

## **WHICH LESIONS CHARACTERIZE « SPINAL SUB-ARACHNOID CYSTS »? STUDY IN 11 DOGS.**

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**Introduction :** Spinal arachnoid cysts are described, in animals, as a localized enlargement of the sub-arachnoid space observed by myelography. The exact nature of the lesion and its pathogenesis still remains controversial, despite the use of various imaging techniques. The purpose of our study was to improve the characterization and understand the pathogenesis of this subarachnoid lesion through a prospective study.

**Material and methods:** Eleven dogs, including 6 Rottweiler dogs, with a mean age of 2.7 years, presenting clinical signs related to spinal cord dysfunction and with myelographically-confirmed subarachnoid cavitations, were investigated. All patients underwent preoperative myelography, only four had computed tomography (CT), while one had magnetic resonance imaging (MRI) with CSF-flow study (velocimetry) and three had post-surgical sonography.

**Results:** The locations of the lesions were cranial cervical in 6 cases, caudal cervical in 1 case, mid-thoracic in 2 cases and thoraco-lumbar in 2 cases. The extent of the lesions was 20 to 55 mm (i.e. one to two vertebra in length). The enlargement of the subarachnoid space was located dorsal to the spinal cord in 9 patients, dorsal and ventral in 2 patients and dorso-lateral in 1 patient. CT-scan (plain or following intra-theal contrast medium injection) confirmed spinal cord diameter reduction in 4/4 cases and suggested ventral deviation of the spinal cord. The space between the leptomeninges appeared dilated dorsally. MRI demonstrated signs of ventral adhesions of the spinal cord in one additional case. MRI dynamic exploration of cerebrospinal flow confirmed the presence of a subarachnoid space dilatation normally communicating with surrounding CSF space. No turbulences nor modifications of fluid discharge speed could be established. No associated spinal cord abnormalities could be detected. Explorative surgery was performed in all dogs ; four dogs were evaluated per-operatively for the presence of meningeal adhesions or inflammatory lesions. Adhesions, opposite to the enlarged space, were observed in all cases and inflammatory or sclerotic lesions were confirmed histologically in 2/3 cases. Post-surgical sonography assessed surgical efficiency, adhesions release or recurrence, and confirmed the absence of cystic neoformations, haematomas or spinal cord abnormalities.

**Conclusion :** This study confirmed the preferential location of this enlarged space in the cranial cervical region. Imaging and surgical findings determined the absence of any epithelial membrane between CSF-containing compartments. A compressive spinal cord lesion caused by a « cyst » under pressure thus appears questionable. Chronic ancient inflammatory reactions causing meningeal adhesions and intra-canalicular architectural reorganization could contribute to the pathogenesis. Repeated micro-traumas, creating inflammation in spinal areas subjected to severe constraint and a high level of mobility, such as the cranial cervical region, could induce adhesions and secondary enlargement of the subarachnoid space, and therefore could be involved in the initiation of the lesion. The over-representation of Rottweiller dogs in our series suggests an influence of genetic predispositions which may be linked to the dog's conformation (weight of the head for example).