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MAGNETIC RESONANCE IMAGING OF A HIGH CERVICAL INTRADURAL LIPOMA

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Abstract—A case of intradural spinal lipoma, rarely seen in the high cervical region, is described. Extension into the posterior fossa is not infrequent with these rare tumors. Magnetic resonance imaging clearly showed the longitudinal dimension of the tumor as well as the infiltrative extension into the spinal cord without any invasive procedure.

Key Words: Magnetic resonance imaging, Lipoma, Spinal cord neoplasm

Intradural lipomas are rare and commonly associated with spinal dysraphism (1) or other congenital anomalies (2). As isolated phenomena intradural lipomas are commonly located in the thoracic or cervicothoracic region (2, 3). They are rarely found in the high cervical region (4) and only 23 such cases are reported in the literature (2, 4–7). We report a case of high cervical intradural lipoma which was well demonstrated by magnetic resonance (MR) imaging.

CASE REPORT

A 30-year-old man presented with progressive weakness in his extremities and recent onset of neck spasm. He had been diagnosed at infancy with cerebral palsy. Neurological examinations revealed severe weakness and decreased joint proprioception of the lower extremities bilaterally, and mild weakness of the upper extremities.

Radiographs of the cervical spine showed abnormal widening of the spinal canal from C1 to C3. On computed tomography (CT), the expanded spinal canal was filled with a homogeneous material of fatty density (Fig. 1). The spinal cord was seen displaced to the ventral part of the canal. A T1-weighted MR imaging at 0.5T revealed a well demarcated intradural mass of high signal intensity extending from the level of the foramen magnum to C2 (Fig. 2). The spinal cord and medulla oblongata were anteriorly displaced and compressed by the lesion. A part of the tumor seemed to infiltrate the spinal cord. On T2-weighted images (not shown), the extent of the tumor was less clearly defined than with T1-weighted images and there was a localized area of high signal intensity in the compressed portion of the spinal cord suggestive of edema or gliosis. The signal intensity of the lesion was consistent with that of subcutaneous fat on both T1- and T2-weighted images.

At operation, an intradural lipoma was only partially resected because of its extension into the spinal cord. The postoperative course was uneventful. One month after surgery, the patient's weakness of his extremities was slightly improved. Minimal neck spasm also persisted. The follow-up MR study at 1.5T showed a residual lipoma approximately 50% of its original size (Fig. 3).

DISCUSSION

Intradural (subpial) spinal lipomas unassociated with dysraphism are uncommon, and they account for 1% of all spinal cord tumors. In 1975, Giuffrè analyzed 154 cases which were reported between 1876 and 1972 (2). Fan et al. (5) reviewed 119 cases including 16 cases which were not in the Giuffrè series. We found an additional 15 cases in the literature (6–15), thus expanding our review to 186 cases including this case reported.

Intradural lipoma is slightly commoner in males (male 101, female 75). Initial symptoms usually develop before the age of 30 years and show nearly equal distribution within the lst, 2nd, and 3rd decade (25%, 22%, and 24%, respectively). One of the significant clinical features of intradural lipomas is the long duration of symptoms that exceeded 3 years in more than half of the cases (54%). A slow ascending spastic monoparesis or paraparesis is the commonest initial symptom in cases of lipomas affecting the cervical or thoracic region.

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Fig. 1. Computed tomography of the spinal canal at the level of C1 vertebral body. The spinal canal is filled with a mass of fatty density and the spinal cord is compressed anteriorly.

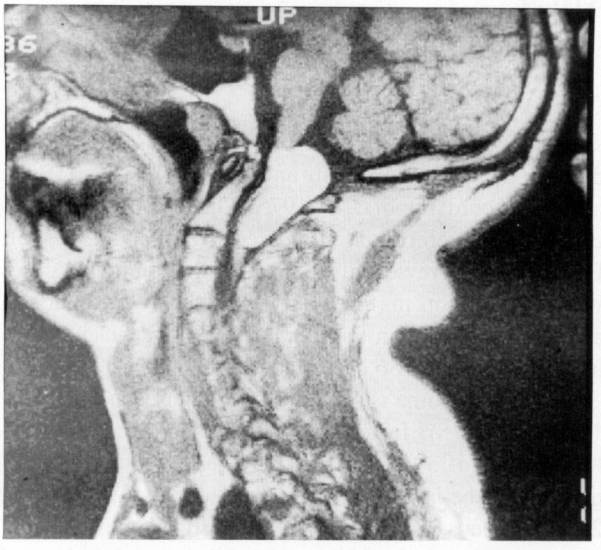

Fig. 2. Sagittal T1-weighted MR imaging of cervical spine (SE 500/20).There is a mass of high signal intensity consistent with that of subcutaneous fat noted from the level of foramen magnum to C2.

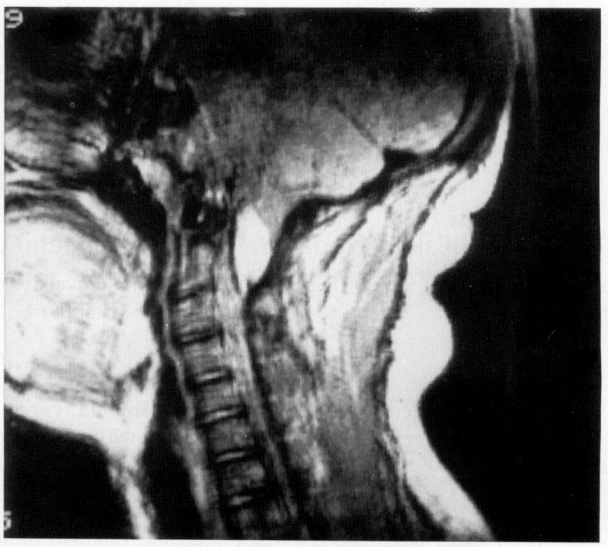

Fig. 3. Postoperative follow-up study with proton density weighted MR image (SE2500/25). The residual tumor is clearly shown and there is a linear low signal intensity anterior to the high intensity mass presumably due to a chemical shift artifact.

