Myelomalacia at the posterior funiculus related to a ventral longitudinal intraspinal fluid collection

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DESCRIPTION

A 48-year-old man visited us with a 6-month history of paraesthesia of the left side of the body which is experienced whenever twisting his body. He had a history of posterior cervical region pain that had lasted 1 week during a skiing trip 15 years earlier. He presented with slight muscle weakness and amyotrophy in the left deltoid and biceps brachii muscles of the arm, showing high amplitude and long duration of motor unit potentials with denervation potentials on electromyography. Serum vitamin B_{12} level was normal. Cerebrospinal fluid (CSF) examination showed increased red blood cell (RBC) count without xanthochromia. MRI showed myelomalacia from the level of the second cervical vertebra (C2) to C4 (figure 1A). Myelomalacia was located in the posterior funiculus at C3 in addition to the anterior horn from C2 to C4 (figure 2). Moreover, ventral longitudinal intraspinal fluid collection (VLISFC) was seen from the level of C2 to the second lumbar vertebra (L2) (figure 1). A dural defect was detected at the intervertebral levels between C7 and the first thoracic vertebra (T1) (figure 3).

Dural defect and VLISFC can present with superficial siderosis of the central nervous system, multisegmental amyotrophy, spinal cord herniation or craniospinal hypovolaemia. The underlying dural pathology has been generically termed 'duropathy'.[1 2] Myelomalacia located at the anterior horn has been reported only in some cases of duropathy.[3] Moreover, this represents the first report to describe myelomalacia extending to the posterior funiculus in duropathy. Myelomalacia at the anterior horn due to duropathy causing amyotrophy may be a consequence of chronic dynamic pressure on the ventral cervical spinal cord by the encapsulated fluid collection or of a conduction block over a tethered motor root segment produced by dorsal cord displacement.[1] Myelomalacia in our patient was clearly depicted as a longitudinal lesion on sagittal MRI (figure 1A), and anterior horn lesions showed consecutive expansion to the lesion of the posterior funiculus on axial MRI (figure 2). We thus suspect that myelomalacia at the posterior funiculus due to duropathy causing sensory disturbance could be explained as a severe form of duropathy with the same mechanism causing anterior horn myelomalacia.

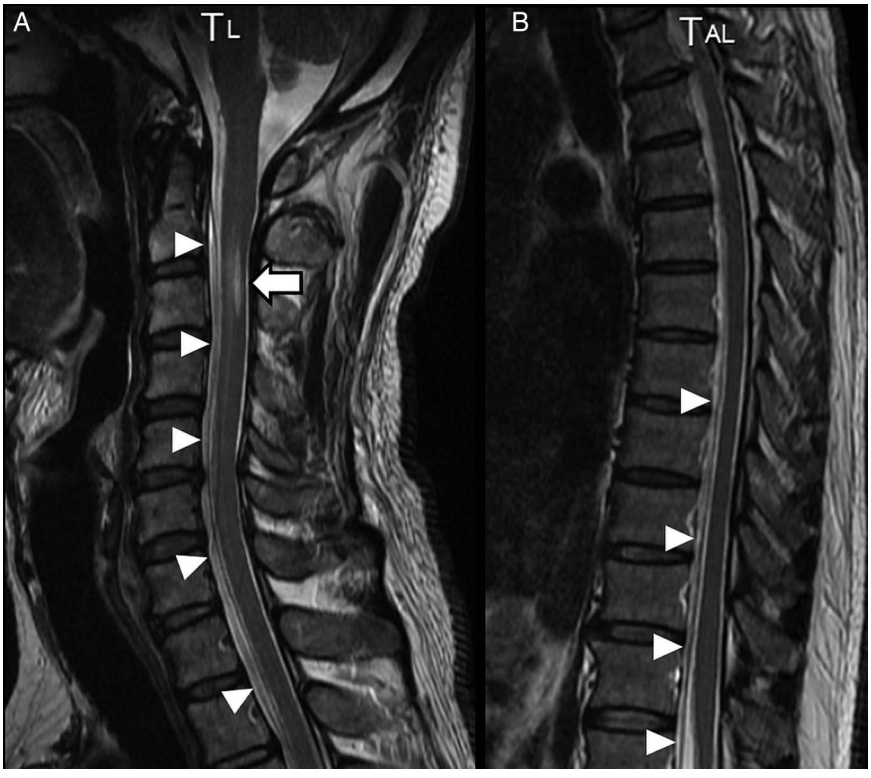

Figure 1 Sagittal T2-weighted imaging of the spinal cord. (A) Myelomalacia is seen at the level of the C2–C4 vertebrae (arrow). Moreover, ventral longitudinal intraspinal fluid collection (VLISFC) is seen from C2 to T2 (arrowheads). (B) VLISFC extends to the L2 vertebral level (arrowheads).

