The Importance of Removing Osteophytes as Part of the Surgical Treatment of Myeloradiculopathy in Cervical Spondylosis

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The controversy regarding the management of cervical spondylotic myeloradiculopathy persists, with proponents vigorously supporting an increasing number of surgical procedures.2,4,8,10,13,17,22,56 The ideal operation should relieve the spinal cord and nerve roots from pressures in all quadrants, including those exerted ventrally by osteophytes,2,13,25 and dorsally by infolded yellow ligaments,36 lamina,5,10 or osteophytes on the posterior facets.18

The anterior operative approach stresses a direct attack on the ventral osteophytes by traversing the vertebral body; however this approach does not allow treatment of problems related to the size of the spinal canal and the posterior elements2,25,30,34 in cases where laminectomy and foraminotomy are necessary.10,56 Recently, extensive unroofing of the entire cervical canal has been recommended in an effort to disengage the cord from the ventrally situated osteophytes1,2,5,31 but this procedure does not solve the problem of nerve root entrapment caused by foraminal osteophytes.

Circumferential decompression of the spinal cord and nerve roots can be achieved if the procedure of laminectomy and foraminotomy is augmented by the removal of ridges and spurs from the floor and foramina of the spinal canal; this can be accomplished with the use of sharp, downbiting straight and angulated curettes and rasps. The procedure thus makes extensive laminectomy unnecessary.2,13,24

Early results in the treatment of cervical spondylotic myeloradiculopathy have indicated that laminectomy with or without foraminotomy plus section of the denteate ligaments was still inadequate as long as the osteophytes were permitted to remain in the floor of the spinal canal.11,12,17

Method

This analysis reviews the results obtained in two reasonably comparable groups of patients with myeloradiculopathy; in one the osteophytes were removed and in the other they were not.11,12 Patients with simple radiculopathy caused by foraminal osteophytes have been excluded from this study and have been reported elsewhere.14 In our series of 57 patients, 20 were treated by laminectomy and foraminotomy alone,11,12 and 37 also had the osteophytes excised.

Surgical Technique

The laminectomy extended over three to four levels in 70% of all 57 patients, two levels in 20%, and five levels in 10%. Hemilaminectomy of the superior and inferior remaining lamina with liberal undercutting of the adjoining margins completed the laminar decompression. Foraminal decompression was performed at each involved level.

Osteophytes were removed after excision of the medial portions of the facets overlying the foramina (Fig. 1). After perineural adhesions were stripped and the nerve root freed from underlying spurs, the untethered thecal sac was sufficiently mobilized to permit the insertion of sharp, downbiting curettes into the ventral quadrants of the spinal canal.13,14 A straight curette was used to remove the lateral osteophytes and various sized angulated curettes were used to excise the more medially situated ridges. The curettes are
available commercially or can be fashioned from new No. 00 to 2 sharp curettes by simply bending them at 5 to 8 mm or more from the tip at angles of from 20° to 45°. A small rasp can also be used effectively for this purpose. The major portion of the facet is preserved by removing, at the most, only the medial one-third and by undercutting the margins.

The dura was observed to expand and resume normal pulsations when laminar and foraminal decompression was adequate.

The indicated operation must be performed with the patient in the seated position with hips and knees flexed, maintaining the neck neutral or slightly extended to prevent tight approximation of the cord against the ventral spurs. The blood pressure and the electrocardiogram are monitored, with legs wrapped in elastic bandages. A catheter placed in the right cephalic vein is threaded into the right atrium in order to evacuate an air embolus, should this occur. Elevation of the arms relaxes the nerve roots and places them at a right angle or upward angle to the dura, facilitating insertion of the curettes (Fig. 1). Dorsal displacement of the cord occurs when sufficient lamina have been removed. The dorsal-ventral diameter of the spinal canal and the findings on myelography determine the extent of the laminectomy.

In patients with excessive cervical lordosis and shingling of the lamina, the ventral osteophytes are usually small. More important is the narrowing of the spinal canal by the dorsal intrusions of displaced lamina, thickened yellow ligaments or infolded dura. Liberal dorsal decompression over four or more segments may be mandatory to permit the dural sac and its contents to rise posteriorly away from the floor into a newly fashioned, shorter canal.

In older individuals, stainless steel wire closure of the cervicodorsal fascia and skin is recommended. Early ambulation is encouraged, and cervical supports are seldom necessary. Most patients are discharged after 7 to 10 days. While this procedure is more painful than the anterior surgical approach, the discomfort rarely lasts longer than 2 weeks.

**Results**

Table 1 indicates that the clinical characteristics and surgical results in patients treated by simple laminectomy and foraminotomy were distinctly inferior to those obtained in patients in whom osteophytes were also removed. The excellent-to-good results increased from 50% to 80%, and the total number of patients showing improvement rose from 50% to 90%.

The 37 patients operated on by the present technique have been followed for 1 to 8 years, the average being 3½ yrs. One died of a malignant lymphoma, and three were lost.