Low back pain and cervical spondylotic myelopathy

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ABSTRACT

**Purpose.** To determine characteristics responsible for improvement of low back pain after cervical laminoplasty for cervical spondylotic myelopathy.

**Methods.** 18 men and 10 women aged 38 to 88 (mean, 71) years who had a low back pain visual analogue scale (VAS) score of 5 or more before cervical laminoplasty were included. In 12 patients the VAS score improved to ≤1 after surgery and remained so at 2 years, but in 16 it remained unimproved. Patient characteristics of the 2 groups were compared.

**Results.** Preoperatively, 11 of the 12 patients with improved VAS score had continuous low back pain all day, compared to 3 of the 16 who remained unimproved (p<0.01).

**Conclusion.** In some patients, low back pain may be improved following cervical laminoplasty.

**Key words:** low back pain; spinal cord diseases

INTRODUCTION

Many patients with cervical spondylotic myelopathy have a false localising sign of low back pain; in some the pain improves after cervical laminoplasty.1–4 We conducted a prospective study to determine characteristics responsible for improvement of low back pain after cervical laminoplasty.

MATERIALS AND METHODS

Between April 2003 and March 2005, 126 consecutive patients underwent spinous process-splitting laminoplasty (C3-6, C3-7) for cervical spondylotic myelopathy in our hospital. Of them, 18 men and 10 women aged 38 to 88 (mean, 71) years whose preoperative low back pain visual analogue scale (VAS) score was ≥5 (mean, 6.5; standard deviation [SD], 1) were included. Their primary diagnoses were cervical spondylotic myelopathy (n=17) and ossification of the posterior longitudinal ligament of the cervical spine (n=11). Postoperatively, they
started walking on day 2, and analgesics were given orally up to day 7. The mean follow-up period was 3.4 (range, 2.3–4.3) years.

The characteristics and duration of the preoperative low back pain (whether continuous throughout the day or sporadic or worse at rest) were recorded. The severity of cervical spondylotic myelopathy was assessed using the Japanese Orthopaedic Association (JOA) score. It measures upper extremity function, lower extremity function, sensory disturbance, and bladder function; the maximum score is 17. The improvement rate of the JOA score at 2 years was calculated using the Hirabayashi formula: recovery rate = (postoperative JOA score - preoperative JOA score) / (17 - preoperative JOA score) x 100.

Degenerative change (disc height loss, osteophyte formation, and diffuse sclerosis) of the lumbar spine on radiographs were classified according to Wilke et al. Those who scored ≥4 out of 9 were considered positive. Intramedullary signal changes of the cervical spine on T1- and T2-weighted magnetic resonance imaging (MRI) were categorised into (1) no changes, (2) changes only on T2-weighted images, and (3) changes on both T1- and T2-weighted images. Each radiological assessment was made by 2 orthopaedic specialists.

The VAS scores of low back pain at postoperative week 2 and year 2 were recorded. Patients with a score of ≤1 at 2 weeks were defined as improved. The improved and unimproved groups were compared using Student’s t test and Fisher’s exact test. A p value of <0.05 was considered statistically significant.

RESULTS

Preoperative low back pain was continuous throughout the day in 14 patients. It was worse at rest in 11 patients. The pain characteristics were described as: taut (n=7), stabbing (n=6), heavily dull (n=5), burning (n=4), crick-like (n=3), and having a girdle distribution (n=3). The mean duration was 19 months (range, 1 month to 20 years).

The mean pre-and post-operative JOA scores were 9 (range, 5–15) and 14 (range, 8–17), respectively. The mean improvement rate was 60% (range, 13–100%).

Preoperatively, 7 patients had degenerative changes of the lumbar spine on radiographs. 18 patients had no intramedullary signal changes of the cervical spine; 9 showed changes on T2-weighted images; and one on both T1- and T2-weighted images.

The mean VAS scores at postoperative week 2 and year 2 were 4 (SD, 3) and 3 (SD, 3), respectively. In 12 of the 28 patients the score improved to ≤1 after surgery and remained so at 2 years (Table 1). Preoperatively, 11 of these 12 patients had had continuous low back pain throughout the day, compared to only 3 of the 16 who remained unimproved (p<0.01, Table 2). There were no significant differences between the 2 groups in terms of age, gender, primary diagnosis, pain worse with activity, characteristics and duration of pain, pre- and post-operative JOA scores and its improvement rate, degenerative change of lumbar spine, and intramedullary signal changes of the cervical spine (Table 2).

DISCUSSION

Patients with cervical spondylotic myelopathy sometimes have a localised girdle sensation in the
mid-trunk known as the false localising sign.\(^1\)\(^4\) Unlike sporadic pain noted in patients with cervical angina,\(^6\) this false localising sign is often continuous and may be misdiagnosed as hysteria or a visceral disorder.\(^1\)\(^4\)

Five (13\%) of 38 patients with cervical spondylotic myelopathy had a false localising sign between T4 and T11, mostly described as a burning or shooting feeling that improved 3 days after surgery.\(^3\)

The postulated mechanisms for the development of this false localising sign include: disorder of the spinothalamic tract,\(^4\) venous obstruction and ischaemia of the thoracic cord,\(^7\) and obstruction of the anterior spinal artery,\(^3\) though none of these has been conclusively established. This false localising sign is considered a long tract (not a segmental) sign because (1) it is accompanied by a reduced vibration sense, indicating it may be caused by a disorder of the posterior columns of the spinal cord; (2) the associated pain can arise at a level much lower than the level hampered by stimulating the ascending spinothalamic tract, which may also be disturbed; and (3) ischaemia can occur in the middle-lower thoracic spinal cord by the compression of the anterior spinal artery of the lower cervical spinal cord, resulting in false localising symptoms at the middle-lower thoracic spinal cord level, possibly related to disturbed blood flow in the anterior spinal artery.

In our study, 12 of the 28 patients had their VAS scores improved to ≤1 after cervical laminoplasty and remained so at 2 years. This may be attributable to rest and analgesia, and alleviation of physical and mental stress after the operation. Nonetheless, as VAS scores for low back pain in 16 patients did not improve after surgery, and the cause of their pain remains unknown.

### REFERENCES

3. Ochiai H, Yamakawa Y, Minato S, Nakahara K, Nakano S, Wakisaka S. Clinical features of the localized girdle sensation of mid-trunk known as the false localising sign.\(^1\)\(^4\)