Neural fibrolipoma is a rare tumor of the peripheral nerves. In 1953, Mason reported on a patient with a “neuroma of the median nerve” and another with “a fusiform mass involving the median nerve.” In 1964, the lesion was histologically identified as an “intraneural lipoma” because the fibers of the median nerve were spread out over the surface of a fatty tumor containing very scant fibrous supporting stroma. Since that time, various alternative names have been reported, including neural fibrolipoma, fibrolipomatosis of nerve, fibrolipomatous hamartoma of nerve, lipofibroma of nerve, and neurolipomatosis. The WHO classification published in 2002 designated this benign tumor as “lipomatosis of nerve.” A striking predilection exists for the upper extremities. Approximately 80% of upper-extremity lesions originate in the median nerve. A neural fibrolipoma originating from a thoracic nerve and extending from the epidural space into the thoracic cavity is exceedingly rare. A patient with an epidural thoracic neural fibrolipoma is reported.

Epidural neural fibrolipoma of the thoracic vertebral canal

Case report

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Neural fibrolipoma is a benign tumor that most frequently infiltrates the median nerve. The authors describe a patient with spinal cord compression syndrome caused by a neural fibrolipoma. The tumor originated in the thoracic nerve at the T6–7 extradural level in the left conjugate foramen and extended into the thoracic cavity. Total removal was achieved by a combined posterior and costotransversectomy approach. Postoperatively, the patient’s spinal cord compression syndrome resolved. No tumor recurrence has been observed in medium-term follow-up. This is the second case of an extradural spinal neural fibrolipoma to be reported in the literature.

Key Words • epidural • fibrolipoma • paraparesis • thoracic • oncology

Examination. This 49-year-old woman presented with progressive lower-limb weakness, numbness to pinprick and impaired light touch sensation below the T-6 level (Nurick Grade 2), and urgent micturition of 3 months’ duration. The patient also reported slight pain and reduced sensation in the left T-6 radicular area. Contrast-enhanced MRI showed an expanding lesion at the T6–7 level of the spinal canal that was approximately 4 cm in diameter and severely compressed the spinal cord (Fig. 1). The lesion slightly enlarged the left conjugate foramen and extended into the chest cavity. The lesion was thought to be a dumbbell schwannoma. The bone marrow of the adjacent vertebral body showed an area of high signal intensity on T2-weighted images.

This article contains some figures that are displayed in color online but in black-and-white in the print edition.
Operation and Postoperative Course. We approached the lesion through a left curvilinear skin incision; the middle of the incision was 6 cm from the midline and the ends extended to T-2 and T-10, respectively. The subcutaneous and muscle tissues were dissected and rotated en bloc using a sharp periosteal elevator to uncover the ribs, the costotransverse joints, the transverse processes, the left laminae, and the spinous processes up to the right laminae of T-6 and T-7. After T6–7 laminectomy, the extradural spinal portion of the lesion was visualized. Removal of the left T-6 transverse process allowed exposure of the articular portion of the sixth rib tubercle. The neurovascular bundle running immediately under the left sixth rib was identified. The periosteum from the internal surface of the rib, overlying the pleura, was undercut. The rib was dissected in its lateral exposure using a Gigli saw and was easily detached from the costovertebral joint. The final surgical field exposed the extradural, intrathoracic lesion and the parietal pleura. Surgical removal was accomplished with resection of the T-6 nerve from which the lesion originated in the left conjugate foramen, and in which it was completely embedded. The entirety of the tumor was extradural and extended into the thoracic cavity for approximately 3 cm, adhering slightly to the external pleura and aorta. The tumor was removed piecemeal. The dura mater and vertebral bone were normal in appearance, and there were no signs of infiltration. To avoid adherence, a dural patch was sutured in place to separate the paravertebral muscles from the pleura. The postoperative course was uneventful; the patient experienced immediate improvement in mobility of the lower limbs (Nurick Grade 0), pinprick and light touch sensation, and sphincter function, which returned to normal. Somatosensory function was altered in the left T-6 spinal nerve. After 32 months, the patient remains symptom free. Follow-up MRI showed total excision of the lesion, no recurrence, and a slight increase in the thoracic kyphosis angle (Fig. 2).

