



POSTERIOR CERVICAL DECOMPRESSION AND FUSION FOR CIRCUMFERENTIAL SPONDYLOTIC SPINAL CORD COMPRESSION: PROSPECTIVE REVIEW OF 37 CONSECUTIVE CASES

A/Prof. Lali Sekhon, Department of Neurosurgery, Royal North Shore Hospital and the University of Sydney, Sydney, AUSTRALIA



PURPOSE OF STUDY

The management of spondylotic cervical myelopathy typically involved anterior decompressive surgery at one or more levels. For circumferential disease this can be followed by interval posterior laminectomy, if required, or alternatively via multilevel posterior cervical laminectomy. Multilevel anterior decompression and fusion is not a low morbidity procedure.^{1,5,6,8} With recent improvements in posterior instrumentation,^{2,4} a resurgence of interest in posterior instrumentation and decompression has occurred. This study presents a clinical and radiological prospective evaluation of 37 patients with symptomatic spondylotic cervical myelopathy who were managed with wide posterior laminectomy and lateral mass instrumented fusion.

METHODS

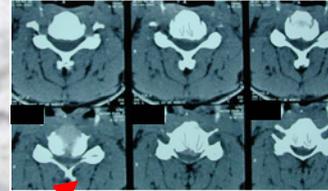
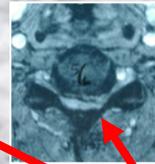
37 consecutive patients (23 male, 14 female) over a 2½ year period presenting with symptomatic cervical myelopathy due to circumferential spondylotic spinal stenosis were evaluated and operated upon by a single surgeon and followed in a prospective fashion. All patients underwent preoperative clinical, radiological and MR evaluation. All patients had preoperative imaging that documented both ventral and dorsal cervical cord compression. All 37 patients underwent a posterior cervical laminectomy and lateral mass fusion with local autograft. Between 1 and 4 levels were instrumented (mean ± s.d. = 2.5 ± 0.7). In 22 patients the Axis® plate/screw system was used and in the last 15 patients a polyaxial screw/rod system was used. Six patients had diabetes and five patients were smokers. Preop Nurick Grade was 1.75±1.6 (mean ± s.d.) Postoperatively patients were evaluated clinically and radiologically at 6 weeks, 3 months, 6 months, 12 months and at 2 years, if possible (mean follow-up 12.14±7.9 months). MRI scanning was repeated 3 months postoperatively and reviewed in a blinded fashion for the adequacy of decompression and the presence of residual compression.

SUMMARY OF FINDINGS

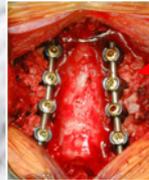
No deaths occurred and no instrumentation-related neural or vascular injuries were noted. Three patients had >500 ml blood loss during the procedure (1 transfused). There were three dural tears repaired intraoperatively and 1 superficial infection treated with antibiotics. Postoperative neck pain typically resolved within 3-4 weeks. Three patients had single level screw pullouts which did not affect clinical outcome, and required no intervention. One patient required extension of the laminectomy by one level 6 months after initial surgery. Of note were postoperative MR findings. No patient required reoperation for ventral compression and in all cases CSF was visible anterior to the cord on postoperative MR scanning, with relief of anterior compression. No myelopathic deterioration was noted postoperatively, although one patient suffered a C5 root lesion. Most patients improved by at least 1 Nurick grade. On serial imaging, postoperative kyphosis occurred in 3 cases. A good range of movement was present in all patients, with no subjective limitations. All patients reported adequate neck mobility for daily living. Oswestry Neck Disability Scores⁷ improved from 48.346.8 to 38.2412.1 (P<0.05). No case of symptomatic adjacent segment disease requiring intervention has been noted at last follow-up. There was no difference between the results in patients who were instrumented with a screw/plate construct as opposed to a screw/rod construct.

ILLUSTRATIVE CASE

PREOP

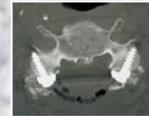


INTRAOP



Note that preoperative circumferential stenosis is relieved by wide laminectomy and fusion with lateral mass plates and screws

POSTOP



RESULTS SUMMARY

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n=37 (mean ± s.d.)	
Male	23
Female	14
Total Levels Fused	106
Average Levels Fused	2.8±0.70
Total Number of Screws Placed	212
Preop Nurick Grade	1.75±1.6
Postop Nurick Grade	1.0±0.6
Preop Circumferential Cord Compression	100%
Postop Circumferential Cord Compression	0%
Worsening of Preoperative Deformity with Screw Pullout	8%
Reoperation?	2.70%
Adjacent Segments Requiring Surgery	0%
Range of Follow-up (months)	3-30
Average Follow-up (months)	12.14±7.9
Preop Oswestry Neck Disability Score	48.346.8
Postop Oswestry Neck Disability Score	38.2412.1

CONCLUSIONS

Lateral mass plating is a safe and effective stabilization technique. An improvement in myelopathy with low morbidity can be achieved. The incidence of adjacent segment disease is lower than for anterior interbody fusions⁹ with a 0% incidence at follow-up to date. Acceptable outcomes in terms of neck pain and mobility can be achieved and prevention of postoperative kyphosis is achieved. This study demonstrates that multilevel circumferential cervical cord compression can be managed by single stage decompression and fusion via a posterior approach with very low morbidity and excellent clinical and radiological outcome. Non-constrained plate/screw systems can be used as a cheap yet satisfactory option for subaxial disease with polyaxial screws reserved for junctional pathologies. The incidence of adjacent segment disease may also be lower than that seen with traditional anterior interbody fusion techniques.

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