

DIAGNOSTIC IMAGING OF LUMBOSACRAL STENOSIS AND CERVICAL SPONDYLOMYELOPATHY. Nele Ondreka - University of Giessen, Germany, 35392. Nele.Ondreka@vetmed.uni-giessen.de

Despite affecting very apart locations along the spine and multiple other differences lumbosacral stenosis (LS) and cervical spondylomyelopathy (CSM) have certain things in common. Both diseases typically occur in middle aged to older large breed dogs with specific breeds being overrepresented and lead to a complex clinical syndrome comprising pain and a range of associated facultative neurologic deficits. The clinical course of both LS and CSM is usually slowly progressive.

German shepherd Dogs are by far most affected by LS. Predisposing factors such as lumbosacral transitional vertebrae, sacral osteochondrosis, primary vertebral canal stenosis and step formation are overrepresented in German shepherd Dogs. Moreover, the lumbosacral intervertebral disc degeneration is accelerated in German shepherd Dogs compared with other non-chondrodystrophic breeds. New research also focuses on lumbosacral motion patterns and potential instability – their relevance has been discussed for many years. However, to date data taking natural posture and locomotion into consideration are lacking. Kinematics of the lumbosacral junction under natural conditions and population genetics of predisposing factors are therefore main interests of our research at the University of Giessen.

It is known that degeneration and protrusion of the lumbosacral intervertebral disc has a central role in the development of clinical signs. Whilst predisposing conditions such as lumbosacral transitional vertebrae and osteochondrosis can be identified radiographically the sensitivity of radiographs for disc degeneration, disc protrusion and nerve root compression is low to non-existent. Cross sectional imaging methods such as Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) – the latter being the ideal to depict and stage disc degeneration and the situation of the Cauda equina nerve roots – are required in the clinical diagnosis of LS and Cauda equina syndrome (CES). It is known however, that even though CT and MRI findings correlate well with each other they do not necessarily correlate with the severity of clinical signs. Synthesis of typical clinical and MRI findings therefore is the standard diagnostic algorithm for LS and CES in a clinical environment.

CSM is represented by a complex of degenerative changes of the cervical spine which have been referred to as Wobbler syndrome owing to their similar clinical picture. Compression of cervical spinal cord segments is associated with spinal ataxia and tetraparesis. More than 50 % of the dogs experience permanent or transient pain upon cervical motion. Large and giant breed Dogs beyond the age of 7 and 4 years respectively are typically affected. Doberman and Great Danes are overrepresented. A different pathogenesis between large and giant breed Dogs has been proposed. Giant breeds suffer from primary stenosis of the cervical vertebral canal owing to osseous vertebral malformation while large breed Dogs typically show disc associated spinal cord compression. Static and dynamic types of compression are both possible. The most common site of compression is C5-6 and C6-7. Chronic compression may be associated with irreversible spinal cord atrophy or gliosis. The diagnosis of osseous changes can be obtained using x-ray based techniques such as radiography and CT. Myelographic techniques allow for the diagnosis of dynamic compression and traction responsive disc protrusion which is crucial in the decision making process regarding the optimal therapeutic approach. Surgical technique needs to be adjusted thoroughly to the type of disease and compression – the compression from a dorso-lateral direction in osseous CSM with facet joint hypertrophy being one example as opposed to disc protrusion with compression from the ventral aspect of the vertebral canal.

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Detailed assessment of the degree of compression, clinical relevance and duration of compressive conditions and presence of neural parenchymal changes vastly benefits from MRI where volume and signal intensity changes of the spinal cord are seen directly, acute components can be ruled out. Moreover, estimation of the overall prognosis and decision making in cases with multiple sites of protrusion is facilitated by the detailed information that can be retrieved from MRI studies.