

Subtle imaging findings in a case of tight filum terminale syndrome

Case summary

A newborn female infant was found to have a sacral dimple, and left leg hyporeflexia associated with left clubfoot. A babygram showed no obvious abnormality of the spinal column. The lumbar spine was obscured by prominent bowel shadows, however. Ultrasound of the spine was performed and showed the conus medullaris at the L2/3 level. There was no significant thickening of the filum terminale.

At 2 months of age, a radiograph of the spine was repeated, and a hemivertebra was demonstrated at the L5 level, as bowel shadows were less prominent (Fig 1). Magnetic resonance imaging (MRI) of the spine was performed to investigate spinal dysraphism at the age of 5 months (Fig 2). The conus was at L2/3 level, and there were no other associated findings of cord tethering (thickened filum, filar lipoma or focal myelomalacia). No intraspinal masses such as lipomas were found. A dermal sinus tract was demonstrated as a dark enhancing band within the subcutaneous fat near the S5 level and communicated with the skin dimple. There was no communication with the thecal sac and no associated dermoid or epidermoid cyst. A repeated MRI spine after 1 year yielded static findings, the conus medullaris was at the L2/3 level and showed no ascent over 1 year. In view of patient's neurological symptoms and low-lying conus



FIG 1. Lumbosacral spine radiograph showing the outline of a hemivertebra at 2 months old, it was obscured on the babygram (not shown)



FIG 2. (a) Coronal magnetic resonance imaging (MRI) of the spine showing the L5 hemivertebra. (b) Sagittal MRI showing the conus medullaris ending at the L2/3 level. There is no significant thickening or hyperintensity of the filum terminale. (c) Dermal sinus tract (black arrow) is demonstrated as a dark band within the subcutaneous fat. The tract is seen terminating at the sacral dimple, marked by a fat-containing tablet (white arrow)

medullaris, tethered cord syndrome was diagnosed. Elective L5 left hemilaminectomy and release of the tethered cord were performed. A tight filum terminale was found at operation. The patient had an uneventful operation and recovery.

Discussion

Spinal dysraphism is divided into open and closed types. Open spinal dysraphisms with myelomeningocele and myelocele can be diagnosed clinically, as the neural placode is not covered by skin. Closed dysraphisms, where neural tissues are covered by intact skin, can be further divided into those with and without a subcutaneous mass.¹ Vertebral body deformities such as hemivertebra, and cutaneous lesions such as a dermal sinus, lipoma and haemangioma can be associated.^{2,3}

Our case demonstrated the radiographic findings of a type of closed spinal dysraphism—tight filum terminale syndrome—which caused cord tethering. Cord tethering can cause lower extremity weakness, spasticity, abnormal deep tendon reflexes, clubfoot, sensory disturbance, and bladder dysfunction. The classical imaging findings of tight filum terminale syndrome include thickening of the filum terminale to more than 2 mm in thickness, and a low-lying conus medullaris.⁴

There is variation in defining the normal conus level. Kesler et al⁵ reported that the conus virtually never ends below the mid L2 level; whereas Wilson and Prince⁶ concluded that a conus level at or above

L2/3 should be considered normal at any age.

In our patient, confirmation of the diagnosis was delayed because the hemivertebra was obscured on the initial radiograph, and the MRI did not show the typical findings associated with tethered cord syndrome. Her conus ended at L2/3 level, which would be regarded as normal by some, and there were no significant abnormalities of the filum such as thickening, lipoma, or a cyst. This illustrates that tethered cord syndrome can be present in the absence of the classical imaging findings, and that clinical correlation is more important in making the diagnosis.

Tension on the tethered cord has the potential to cause pain, further cord damage, and progressive neurological deterioration. Untethering surgery offers pain relief and stabilisation of neurological deterioration.⁷ Untethering for our patient was achieved by simple sectioning of the filum via an L5 hemilaminectomy. The patient achieved a good outcome with normal power, tone, and gait.

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