ADVERSE effects of multilevel cervical laminectomy have been reported, and one of the causative factors is thought to be the development of spinal instability due to partial facetectomy during the laminectomy procedure. In spite of negligible spinal instability or kyphotic deformity after laminectomy, some patients develop recurrent myelopathy, presumably caused by postlaminectomy scar formation. Although numerous articles have been published on this subject, no clear association has been demonstrated between causative factors and radiological changes and neurological evidence.

A dynamic factor may play an important role in postoperative recurrence of cervical myelopathy. A dynamic magnetic resonance (MR) study demonstrated position-dependent spinal cord compression in a patient with postoperative recurrent cervical myelopathy, and helped in the understanding of the pathogenesis of this particular condition.

**Case Report**

**History and First Operation.** This 37-year-old man had complained of numbness and tingling pain in the upper extremities and difficulty walking 5 years earlier. At that time, he had displayed clinical symptoms compatible with cervical myelopathy, which develops primarily after hyperextension injury of the neck. Dynamic cervical radiographs revealed a narrow spinal canal, and a dynamic MR study of the cervical spine also demonstrated diffuse spinal cord compression (Fig. 1 upper left and right). The patient underwent cervical laminectomy from C-3 to C-7 for spinal stenosis.

**Postoperative Course.** After a period of significant improvement in his symptoms, the patient experienced recurrence of cervical myelopathy and presented with numbness and tingling pain in the upper extremities accompanied by difficulty in walking 5 years after his initial surgery. The patient also had noticeable lancinating pain in the upper extremities when his neck was in the extended position.

**Examination.** Plain cervical radiographs indicated limitation of neck motion and slight kyphosis at the C5–6 level (Fig. 1 lower). Sagittal MR images of the cervical spine showed no significant compression in the neutral position (Fig. 2 left and center), whereas the axial images demonstrated disc protrusion, osteophyte formation, and hypertrophied posterior longitudinal ligament (Fig. 2 right). A dynamic MR imaging study was obtained to investigate the dynamic deformity of the cord when the patient’s neck was in the extended position (Fig. 3). The spinal cord showed marked flattening from C4–5 down to the C6–7 level. Axial MR images also demonstrated spinal cord deformity produced by both anterior and posterior components.

**Second Operation and Postoperative Course.** A corpecto-
my of the C-5 and C-6 vertebral bodies along with discectomy at C4–5, C5–6, and C6–7 and osteophytectomy at C5–6 were performed, followed by iliac bone grafting and plate fixation with a cervical spine locking plate (Fig. 4 left). Postoperative MR images revealed a sufficient decompression of the spinal cord (Fig. 4 center and right). The patient’s clinical symptoms resolved after surgery and he returned to his previous work.

Discussion

The causal factors of late deterioration following initial improvement provided by cervical decompressive surgery are still subject to debate. Little attention has been paid to the use of postoperative dynamic MR imaging studies to find spinal cord compression and eliminate the cerebrospinal fluid space in a variety of neck positions postsurgery.

Numerous studies have been conducted on the mechanism of the development of cervical spondylotic myelopathy caused by the dynamic effects of neck movement.1,2,5,6 However, few reports have pointed out the importance of
the postoperative neck motion effect on spinal cord compression. In this respect, our report is the first to use a dynamic MR imaging study to reveal an exact cause of delayed recurrent cervical myelopathy after an initial postoperative improvement. Epstein, et al., 4 recently stressed the importance of persistent ventral spinal cord compression, especially by osteophyte formation, following laminectomy as the cause of deterioration and myelopathy. Osteophyte formation could also be seen in our case. The surgical strategy used to treat recurrent cervical myelopathy should be planned after a thorough review of the radiological studies. In this case, treatment consisting of anterior decompression and fusion with plate fixation was selected because the main compression site ventral to the spinal cord and a slight kyphosis were recognized at the C5–6 level and could be better remodeled by using an anterior rather than a posterior procedure.

Conclusions

A dynamic MR imaging study provides a useful measure in the investigation of position-dependent spinal cord compression after cervical laminectomy.

References


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