Cervical Intramedullary Lipoma not Associated with Spinal Dysraphism: Case Report

Spinal Disrafizm Olmaksızın Servikal İntramedüller Lipoma: Vaka Takdimi

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Abstract: Intramedullary lipomas are slow-growing congenital tumors that are usually not amenable to complete resection. In this article, we present a rare case of cervical intramedullary lipoma not associated with spinal dysraphism.

Key words: Lipoma, spinal dysraphism, spinal intramedullary tumor

Özet: İntramedüller lipomlar, yavaş büyüyen konjenital tümerler olup genellikle tümüyle çıkarılmaya uygun değillerdir. Bu makalede, nadir bir spinal disrafizm olmaksızın servikal intramedüller lipoma vakasını sunuyoruz.

Anahtar kelimeler: Lipoma, spinal dysraphism, spinal intramedullary tumor

INTRODUCTION

Spinal lipomas not associated with spina bifida are relatively rare, and account for only 1% of all spinal cord tumors (1,6,7). It is also rare to find a spinal lipoma in an intramedullar location. Such lesions are congenital tumors that usually present as slow-growing masses (1,4). Despite their benign nature, lipomas are usually not amenable to complete resection. Most are localized at intradural (60%) or extradural (40%) sites. This report describes a case of intramedullary lipoma in the cervical spinal cord.

CASE REPORT

A 40-year-old man was admitted to our hospital with the complaints of unsteady gait and weakness in the upper and lower extremities. His problems had grown worse over a 3-year period. The earliest complaints were pain and paresthesia in the left lower extremity. The time between the onset of symptoms and establishment of the diagnosis was 3 years. The patient's condition had deteriorated rapidly in the year prior to admission, and 3 months before he came to our hospital he developed difficulty walking, and urinary retantion became a serious problem. His medical history included surgery under local anesthesia for a cervical subcutaneous lipoma 20 years earlier.

The patient's general physical examination was unremarkable. He had a lean body condition, he reported no tenderness over the cervical vertebral column, and there was no evidence of spinal root irritation. The pathologic findings on neurological examination were as follows: spastic quadriparesis that was most prominent on the left side, hypoesthesia below C5, absent abdominal reflexes in all quadrants,

exaggerated deep tendon reflexes on the left side, bilateral Hoffmann's sign, and a positive Babinski's sign in the left leg. There was reduced vibration and position sense in the left toe and ankle. Rectal tone and sensation were both normal. The patient also exhibited Romberg's sign, as well as spastic-ataxic type gait disturbance.

Routine laboratory studies yielded normal values. Plain radiographs showed that the cervical spinal canal was wider than normal, but there was no evidence of bone destruction. Magnetic resonance imaging (MRI) revealed a 2.0x2.7x8.5 cm intramedullary mass lesion between C1 and C5. The lesion was hyperintense on T1-weighted (W) images, but the signal was less intense on T2W images, indicating the presence of fat tissue (Figure 1A-B). The mass filled the spinal canal. It appeared to be located in a juxtamedullary position posterolateral to the spinal cord, and was displacing the cord anteriorly and to the right. There was no clear demarcation between the spinal cord and the mass lesion (Figure 2). The MRI features led to a straightforward diagnosis of intradural lipoma. A chemical shift artifact was noted adjacent to the mass lesion (Figure 1B).

Surgery:

Laminectomies were performed at C2 through C6. This exposed a subpial tumor in the left posterolateral portion of the cervical spinal cord. The posterior nerve roots were involved bilaterally. The lack of a cleavage plane was the main difficulty in performing the resection. Extensive debulking of the tumor was achieved with the guidance of an operating

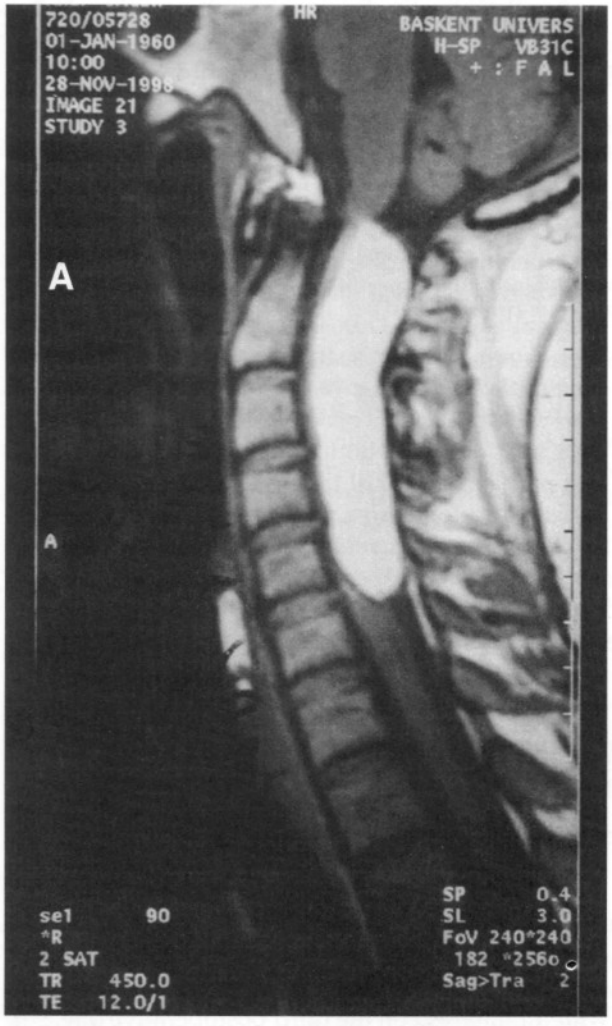

Figure 1 a-b: A pre-contrast sagittal T1W image demonstrates a homogeneous, well-defined, hyperintense, intradural spinal cord mass between C1 and C5 (A). A T2W sagittal image shows that the mass lesion is less intense compared to the T1W images, and that it has lobular contours. Also note the hypointense chemical shift artifact mimicking a tissue plane between the mass and cord (B).