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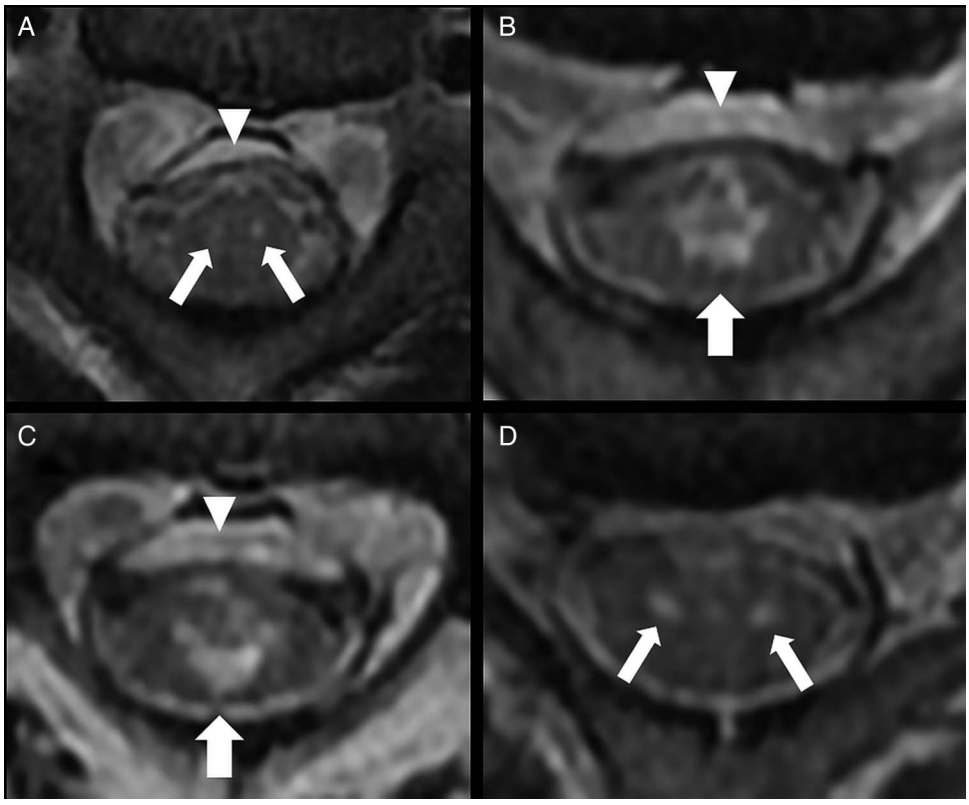

Figure 2 Axial T2-weighted imaging of the spinal cord showing myelomalacia (arrows) and ventral intraspinal fluid collection (arrowheads). (A) Faint hyperintense lesions are seen bilaterally at the anterior horn at the C2 vertebral level. (B) The hyperintense lesion expanding from the anterior horn to the posterior funiculus at the C2/3 intervertebral level. (C) Myelomalacia is clearly located in the posterior funiculus at the C3 vertebral level. (D) Hyperintense lesion is localised to the bilateral anterior horns at the C3/4 intervertebral level, showing a 'snake eyes' sign.

Dural defect has various causes such as trauma, pressure erosion, disc extrusion, osteophyte, congenital disorder (pre-existing meningocele, extradural arachnoid cyst, dural hypoplasia and disorders of connective tissue matrix), duplication of the ventral dura mater and inflammatory process.[4] Occlusion of a dural defect results in improvement of symptoms. Surgical repair with dural repair material rather than targeted epidural blood patches is the preferred intervention. Our patient's dural defect was suspected to be related to a trauma 15 years earlier. As the CSF in our patient showed an increased number of RBCs, there is a risk that the dural defect would cause superficial siderosis with ataxia and impaired hearing.[2] Our patient is thus under consideration for surgical repair of the CSF leak.

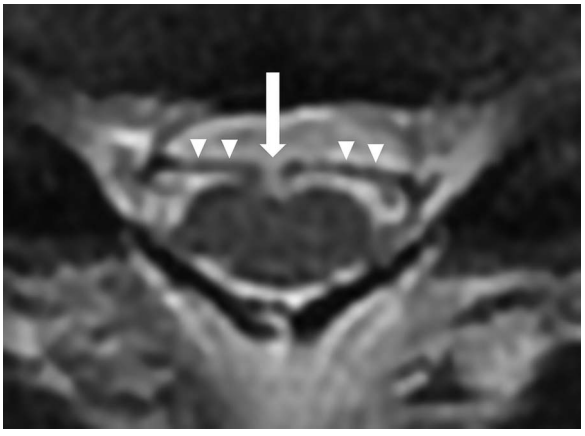

Figure 3 Axial T2-weighted imaging of the spinal cord at the C7/T1 intervertebral level. Dura mater is seen as black lines (arrowheads), and a dural defect (arrow) results in leakage of cerebrospinal fluid from the subarachnoid space to collect in the ventral intraspinal space.

Learning points

- Dural defect and ventral longitudinal intraspinal fluid collection can present with superficial siderosis of the central nervous system, multisegmental amyotrophy, spinal cord herniation or craniospinal hypovolaemia. The underlying dural pathology is advocated to be generically termed 'duropathy'.
- This is the first report to describe myelomalacia also extending to the posterior funiculus in addition to the anterior horn in duropathy.

Contributors The patient was managed by TY, YW, MN. The article was written by YW. TY, MN and EI contributed to critical revision of the article.

Competing interests None declared.

Patient consent Obtained.

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