judges. After testing, all horses were sedated, the amount of rostral-caudal mobility (RCM) of the mandible was determined, and the oral cavity examined with the aid of a full-mouth speculum. A dental disease score was assigned using previously published techniques. Horses in the treatment group received dental floating, including the removal of sharp enamel points, hooks, ramps and stepped teeth (if present) using a motorized dental instrument.<sup>a</sup> The dental instrument was operated in the mouths of horses in the control group for the mean time taken to float the treatment group, but the instrument was not allowed to touch the teeth.

Forty-eight hours later, all horses performed the opposite of the two tests, ridden by the same rider, in the same order-of-go, and scored by the same judges, who were all blinded to treatment group.

### **Statistical Analysis**

Multivariate statistical analysis was performed using a computer-based program (Statistix)<sup>b</sup>. Level of significance was set at  $p < 0.05$ .

### **Results**

RCM was significantly improved in treated horses, increasing by a mean of 1.5mm (range=0-4mm) following occlusal equilibration. No increase was seen in the control group. Mean dental disease score in treated horses was 3.8 (range=2-6) and was not significantly different from control horses (3.0, range=1-5).

Overall, total judge scores were lower on Day 2 than on Day 1, but the differences in scores were not statistically significant, and control horses did not score differently between days ( $p > 0.35$ ). Judge 2 found a significant negative difference in treated horses (after occlusal equilibration), on Day 2 ( $p = 0.017$ , mean change = - 3.32); this difference, however, was not mirrored by Judge 1, who found no significant difference ( $p = 0.96$ ).

There was no significant association between RCM and test score or between RCM gain following occlusal equilibration and difference in test score on Day 2 from either judge. Dental disease score was not associated with total score on either day.

### **Discussion**

The use of the control horses in our study indicated that there was not a day effect, and therefore, we were confident that any difference in the performance of treated horses would be due solely to a treatment effect. One judge, however, found no difference in performance between the treated and untreated horses, but the other found that treated horses performed significantly worse after occlusal equilibration. This inter-judge difference renders it difficult to state with certainty that occlusal equilibration did or did not affect performance in the dressage horse.

Possible reasons for a negative result include persistence of oral pain, despite the removal of dental malocclusions, in which case, our study interval may have been too short, or pain associated with the dental procedure, which negated beneficial effects.<sup>4</sup> Other explanations may be that the *severity* of lesions present did not cause sufficient (or any) oral discomfort to affect performance, or that the *number* of lesions was insufficient to affect performance. Similarly, oral proprioception in the horse may be as acute as that in human beings and may contribute to balance and performance, alteration of which could mask potential benefits of occlusal equilibration in the short-term.<sup>5</sup>

In designing this study to determine the effect of occlusal equilibration on dressage performance, it is possible that unfair bias against treatment occurred. Horses (with a

treatment interval of 12 months) performed the most basic standard test under the guidance of an experienced test rider, and we were attempting to reveal a small, but significant treatment effect. The use of horses in which the treatment interval was greater, the use of double bridles or having horses tested at a more demanding level may have furnished different results.

In summary, occlusal equilibration performed in these dressage horses (with a treatment interval of one year had no significant positive impact on performance as determined by blinded, experienced dressage judges. Despite stated limitations of the study, it is unique in its field and represents the first attempt to corroborate the perceived versus actual benefits of occlusal equilibration on the equine sport horse. Further studies using a larger number of horses at different levels and types of competition, in similarly rigid testing situations are needed.

### References and Footnotes

1. Jones SL. Oral diseases. In: Reed, Bayly and Sellon, eds. *Equine Internal Medicine* 2<sup>nd</sup> ed. Philadelphia: W.B. Saunders, 2004; 848.
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3. Carmalt JL, Townsend HGG and Allen AL. A preliminary study to examine the effect of dental correction on rostral-caudal mobility of the equine mandible. *J Am Vet Med Assoc*. 2003; 223: 666-669.
4. Kempson SA, Davidson ME and Dacre IT. The effect of three types of rasps on the occlusal surface of equine cheek teeth: a scanning electron microscopic study. *J Vet Dent* 2003; 20: 19-27.
5. Nobili A and Adversi R. Relationship between posture and occlusion: A clinical and experimental investigation. *Cranio* 1996; 14: 274-285.

<sup>a</sup> PowerFloat, D&B Equine Enterprises Inc., 207 Silverhill Way N.W. Calgary, AB, T3B 4K9 Canada.

<sup>b</sup> Analytical Software Inc., PO Box 12185, Tallahassee, FL, USA.