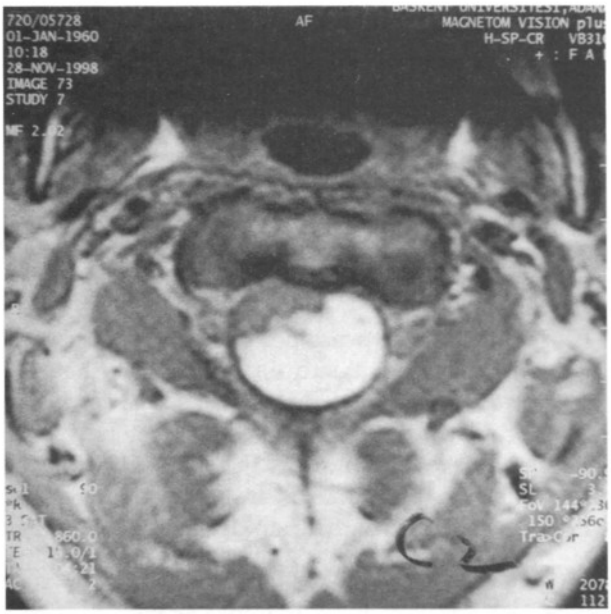

Figure 2: A transverse T1W image demonstrates the mass filling the dural space but showing no extradural or intracranial extension. The spinal cord is displaced anteriorly and to the right by what appears to be a? juxtamedullary, posteriorly located lipoma.

microscope, and the procedure was done using microsurgical instruments only. The final step of the operation was extensive duraplasty. Histological examination confirmed the tumor was a lipoma. The postoperative course was uneventful, and the patient was discharged on day 7 post-surgery with improved left hand strength and better walking ability.

DISCUSSION

Gowers was the first to describe an intraspinal lipoma in 1876 (5). Guiffre's 1966 review stressed that most spinal lipomas are subpial, and are never completely enclosed by neural tissue (4). The more common lipomatous malformations associated with spinal dysraphism have been extensively reviewed in the literature (1,14); however, intramedullary lipomas not associated with spina bifida or cutaneous malformation have only been described as isolated cases (6,7,15,16). The classical location of these tumors is intradural, and they may be intramedullary, extramedullary, or a combination of the two. These lesions have a predilection for the cervical and thoracic region, but may involve the entire length of the cord (5) and extend to the foramen magnum (8,9,10,11,12).

Experience with imaging of isolated lipomas is very limited because such lesions are rare. The low density of the fat tissue produces the pathognomonic appearance of lipoma on computed tomography. The characteristic MRI findings for lipomatous tissue are a relatively high signal on T1W images and a relatively low signal on T2W images. With this type of imaging, it is also possible to demonstrate the site where the lipoma passes through the dura. Although lipomas may tend to adhere to the surface of the cord, a chemical shift artifact may erroneously suggest the presence of a thick fibrous tissue plane between the cord and the lipoma (13).

Adhesion of lipoma tissue to the adjacent neural parenchyma is common, and attempts to remove all of the mass can lead to parenchymal injury, sometimes resulting in impaired neurological function immediately after surgery. Recent technical advances, such as the operating microscope, ultrasonic aspirator, and surgical laser, have significantly improved surgical outcomes for patients with intraspinal tumors. The ultrasonic aspirator is very valuable for debulking of intramedullary lipomas (3,17,18). However, because this instrument also creates significant vibration, it can be hazardous when treating lipomas that are adherent to the nerves and spinal cord. Fujiwara reported good postoperative neurological status in three of four cases after partial removal of lipomas using an ultrasonic surgical aspirator (15). Laser surgery is especially useful for treating these tumors, and may be effective for gentle debulking (9,18,19,20,21). Xu reported marked improvement or recovery in 45 of 58 cases after laser treatment (21). Both Heary and Crols concurred that partial removal of the lipoma does not impair a patient's postoperative neurological status (2,14). In contrast, Lee et al. stressed that all their patients who had significant preoperative neurological deficits and underwent surgical resection had very poor prognoses, and did not improve in the postoperative period (3).

In our case, the tumor was intramedullary and was firmly blended with the cord, with the spinal roots embedded in the adipose tissue. During surgery, we encountered the known difficulties posed by the absence of a cleavage plane and adhesion of tumor tissue to neural structures. We opted to extensively debulk our patient's lipoma using an operating microscope, and were able to avoid damage to adjacent structures. In the postoperative period, the patient's condition improved rapidly, and he was able to walk with minimal aid on the third postoperative day.

Many authors claim that the extent of tumor removal in these cases does not influence long-term results, and that total excision of the lipomatous lesion

is difficult and may not be necessary to alleviate symptoms (1,3,7,10,14,16,17,18). Based on the results in our case and others in the literature, we too believe that total removal of intramedullary lipomas is unnecessary. The main purpose of surgery in such cases is to decompress the adjacent neural structures.

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Clinical outcome differences for lipomyelomeningoceles, intraspinal lipomas, and lipomas of the filum terminale.

Bulsara KR, Zomorodi AR, Villavicencio AT, Fuchs H, George TM.

Lipomyelomeningoceles, intraspinal lipomas, and filum termniale lipomas have different clinical outcomes following operative intervention. Patients show improvement in motor strength following operative intervention. Greater improvements in sensory, bladder, and pain scores are associated with filum terminale lipomas. The least improvements in these categories are seen in the lipomyelomeningocele group. Motor strength is the most likely deficit to improve following operative intervention.