Muscle/Ligament Assessment

Date: ……17th July 2019……..

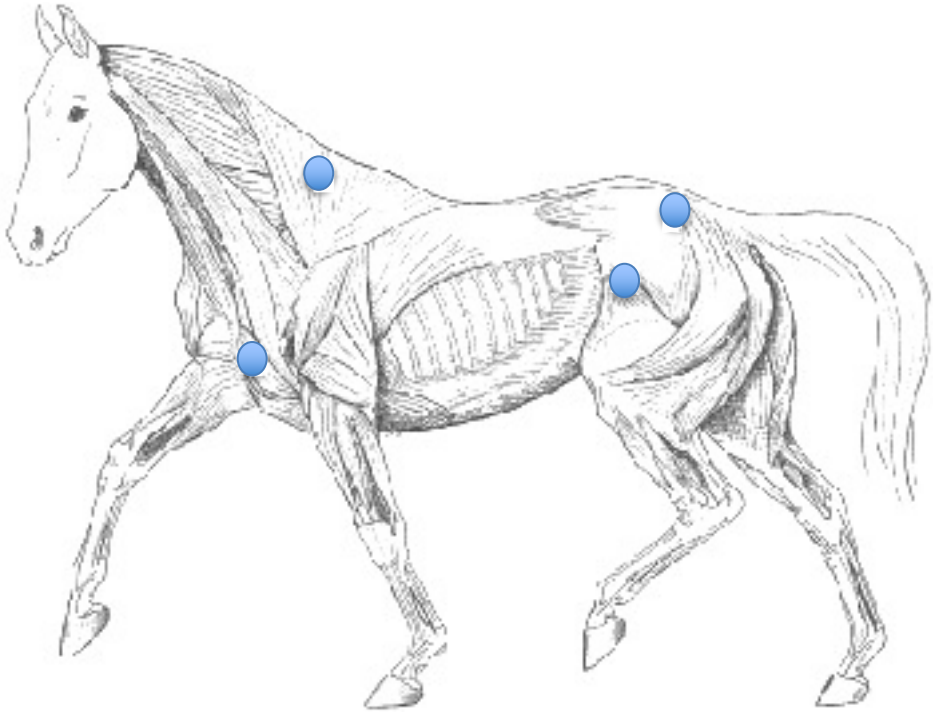
Owner: …Ref: XYZ……..

Horse: ……..Case #1……..

Muscle:

Ligament:

Discipline: Training? .. Neuromuscular Horse



Data Files: The AMG measurements were made for the muscles trapezius, pectoralis, gluteus medius and tensor fasciae latae. These muscles were measured during walking only on a hard surface and on grass (with stepping over a pole).

Findings: The AMG data reveal an imbalance in the trapezius and tensor fasciae latae muscles (overuse of the right-hand side). Interestingly there is no change in the T-score during walking *cf* healthy control horses. However, the S-score in this neuromuscular problem horse was much lower than that of healthy control horses. The ST-score was also lower than that of healthy controls – weaker muscles.

Comments: These are interesting findings, indicating that neuromuscular problems seem to be associated with a lower E-score and S-score *cf* healthy control values, and a lower ST-score, yet a comparable T-score. These observations represent only 1 horse and more data is now needed. However, there appears to be a basis for a differential diagnosis, as well as a means of following recovery.

In consultation with DVM Xyz - Oklahoma, USA.

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Muscle data for Case #1 – with comments

	Walk		ST	Balance	Comment
	Left-side	Right-side			
Pectoralis	E=3.6 S=5.6 T=7.2	E=4.1 S=5.4 T=6.3	6.4/5.8	0.6	Fairly well balanced
Trapezius	E=3.3 S=3.2 T=7.1	E=2.2 S=0.7 T=6.5	5.1/3.6	4.2	Overuse of right side
Tensor F L	E=3.5 S=4.5 T=6.5	E=1.3 S=3.0 T=7.5	5.5/5.2	2.7	Overuse of right side
Gluteus M	E=3.8 S=4.8 T=6.2	E=4.2 S=4.2 T=7.3	5.5/5.7	-0.9	Slight overuse of left side

Typical Values: walking – E-score = 5.6; S-score = 8.9; T-score = 6.8; ST-score = 7.8

Summary:

- Imbalance in m. trapezius and m. tensor fl – relative balance between m. pectoralis and m. gluteus m
- Generally weaker muscle use (lower ST) than healthy control values (5.3 *cf* 7.8)
- T-score of 6.2 = 61 Hz and 7.5 = 40 Hz (T-score of 6.8 = 51 Hz)
- T-scores commensurate with healthy control values – temporal summation NOT affected
- S-scores lower than healthy control values (3.9 *cf* 8.9) – spatial summation affected (more motor units active)
- E-scores lower than healthy control values (3.2 *cf* 5.6) – less coordinated movement (muscle active more of the time)

For iPad traces, see next page:

NB: The AMG signal has been shown to correlate with muscle force when the S-score and T-score are combined to produce a ST-score - Physiol Rep, 6 (1), 2018, e13580, https://doi.org/10.14814/phy2.13580

WALK: m. gluteus m and m. tensor fasciae latae

Muscle/Ligament Assessment

WALK: m. pectoralis and m. trapezius

NB: The AMG signal comprises three physiological parameters, namely efficiency/coordination (E-score), spatial summation (S-score) and temporal summation (T-score).

The E corresponds to the periods of active/inactive function relative to the duration of the activity period of the muscle (how long the muscle is "on"), S in terms of muscle reflects the recruitment of motor units and equates to signal amplitude (how many motor units are active), and T is the motor unit firing rate or signal frequency (how fast the motor units are firing).