Pathological Examination. Macroscopically, the tumor tissue was demarcated and encapsulated. Microscopic examination of the lesion showed the presence of prominent bundles of mature fibrous tissue traversing the fatty lobules (Fig. 3), incorporating entrapped fascicles of nerve and blood vessels. The histological diagnosis was neural fibrolipoma.

Discussion

Neural fibrolipoma (also known as fibrolipomatosis of the nerve, fibrolipomatous hamartoma, or perineural lipoma) is a benign tumor of the peripheral nerves originating from the perineural tissue. The lesion is characterized by varying degrees of fibrous and fatty tissue, which grows between entrapped fascicles that are macroscopically normal. This process leads to fusiform enlargement of the nerve.19,27 These tumors localize more frequently in the subcutaneous tissue of the upper limbs at the level of the median nerve, but can also occur in the deep soft tissues.10,12,15,25 Rarely, the ulnar and peroneal nerves are...
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involved.1,14,31 Symptoms result from pressure on the corresponding nerve, leading to neuropathy similar to nerve entrapment syndromes. When the lesion occurs in the chest wall, origin from a thoracic nerve should be suspected.3 Proximal extension to the level of the spinal foramina has been observed.27 Intraspinal neural fibrolipomas are exceedingly rare. Thus far, only one case of fibrolipoma involving the spinal canal, that of a 55-year-old man, has been described in the literature.16 At the time of hospital admission, the patient was unable to walk and presented with sensory impairment below the T-4 level. Surgery was performed with total removal of a bleeding, soft extradural tumor. The lesion was localized in the posterior T3–4 interspace. Histological examination showed fat cells and fibrous connective tissue with many vessels, prompting a final diagnosis of angiofibrolipoma. The postoperative course was uneventful and the patient recovered. After 6 months of follow-up the patient was fully employed.

In our patient, the fibrolipoma was intraneural, with fat interdigitating the nerve fascicles of the thoracic nerve in the foramen; it extended from the epidural space to the thoracic cavity and had a dumbbell appearance. Preoperatively this lesion resembled a typical schwannoma, but preoperative MRI showed an area of high signal intensity in the vertebral body of T-6 on T2-weighted images. This finding is nonspecific, and, after histological examination, we interpreted it as bone marrow edema. The bone marrow edema was present to a lesser extent on postoperative MRI. Benign spinal tumors producing bone marrow edema include osteoblastoma, osteoid osteoma, and hemangioma. Fibrolipoma may be added to that list. Because the lesion adhered slightly to the pleura and the aorta, it was possible to dissect it free from these structures using the costotransversectomy approach. Resection of the thoracic nerve embedded in the lesion is mandatory if total removal must be performed. When the peripheral nerve is markedly altered by the infiltrative fibrous and fatty tissue in the epineurium, it is nearly impossible to achieve total removal of the fibrolipoma while leaving the residual nerve intact. As a consequence, somatic motor and sensory innervation to the skin, parietal pleura, and intercostal and subcostal muscles was damaged in our patient.

In patients with fibrolipoma originating from the median nerve at the carpal tunnel, conservative surgery with simple decompression may provide adequate relief of symptoms.4,27,29 Recurrence appears to be very rare.7,13,26 Conservative treatment cannot be used in neurosurgical patients with progressive spinal cord compression syndrome. In patients undergoing costotransversectomy for spinal tumors, spinal instrumentation and fusion is a matter of debate. No stabilization policy can be adopted after the removal of a benign spinal lesion that does not involve the vertebral body, even when costotransversectomy is used.5,11,23 Some surgeons prefer to add spinal instrumentation.2,22,28 Obviously, in malignant tumors undergoing laminectomy and costotransversectomy, spinal instrumentation must be planned in conjunction with the surgical treatment.3,18 In our patient, spinal instrumentation was not used in the operating theater because we believed that unilateral facetectomy would not alter vertebral stability, although the lesion was found at the apex of the patient’s thoracic kyphosis. After many months the patient is symptom free, but early postoperative MRI showed a slight increase in the thoracic kyphosis angle. This finding appears unchanged in 3 subsequent MRI studies, and the patient is being observed.

Disclosure

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

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