Fascial connections of peripheral nerve of the horse

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BACKGROUND: Hypothesis of this study was that peripheral nerves, which are attached to fascial sheets are affected by the movement and tension of the fascia. Detailed macro- and microscopical studies were performed to validate the structural and functional connections between peripheral nerves and fascia.

METHOD: 10 horses were euthanized for other reasons but the study. The hind limb was dissected to evaluate the connection between peripheral nerves and fascia. Tissue samples from other regions were prepared for histological studies. Fascia and nerve connections and attachments were recorded as still fotos and video.

RESULTS: The macroscopical studies showed e.g. that the superficial peroneal nerve was tightly attached to the profound fascia, and that the crural fascia provided a flexible layer protecting the nerve trunk. Gliding of the profound fascial layers over the nerve was facilitated by a layer of loose connective tissue. The superficial peroneal nerve was attached to the epimysium of m. tibialis cranialis and therefore restricted to move between the fascia layers. This strict epineurial attachment to the fascial layer was also observed in the histological sections. Additionally the dissection studies showed that the mobility of the nerve was limited to the elasticity of the attached fascial layer surrounding it. The movement of the nerve was altered and restricted, when compression was applied to the fascia above or below the nerve trunc.

CONCLUSION: The plasticity of fascial layers affects the mobility of peripheral nerves. This knowledge might support the explanation why myofascial dysfunctions and movement restrictions can influence on peripheral nerve mobility. The plasticity of fascial layers affects the mobility of peripheral nerves. This knowledge might support the explanation why myofascial dysfunctions and movement restrictions can influence of the peripheral nerve mobility.