Recurrence of cervical myelopathy secondary to a strut graft fracture 20 years after anterior decompression and fusion: a case report

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ABSTRACT

This study reports on a 70-year-old man with recurrent cervical myelopathy 20 years after anterior decompression and fusion of C4–7 using a free vascularised strut graft. The recurrent myelopathy was secondary to a kyphotic deformity of a fractured graft and residual ossification of the posterior longitudinal ligament with stenosis at C3/4. Intraoperative spinal cord-evoked potentials indicated that spinal cord traction secondary to progressive kyphosis of the cervical spine after the graft fracture was the cause. The patient underwent laminoplasty at C3 and laminectomy at C4 to decompress the stenosis at C3/4 as well as posterior cervical spinal fusion at C3–7 with pedicle screws and a lateral mass screw and a bone graft to prevent further progression of the kyphosis. At postoperative 18 months, the patient’s Japanese Orthopaedic Association score had improved to 14 from 8, and he could walk without support.

INTRODUCTION

Treatments for cervical ossification of the posterior longitudinal ligament (OPLL) include anterior decompression with fusion, laminectomy with or without fusion, and laminoplasty. This study reports on a 70-year-old man with recurrent cervical myelopathy 20 years after anterior decompression and fusion of C4–7 using a free vascularised strut graft.

CASE REPORT

In May 2012, a 70-year-old man presented with a 4-month history of neck pain (without any injury) and numbness in the fingers and a 2-month history of muscle weakness in all 4 limbs. 20 years earlier, the patient had undergone anterior decompression...
and fusion with a free vascularised iliac crest graft for cervical myelopathy of C4 to C7. 16 years earlier, the patient had been diagnosed with idiopathic thrombocytopenia, and he had been taking prednisolone 7.5 mg/day to control the disease. Two years earlier, complete fusion of the graft was reconfirmed on radiographs (Fig. 1). Four months prior to the recurrence of myelopathy, the patient’s Japanese Orthopaedic Association (JOA) score was 16. On examination, the patient’s JOA score had deteriorated to 8. Radiology showed a kyphotic deformity at the graft fracture site and callus formation (Fig. 2). The graft fracture was probably induced by long-term administration of steroids. The kyphotic deformity progressed gradually after the fracture, leading to the exacerbation of myelopathy. At C3/4, residual OPLL and stenosis was noted. The anteroposterior diameter and cross-sectional area of the cord at the C3/4 level were 4.7 mm and 47.9 mm², respectively, which were similar to measurements taken 4 years earlier (4.3 mm and 47.5 mm², respectively, Fig. 3). The segmental motion measured on lateral flexion and extension radiographs decreased from 12.3° to 6.9° during these 4 years.

Intra-operative spinal cord-evoked potentials showed a decrease in the negative wave and an increase in the positive wave at the C3/4 level for both ascending (lumbar epidural stimulation) and descending (transcranial stimulation) spinal cord-evoked potentials. A conduction block was noted at this site (Fig. 4). Spinal cord traction secondary to progressive kyphosis of the cervical spine after the graft fracture was determined as the cause. The patient underwent laminoplasty at C3 and laminectomy at C4 to decompress the stenosis at C3/4 as well as posterior cervical spinal fusion at C3–7 with pedicle screws and a lateral mass screw and a bone graft from the posterior ilium to prevent further progression of the kyphosis (Fig. 5).

At postoperative 18 months, the patient’s JOA score had improved to 14, and he could walk without support.

**DISCUSSION**

Anterior decompression with fusion is appropriate for patients with marked kyphotic deformity and
stenosis with a large OPLL (occupying >50% of the canal anteroposterior diameter).\textsuperscript{2} The tricortical bone taken from the iliac crest is usually used as the strut graft for fusion of up to 3 segments. Our patient was a cigarette smoker, and thus a free vascularised iliac crest graft was used to minimise the risk of non-union. In addition, microvascular anastomosis of the deep circumflex iliac artery and vein with the superior thyroid artery and vein was performed.

Complications of anterior fusion with a strut graft include dislodgment of the graft or plate, graft collapse, subsidence, pseudoarthrosis, kyphotic deformity, and graft fracture.\textsuperscript{3,4} In our patient, complete fusion at C4–7 was reconfirmed 2 years before recurrence of cervical myelopathy. The fragility fracture was thought to be caused by excessive stress on the strut graft owing to agricultural work and long-term steroid use.\textsuperscript{5,6} Whether steroid-induced osteoporosis affects vascularised more than non-vascularised grafts is unclear. The myelopathy was thought to be caused by the kyphotic deformity of the fractured graft and residual OPLL with stenosis at C3/4. However, intra-operative electrophysiological diagnosis using spinal cord-evoked potentials indicated clear signs of a conduction block at the C3/4 level.\textsuperscript{7,8} The stenosis at C3/4 did not progress and was similar to that measured 4 years earlier. Thus, the myelopathy was determined to be caused by spinal cord traction at the caudal site of C3/4 secondary to the kyphotic deformity at the graft fracture site. In cases of tethered cord syndrome, the traction on the caudal cord results in decreased blood flow causing metabolic derangements that culminate in motor, sensory, and urinary neurological deficits.\textsuperscript{9}

**DISCLOSURE**

No conflicts of interest were declared by the authors.
REFERENCES