Intramedullary Tumors of Spinal Cord
A Follow-Up Study after Total Surgical Removal*

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In 1954, a paper was given before the Harvey Cushing Society on the total removal of intramedullary tumors. A technique was described and a three-dimension motion picture was presented, showing details of surgery and a follow-up on a patient who was walking quite well 2 weeks after her operation. Six cases were presented in the original study. Follow-up on this group is included here, together with the results on 4 additional patients operated upon for intramedullary tumors of the spinal cord. Reports of total removal have been few and the results were partial recoveries. Without removal, paralysis and reduction of life expectancy are inevitable.

In the 10 cases in which total removal was feasible 9 tumors were ependymomas and 1 was a teratoma (Fig. 1). In no case has there been evidence of recurrence, although after 3 to 7 years there has been slight regression in 3 cases, suspected as being caused by gliosis, since follow-up myelograms have been negative (Fig. 2). Roentgen-ray therapy has not been used. Doubtless, ependymomas of the cord will be encountered that are more cellular, invade the cord, and cannot be removed totally, but none has been encountered in the last 15 years. The astrocytomatas, other gliomas, and lipomas are not suitable for this type of surgical attack.

The technique is not remarkable, but does depend on the use of the two-point coagulation forceps—a miniature model of which is now used for work on the cord. Emphasis is placed on gentleness, an "elastic" feel of the tissues and the maintenance of a dry field throughout. Vessels leading into the tumor from its point of origin in or near the central canal must be coagulated under saline irrigation and cut with plastic surgical scissors. Strong magnifying glasses worn by the operator help in seeing the detail of his careful dissection along the planes of cleavage. Dissection should never be continued unless one is sure of the line between cord and tumor. Additional instruments needed are shown in Fig. 3.

Results of Surgery

Except for 3 of 10 patients, all were made worse temporarily by operation at least for a few days—3 for over a year: 2 of these now walk quite well, while the third retains a spastic gait and is the only patient made seriously worse by operation. A myelogram 1 year after operation was negative. As can be seen from Table 1, 6 or 50 per cent are rated above 85 per cent, walking quite well with little or no spasticity 2 to 21 years after operation (Fig. 4). Two are unable to walk without a cane or crutches. One of these was almost totally paralyzed at the time of operation and is improved, but the other still was able to walk with moderate spasticity and really needs a cane. Two patients have died, 1 from pneumonia 6 days after operation (1942) and the other 4 months after operation; both had had previous laminectomies elsewhere. Only 1 of 2 other patients who had laminectomies before coming to us can be classified as having an excellent result.

Summary

1. A follow-up study on 10 intramedullary tumors of the spinal cord, including 9 ependymomas and 1 teratoma, reveals that all 8
living patients are able to walk (6 of them almost perfectly). The remaining 2 are ambulatory, 1 with Canadian crutches and 1 needs at least a cane.

2. Tumors of this type, as indicated in 1954, are potentially enucleable with careful technique.

3. With no evidence of recurrence in 2 to 21 years, it is felt that many of these lesions must be curable.

Fig. 1. Cases 5, 8 and 9 at operation; now 8, 5, and 3 years postoperative.

Fig. 2. Case 4, preoperative and 8-year postoperative myelograms.