CASE REPORTS AND TECHNICAL NOTES

INTRADURAL LIPOMA OF THE SPINAL CORD
REPORT OF A CASE

Tokuso Taniguchi, M.D., and Joseph A. Mufson, M.D.
St. Joseph's Hospital, and Marquette University School of Medicine, Milwaukee, Wisconsin

(Received for publication February 17, 1950)

In an excellent review of the literature, Ehni and Love in 1945 collected 26 cases of intradural lipoma of the spinal cord and added 4 of their own. Since then 2 additional cases have been reported. Intradural lipomas, unassociated with spina bifida, are very rare, constituting about 1 per cent of all tumors of the spinal cord.

In view of its infrequent occurrence, the following case of intradural lipoma of the spinal cord is being presented. The tumor was presumably intramedullary in location.

CASE REPORT

M. S., a 58-year-old white male, was admitted on July 25, 1949 with the chief complaint of progressive weakness in both lower extremities of 5 years' duration. For about 4 years prior to the onset of this difficulty, he had noted periodic twitchings of the muscles in the legs and spasmodic flexion at the hip and knee joints. Gradually, these flexion movements became forceful, especially on the left, causing involuntary flexor spasms of the lower limbs. He also noted progressive loss of sensation in the thighs. On July 15, 1949, he became totally unable to walk and subsequently lost sphincter control of the urinary bladder and bowel. He was thought to have syringomyelia by several physicians who had examined him since the onset of his symptoms.

Examination. He was a well developed, well nourished, middle-aged male who appeared in no acute distress. B.P. 208/140. The chest was clear and the heart sounds were regular. There was marked weakness of both lower limbs with atrophy of the quadriceps muscles. Fibrillations were noted in the atrophic muscles. Knee and ankle reflexes were hyperactive, and a Babinski sign was present bilaterally. There were hypesthesia and hypalgesia over the anterior and lateral aspects of the thighs corresponding to the 2nd and 3rd lumbar dermatomes. Vibratory sensation was absent in both lower limbs. Position sense was impaired in the toes. The abdominal reflexes were present in all quadrants. There were no neurological disturbances in the upper limbs, and the cranial nerve functions were intact.

Lumbar puncture on July 27, 1949 revealed a partial subarachnoid block. The CSF was crystal clear. There was a slight increase in the total protein (53.2 mg./100 cc.) with a normal amount of globulin. Wassermann and colloidal gold tests were negative.
Plain roentgenograms of the dorsal and lumbar spine were negative, except for moderate hypertrophic changes in the lower lumbar vertebrae. On July 28, 1949 pantopaque myelography disclosed an obstruction to the column of oil at the level of the 11th dorsal intervertebral space, suggesting the presence of an intraspinal mass.

Two days after myelography, an acute coronary thrombosis developed, and it was necessary to postpone surgery for several weeks.

**Operation.** On Sept. 29, 1949 a laminectomy of the 10th, 11th, and 12th thoracic vertebrae was carried out. Upon opening the dura, a fusiform swelling of the spinal cord was found at the level of the 11th thoracic vertebra (Fig. 1). This swelling was produced by a well circumscribed, lobulated, intramedullary tumor, measuring approximately $3 \times 2$ cm., which had a distinct yellow color. The cord in this area was almost entirely replaced by the tumor, with only a small amount of neural tissue present anteriorly and laterally. The pia-arachnoid covered the posterior surface of the tumor. While the tumor appeared to be well circumscribed it was intimately associated with the surrounding neural tissue and emerging nerve roots so that no distinct line of separation could be made out. A small portion of the tumor was removed through a midline dorsal incision, but the major portion was left behind, since it was felt that the tumor could not be completely removed without sacrificing the cord at that level. The wound was closed, but the dura was left open for added decompression.

**Histological Study.** The tumor was composed of well differentiated adipose tissue. Nerve bundles could be seen traversing the fat tissue (Fig. 2).

The postoperative course was uneventful and he was discharged from the hospital on Oct. 15, 1949 without any change in the neurological status.

**DISCUSSION**

Intradural lipomas form a very interesting group of spinal cord tumors. They have a tendency to occur at three distinct age periods—during infancy, at puberty and during the 3rd to 5th decades. The lipomas occurring during infancy are often
associated with multiple congenital deformities and may extend along the entire length of the cord. The distribution of the lipomas between sexes is about equal. They tend to arise predominantly in the lower cervical and upper thoracic regions and characteristically appear on the dorsal aspect of the cord with a predilection for the midline.

A review of the literature reveals only a few cases reported as intramedullary lipoma of the spinal cord. The true intramedullary nature of these lipomas has been questioned.\(^1\) There is some basis for this skepticism, for although occasional fat cells have been described as being found within the leptomeninges by Chiari, Kol-lakes, Bostroem, and others, fat has never been found lying free within the neural tissue. In our case, although the tumor was intramedullary in location, no definitive statement can be made as to its site of origin due to the lack of histological sections showing the exact relationship between the tumor and the surrounding leptomeninges and neural elements.

In general, the intradural lipomas are composed of well-differentiated adipose tissue, similar to that found elsewhere in the body. Excess fibrous tissue may be present in some of the lipomas (fibrolipomas). A myolipoma containing many striated muscle fibers has been reported by Gowers.\(^2\)

In regard to the histogenesis of lipomas of the spinal cord, several theories have been advanced: (1) metaplasia of adipose tissue from the connective tissue of the pia-arachnoid membrane; (2) developmental error in which lipomas arise from inclusions of embryonic rests within the meninges during the formation of the neural tube; and (3) proliferation of fat cells which are found occasionally in the pia. None of these theories seems to explain satisfactorily all the features of intradural lipomas. However, the weight of evidence seems to point to a developmental error, in view of the frequency with which lipomas are associated with spina bifida and other congenital anomalies. To account for the myolipoma and fibrolipomas, the possibility of these tumors being hamartomas must be considered.

In contrast to lipomas found in other parts of the body, those present intradurally in close relationship to the spinal cord are often removed with great difficulty or are only partially removable because of their intimate association with the neural tissue and nerve roots. In these cases, the symptoms are usually of long duration and may extend over a period of 10 years or more.

**CONCLUSION**

A case of intradural lipoma of the spinal cord having intramedullary features is presented. Up to this date, 32 previous cases of intradural lipomas have been described in the literature. “Intramedullary” lipomas are unusually rare, and their true site of origin is still a matter of dispute.

**REFERENCES**