

ABSTRACT

Scientific Presentation Abstracts

2021 ECVS

July 08-10, ONLINE

LARGE ANIMAL RESIDENT'S FORUM - LARGE ANIMAL

Electromyographic Study of the Sternomandibularis Muscle Ahead of Laryngeal Reinnervation with the Spinal Accessory Nerve

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Objectives: The sternomandibularis muscle is a long fusiform muscle ventrolateral to the trachea responsible for head and neck flexion. Motor innervation is provided by the ventral branch of the spinal accessory nerve. Our objective is to conduct an electromyographic study of the sternomandibularis muscle in order to gather normative data in horses at rest and during exercise. Muscle recruitment, relative to posture, gait and respiratory cycle, will be determined from electromyographical signals of the sternomandibularis muscle activity induced by physiological accessory nerve stimulation.

Methods: Surface electromyography of the sternomandibularis muscle was performed in warmbloods, trained thoroughbreds and standardbreds. The myoresearch software was run with sensors for the left and right sternomandibularis muscle, a ground sensor, an accelerometer and a pharyngeal pressure recording sensor. Electromyography was performed in different feeding postures and at exercise, which included standardized treadmill exercise tests, lunged and ridden work in different head neck positions.

Results: Qualitative signal analysis enabled to identify patterns in the timing and magnitude of sternomandibularis muscle contractions. The sternomandibularis muscle is strongly activated when the horse is grazing. At trot, the muscle contracts in phase with the stride. At gallop,

contraction is not only correlated with timing of the stride but also the respiratory cycle. Signal amplitude increases with speed.

Conclusions: On top of the anatomic proximity of the spinal accessory nerve to the larynx, this study puts forward electrophysiological advantages to grafting the spinal accessory nerve to the cricoarytenoideus dorsalis muscle in selected cases of laryngeal hemiplegia.

Prevalence and Characteristics of Osteochondrosis in Lusitano Purebred Horses

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Objectives: This is the first comprehensive study in Lusitanos that aims to study the radiographic prevalence and localisation of osteochondrosis in different joints.

Methods: A radiographic protocol of the metacarpo/metatarsophalangeal, tarsocrural and femoropatellar joints was done in 302 Lusitanos, and findings were classified using a 0-4 scale: 0 - normal joint contours; 1 - minimal (minimal and smooth flattening); 2 - mild (irregularly flattening); 3 - moderate (presence of a small fragment, presence of a small rounded defect) and 4 - severe (large or multiple fragments, with a large irregular defect). Scores 1 and 2 were considered to represent OC while scores 3 and 4 corresponded to OCD

Results: Abnormal findings were present in 53.31% of the horses. Most were stallions (88.74%), and the mean

age was 5 ± 2.48 years (range of 1 to 12 years old). The prevalence of OC (36.75%) was higher than OCD (16.56%). The most affected joint were hocks (39.73%), followed by fetlocks (26.48%) and stifles (3.3%). OC was registered in 34.43% in hocks, 14.9% in fetlocks and 2.31% in stifles. The presence of fragments (OCD) was recorded in 6.95% of the cases in the hock, 8.93% in the fetlocks and 1.65% in the stifle.

Conclusions: This Lusitano horse population has presented a high prevalence of osteochondral lesions, with a low prevalence of OCD. This study is important to ensure a rational use of Lusitano and a prospective study is required to determine the genetic variability regarding OC/OCD in this breed.

Evaluation of Villous Synovium from Unaffected Metacarpophalangeal Joints of Adult and Juvenile Horses

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Objectives: Synovial explants are increasingly used in in vitro studies using the equine species as a model for orthopaedic research such as osteoarthritis. Further, histological analysis of the synovial membrane is also considered as the gold standard in clinical trials as the synovium is involved in the initiation and progress of joint diseases. To establish possible disease and age-related parameters for future histological analysis, the study aimed to evaluate the mean intimal lining dimensions, cellularity and the vascularization of equine villous synovium of non-affected metacarpophalangeal joints in juvenile and adult horses.

Methods: One hundred synovial samples from villous synovium of non-diseased metacarpophalangeal joints from juvenile and adult horses were analyzed. Digitalization of histological slides was followed by the analysis of the following parameter: intimal synovial lining dimension, cellularity of the intimal synovial lining and vascularity of the subintimal layer.

Results: The width of the intimal synovial layer did not show significant differences between juvenile and adult horses. Differences were seen in the number of cells

composing the intimal synovial layer and regarding the vascularity of juvenile and adult horses.

Conclusions: This study provides detailed histological references of non-affected villous synovium of the metacarpophalangeal joint in juvenile and adult horses for future in vivo and in vitro studies. Age-related differences regarding intimal synovial layer dimensions, cellularity and vascularity must be considered when equine synovium is used for histological studies. It has to be proven whether the metacarpophalangeal joint is representative of other diarthrodial joints.

Ex Vivo Comparison of Single Layer interrupted, Single Layer Continuous and Double Layer Suture Techniques for Equine Jejunal End-to-End Anastomosis

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Objectives: An important factor related with post-operative complications after small intestinal resection in horses is the technique of creating the anastomosis. The objectives of this study were to evaluate differences in construction time, lumen reduction and leakage resistance between a single layer interrupted modified Lembert (SI) according to Freeman, a single continuous modified Lembert (SC), and a double layer simple continuous with Cushing oversewn (DC).

Methods: Jejunum of slaughtered horses were used for performing the anastomosis (n=27 for each group). Intestines were filled with contrast agent and distended with air at 500 ml/min. Radiographs were taken at 20 mmHg intraluminal pressure. Luminal reduction was calculated in percentages. Leaking pressure was recorded when air bubbles appeared. Statistics were performed using linear mixed models with a post hoc Tukey method (P<0.05). Results are presented as least square means.

Results: The SC pattern took significantly less time to create than SI and DC (16.7; 21.1; 22.3 minutes, respectively). SI and DC construction times were not significantly different.

SI resulted in least lumen reduction (27.2 %), DC gave most reduction (47.2 %) and SC in between (32.2 %). Differences were significant between all 3 groups.