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Optimized diagnosis of Tethered Spinal Cord (TSC) with MRI in prone position

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Introduction: Tethered Spinal Cord (TSC) is a complex group of spinal dysraphisms. Clinical symptoms can range from back pain with radicular radiation, stress-related pain, gait disturbance, bladder problems or complete paraplegia. The diagnosis of tethering, especially of secondary origin, is often difficult and conventional MRI diagnostics in supine position are insufficient. We tried to demonstrate the lack of mobility of the conus medullaris with an additional MRI in prone position.

Methods: 40 patients between 01/2011 and 08/2013, average age 11,3 years (range 4 months - 40y) involving 21 males and 19 females, with neurological symptoms suspicious for a TSC were examined with a MRI in supine and prone position. 17 of these patients had a thick filum terminale, 3 lipomyelomeningocele (LMMC), 15 secondary tethering after operation of occult dysraphism, 5 without pathologic MRI.

Results: In 35 (87,5%) patients with typical symptoms of a TSC the diagnosis could be confirmed by prone MRI due to the persistent posterior displacement of the conus, 27 (77,1%) of these patients were successfully untethered. Tethering could be excluded in 5 patients (14,3%).

Discussion: The new method of prone-position MRI can show differences in the elasticity and decreased mobility of the conus medullaris in TSC and can therefore easier confirm the diagnosis and rule out misdiagnosis.