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CASE REPORT

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Tethered cord syndrome: case report

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Summary

Background: Tethered cord syndrome is one of the filum terminale congenital defects. It can coexist with anomalies of the spinal canal and column, as well as with anorectal defects.

Case report: The authors present a case of tethered cord syndrome diagnosed in a 45-year-old woman. She showed typical lumbo-sacral radicular syndrome with no neurological deficits and no bowel/bladder dysfunction. The anomaly coexisted with fibrolipoma, spina bifida and Tarlov cyst.

Conclusions: Magnetic resonance imaging is the method of choice in diagnostics of tethered cord syndrome. It provides crucial information, which is necessary for planning surgical treatment of the anomaly.

Key words: tethered cord syndrome • spina bifida • fibrolipoma • MRI • CT

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Background

Primary tethered cord syndrome is a rare developmental disorder of filum terminale and is one of the latent dysraphic disorders of spinal cord and canal [1, 2, 3]. It can coexist with other anomalies of the final segment of spinal canal and anorectal dysfunctions, or occur secondarily, as a complication of surgical procedures.

In diagnostic imaging, the method of choice is the magnetic resonance tomography. Computed tomography is an important supplement in evaluation of coexisting disorders of bone structures in the spine. The use of ultrasonography is limited to children in the first 6 months of life.

Surgical release of tethered cord is performed in cases of elevated clinical symptoms or their obvious progress. The operation is usually based on releasing the cord and nerve roots from fibrosis and resecting coexisting tumors [4].

Case report

Female patient aged 45, who complained of moderate pain of the spine in lumbar segment, without obvious anomalies in neurological examination, without sphincter dysfunction.

A routine computed tomography examination (slices of 3 mm within the intervertebral spaces L3/L4, L4/L5 i L5/S1) showed protrusions of intervertebral discs on two lower levels. Moreover, on L5/S1 significant widening of spinal canal with spina bifida was found.

The magnetic resonance tomography performed subsequently (GE Signa 1.5T, sequences FSE and GRE, T1 and T2- weighted images in transverse and sagittal plane) confirmed degenerative lesions of intervertebral discs L4/L5 and L5/S1 and central protrusion of the intervertebral disc (Th12/L1) was also observed. Presence of spina bifida with spinal canal widening (in transverse dimension – max 40 mm) was confirmed as well. Typical signs of tethered cord syndrome were also visualized: extremely low spinal cord (to the level of L4/L5) without a typical terminal cone, difficult to circumscribe from thickened terminal filum (fig. 1). On the S1/ S2 level, presence of fibrolipoma connected to terminal filum was found intrameningeally; it was adjacent to posterior-lateral outline of dural sac and did not surpass the spinal canal. Moreover, perineural cyst (Tarlov's) was found on S1/S2 on the right side (fig. 2).

For a more precise visualization of bone structures of spina bifida an additional CT scan was performed in spiral option (GE HiSpeed Dual, slices 3mm) and was completed with plane reformations and 3D Volume rendering (fig. 3).

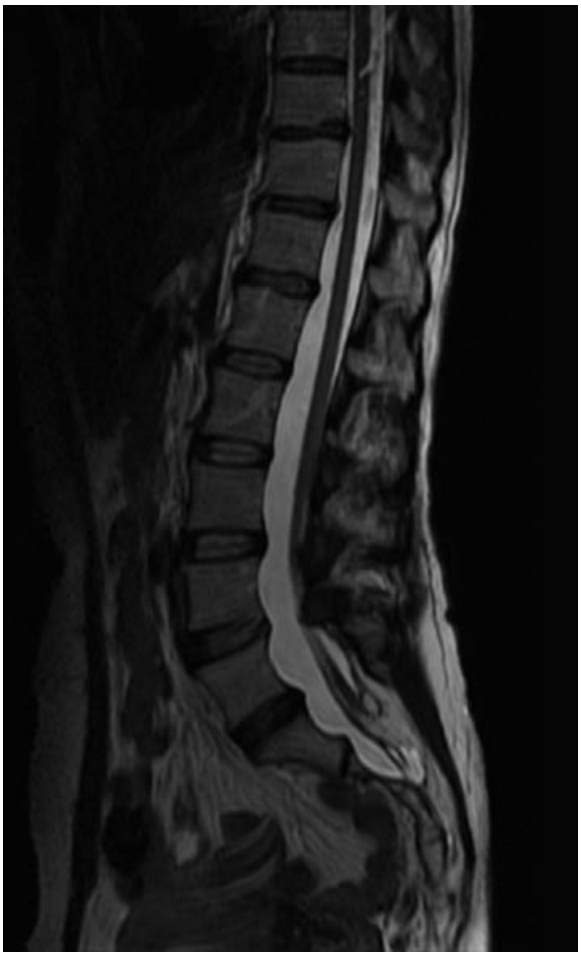

Figure 1. MR, FSE, T2-weighted image, sagittal projection. Tethered cord with thickened filum terminale. Intradural fibrolipoma.

