Cervical Spinal Cord Injury Modifies Distal Lumbar Locomotor Central Pattern Generator (CPG)

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Cervical Spondylotic Myelopathy (CSM)

• Commonest cause of spinal cord impairment in adults worldwide (Young 2000)

• Chronic progressive compressive injury of the cervical spinal cord

• Gait disruption represents one of the cardinal clinical manifestations of CSM
• the commonest cause of spinal cord impairment in adults worldwide

Material Implantation in mouse cervical spine
Neuronal injury at the site of compression in human & mouse CSM

Yu et al. 2011, *Brain*
CSM mice and humans exhibit similar to locomotor deficits

Mice Gait Analysis

Sham

CSM

Base of Support

Stride Length

Human Gait Analysis

Control

CSM

Base of Support

Stride Length
CSM mice and humans exhibit imbalance of flexor/extensor coordination
Progressive loss of interneurons (INs) and motoneurons following CSM

ChAT-GFP
Morphological properties of lumbar neurons

Sham

CSM

ChAT-GFP
Morphological properties of lumbar neurons
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