Posttraumatic spinal cord tethering

Case report

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A 53-year-old woman with a complete C-7 traumatic quadriplegia developed progressive neurological deterioration, including bulbar symptoms, 3 years after her initial injury. Magnetic resonance imaging showed tethering of the spinal cord at the level of her injury, with marked stretching of the cervical cord associated with medullary and tonsillar herniation. Following transection of the spinal cord, there was some improvement in her condition. Possible etiological factors accounting for this unique presentation are discussed.

KEY WORDS • spinal cord injury • traumatic quadriplegia • tethered cord • tonsillar herniation

ATTENTION has recently been drawn to causes of late neurological deterioration in traumatic spinal cord lesions. Frequently, the cause is post-traumatic syringomyelia, but rarer causes such as spinal arachnoiditis and microcystic degeneration have been recorded. The adult tethered spinal cord is also a well-known entity. Thus far, however, only one case of posttraumatic spinal cord tethering resulting in late neurological sequelae has been reported.

The present report illustrates a more advanced form of the disease, associated with bulbar symptoms and tonsillar herniation. The clinical and magnetic resonance (MR) imaging presentation correlated well with the surgical findings.

Case Report

This 56-year-old woman presented to our unit 3 years after being involved in a motor-vehicle accident. At the time of her initial injury, she had been rendered totally quadriplegic with a C-7 functional level. Two years later she underwent a cervical laminectomy, the indication for which is unclear. At the time of admission to our unit, she complained of worsening muscle spasms, deep pain in both arms, and paresthesias in a C5-6 distribution. She described increasing difficulty in swallowing and diminished sensation in her mouth.

Examination. A complete loss of motor and sensory function at the C-7 level was confirmed. Diminished palatal movement and gag reflex were demonstrated. An MR image showed spinal cord tethering at C7-T1, associated with a tautly stretched cervical cord with medullary and tonsillar herniation. Small areas of cord cavitation were also noted at the level of the lesion (Fig 1).

Operation. A laminectomy of C4-T1 was performed. The spinal cord was transected at the level of the lesion and both the rostral and caudal spinal cord segments were mobilized and freed from adhesions; approximately 1 cm of cord was excised in the process. The two ends moved visibly in opposite directions.

FIG. 1. Magnetic resonance image of the cervical spine showing the cord anchored at C-7. The cervical cord is tautly stretched, and there is medullary herniation.
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Postoperative Course. The patient had immediate resolution of her pain and paresthesias. The bulbar symptoms resolved, but the occurrence of muscle spasms was unchanged. Postoperative MR imaging (Fig. 2) illustrated a reduced degree of tonsillar and bulbar herniation. The cervical cord remained thin and possibly atrophic; however, it appeared less taut than before.

Discussion

Progressive myelopathy associated with spinal cord injury is a well-described entity, usually attributed to syringomyelia. A recent case report by Ragnarsson, et al., shed light on a previously unknown entity. They described a 49-year-old man with traumatic paraplegia, who developed progressive neurological loss of function rostral to his previous level, some 20 years after his initial injury. At operation, they too transected a tautly stretched spinal cord with resultant improvement in neurological function. The unique occurrence of bulbar herniation in our patient may bear some relation to her previous surgery or perhaps to the higher level of her lesion.

The progressive myelopathy seen in these two patients can probably be attributed to similar pathophysiological mechanisms of dysraphism and cervical spondylosis associated with a tethered cord. Adams and Logue described myelopathy caused by stretching and mechanical distortion. Cord ischemia and even metabolic changes have been implicated.

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References


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