Intradural lipomas characteristically involve the posterior aspect of the spinal cord, with common locations in the thoracic (31%), cervico-thoracic (23%), and cervical region (18%). The tumors usually extend over at least 4 or 5 vertebral body segments of the cord (2). Nearly the entire cord was involved in 9 patients (5%). Twenty-four of the cases which we reviewed (13%) showed definite high cervical involvement. Extension into the posterior fossa was identified in 13 of the 24 (54%).

The pertinent finding on spinal radiographs is local widening of the spinal canal (2). Myelograms usually show total block or an intradural filling defect. CT is specific for fatty tissue and is useful in the diagnosis and assessment of the extension of the lipomas (5). However, with CT intrathecal contrast media is often necessary to demonstrate the intradural location of the tumor, and it may be difficult to study the entire length of the lesion especially in cases with long segmental involvement. Recently, MR imaging has been used widely to evaluate spinal tumors. Several reports have described with intradural spinal lipomas (6–11). Contrary to CT, MR imaging clearly demonstrates the intradural location and the relation of lipomas to the spinal cord without the performance of any invasive procedures. MR imaging in the sagittal or coronal plane facilitates the estimation of longitudinal extension of intradural tumors (6–11). Corr et al. (7) reported a case of spinal lipoma of the entire spinal cord in which the involvement was clearly delineated on MR images . In cases of high cervical lipomas,

MR imaging can clearly demonstrate the presence of posterior fossa extension (6). Benign lopomas have similar signal intensity to that of subcutaneous fat on T1- and T2-weighted images and are particularly well demonstrated on T1-weighted images. Chemical shift misregistration artifacts due to fat may also help to diagnose a lipoma with a high-field-strength unit as shown in our patient, but the relation of the lipoma to surrounding structures may be obscured.

Complete excision of spinal lipomas can seldom be accomplished because of their infiltrative nature (3). Such infiltrative extension of lipomas can be demonstrated on MR imaging. MR imaging also can be useful in assessing the residual component of lipomas postoperatively.

SUMMARY

A case of an intradural spinal lipoma in the high cervical region was reported. MR imaging played an important role in describing the nature and extension of the tumor. It also provided invaluable information regarding post-operative residual components of a lipoma.

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REFERENCES

1. Taviere, V.; Brunelle, F.; Baraton, J.; Temam, M.; Pierre-Kahn, A.; Lallemand, D. MRI study of lumbosacral lipoma in children. Pediatr. Radio. 19(5):316–320; 1989.
2. Giuffrè, R. Spinal lipoma. In: Vinken, P.J.; Bruyn, G.W., eds. Handbook of Clinical Neurology, Vol. 20. New York: Elsevier; 1975:389–414.
3. Thomas, J.E.; Miller, R.S. Lipomatous tumors of the spinal canal: A study of their clinical range. Mayo Clin. Proc. 48(6): 393–400; 1973.
4. Drapkin, A.J. High cervical intradural lipoma. J. Neurosurg. 41(6):699–704; 1974.
5. Fan, C.J.; Veerapen, R.J.; Tan, C.T. Case report: subdural spinal lipoma with posterior fossa extension. Clin. Radiol. 40(1):91–94; 1989.
6. Mori, K.; Kamimura, Y.; Uchida, Y.; Kurisaka, M.; Eguchi, S. Large intramedullary lipoma of the cervical cord and posterior fossa: Case report. J. Neurosurg. 64(6):974–976; 1986.
7. Corr, P.; Beningfield, S.J. Magnetic resonance imaging of an intradural spinal lipoma: A case report. Clin. Radiol. 40(2): 216–218; 1989.
8. Kean, D.M.; Smith, M.A.; Douglas, R.H.B.; Martyn, C.N.; Best, J.J.K. Two examples of CNS lipomas demonstrated by computed tomography and low field (0.08T) MR imaging. J. Comput. Assist. Tomogr. 9(3):494–496; 1985.
9. Lantos, G.; Epstein, F.; Kory, L.A. Magnetic resonance imaging of intradural spinal lipoma. Neurosurgery 20(3):469–472; 1987.
10. Wright, J.F.C.; Powell, S.; Williams, M.P. Case report: Spinal cord compression caused by dural pathology: A close shave with Ockham's razor. Clin. Radiol. 39(5):558–559; 1988.
11. Tsuchiya, K.; Michikawa, M.; Furuya, A.; Furukawa, T.; Tsukagoshi, H. Intradural spinal lipoma with enlarged intervertebral foramen. J. Neurology Neurosurgery Psychiat. 52(11):1308–1309; 1989.
12. Liebeskind, A.L.; Azar-Kia, B.; Batnitzky, S.; Scechte, M.M. Intraspinal lipomas. Neuroradiology 7(3):197–200; 1974.
13. Schroeder, S.; Lackner, K.; Weiand, G. Lumbosacral intradural lipoma. J. Comput. Assist. Tomogr. 5(2):274; 1981.
14. McGillicuddy, G.T.; Schucart, W.; Kwan, E.S.K. Intradural spinal lipomas. Neurosurgery 21(3):343–346; 1987.
15. Ammerman, B.J.; Henry, J.M.; De Girolami, U.; Earle, K.M. Intradural lipoma of the spinal cord: A clinicopathological correlation. J. Neurosurg. 44(3):331–336; 1976.

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