Discussion

The primary tethered cord syndrome is one of the latent dysraphic disorders of the spinal cord and canal which affect the filum terminale [1, 2, 5]. The most common anomalies coexisting with tethered cord are spina bifida, which occurs in almost all cases, and lipoma or fibrolipoma found in 1/3 of cases. Less frequent are: syringomyelia, diastematomyelia, nevuses and vascular anomalies in sacral area. The tethered cord syndrome diagnosed in neonates and children most often coexists with developmental anomalies in sacral area and the end part of alimentary tract, usually in form of proctatresia [5, 6, 7].

Secondary tethered cord syndrome can manifest as a complication of surgical procedure, especially correction of dysraphic anomalies in the spinal cord, chronic inflammatory lesions or tumors in spinal canal [5, 7].

The tethered cord is less elastic and is devoid of physiological mobility during the moves of the spine. Chronic mechanic injuries focus mainly in the end part of the cord and result in dysfunctions of blood supply in microcirculation, what often leads to myelopathy.

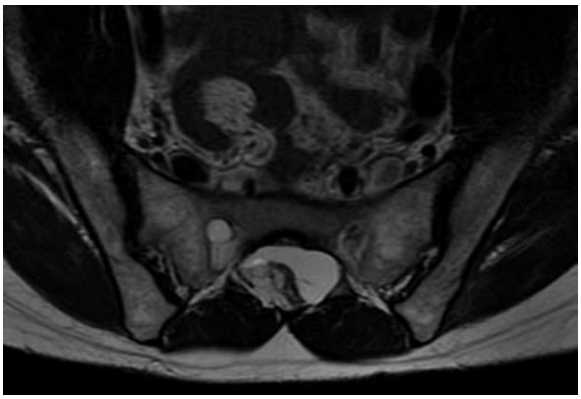

Figure 2. MR, FSE, T2-weighted image, axial projection. Spina bifida. Fibrolipoma of the filum terminale. Tarlov cyst.

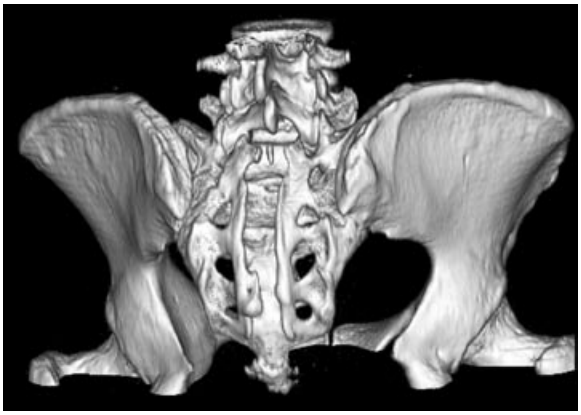

Figure 3. Computed tomography. 3D Volume Rendering. Spina bifida.

Moreover, clinical symptoms can be a consequence of atypical course of nerve roots, often immobile within the fibrosis.

The primary tethered syndrome with poor symptoms or slowly increasing dysfunctions is usually diagnosed in adulthood. The most common clinical symptoms include pains and diaesthesia in lumbar area radiating to lower limbs. Less frequent are motor deficiency signs or fecal and urinary incontinence; an untreated disorder in long-term course can lead to neurogenic bladder.

Conclusions

Magnetic resonance tomography is a method of choice in diagnosing the tethered cord syndrome. The diagnosis is based on visualization of thickened filum terminale which joins spinal cord (devoid of lumbar thickening and typical terminal cone) on the level below L2/L3 intervertebral space. The examination also enables to show atypical course of nerve roots and visualize the coexisting anomalies of spinal canal.

- Computed tomography is mainly used in imaging the bone structures of the spine, especially spina bifida.
- Surgical treatment is based on cutting the thickened filum terminale, release of the spinal cord and nerve roots from fibrosis and resection of coexisting lipoma.

References:

1. Sikorska J, Walecki J, Jurkiewicz E et al.: Wady dysraficzne końcowego odcinka kanału kręgowego i rdzenia w badaniu rezonansu magnetycznego. Rez Magn Med 1997; 5(1): 38–52.
2. Bächli H, Wasner M, Hefti F: Intraspinale Missbildungen – Tethered Cord Syndrom. Orthopäde 2002; 31: 44–50.
3. Kothbauer K, Seiler RW: Das Tethered-spinal-cord Syndrom beim Erwachsenen, Nervenarzt 1997; 68: 285–291.
4. Koyanagi I, Iwasaki Z, Hida K et al.: Surgical treatment supposed natural history of the tethered cord with occult spinal dysraphism. Child's Nerv Syst 1997; 13: 268–274.
5. Tsakayannis DE, Shamberger RC: Association of Imperforate Anus With Occult Spinal Dysraphism. Journal of Pediatric Surgery 1995; 30: 1010–1012.
6. Golonka NR, Haga LJ, Keating RP et al.: Routine MRI Evaluation of Low Imperforate Anus Reveals Unexpected High Incidence of Tethered Spinal Cord. J Pediatr Surg 2002; 37: 966–969.
7. Ohe N, Futamura A, Kawada R et al.: Secondary tethered cord syndrome in spinal dysraphism. Child's Nerv Syst, 2000; 16: 457–461.