Atypical Presentation of a Lumbar Intradural Breast-Cancer Metastasis: A Case Report with Literature Review*

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ABSTRACT

AIM: Non-neural intradural metastases are extremely rare. Approximately 6% of spinal metastases are intradural. Adenocarcinoma metastasis is not reported in the literature. A case with adenocarcinoma metastasis, extending from lower thoracal zone to sacral region, and literature investigations will be discussed.

MATERIAL AND METHODS: Fifty-five years old female patient has loss of strength in legs, gait disorder and urinary incontinence, which have been persisting for one month. On magnetic resonance imaging, a diffuse mass lesion with atypical heterogeneous intradural contrast fixation is found, which is located at level Th12 and extending to the level S1.

RESULTS: Laminotomy was performed at level T12 to L5 for the patient, who has radiological preliminary diagnosis of ependymoma. It was observed that intradural lesion was rigidly surrounding all fibers. Biopsy specimen was obtained and the surgery was terminated. Adenocarcinoma metastasis was considered on pathological examination.

CONCLUSIONS: Lumbar intradural tumors (LIT) are usually primary tumors. It is challenging to differentiate metastasis cases from primary tumors in radiological terms. Entire neural system and body screening may be required, considering possibility of metastasis in suspicious cases.

KEY WORDS: Adeno carcinoma, breast tumors, intradural, metastasis, spine tumors

INTRODUCTION

Intradural spinal tumors are usually primary tumors, and schwannoma, ependymoma and meningioma are most common ones at lumbar localization. Intradural metastasis accounts for very low percent of spinal metastases (7,15). Approximately 6% of spinal metastases are intradural. Most metastases are solitary lesions in configuration. Adenocarcinoma metastases are frequently originating from lung and breast. Intradural metastases reported in the literature are usually solitary renal cell carcinoma metastases (13-15,18).

In current study, we present a case with intradural adenocarcinoma metastasis, which originated from lower thoracal region and involves entire lumbar spine, along with literature discussion.

CASE REPORT

Fifty-five years old female patient has complaints of loss of strength in bilateral legs, gait disorder and urinary incontinence, which have been persisting for one month. Patient was specifying bilateral leg pain, similar to feel of burn in nature, and prickling, which occur at night after patient goes to bed, for last 15 days. On neurological

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examining motor strength is 4/5 in the lower limb, while deep tendon reflexes are normoactive. Babinski sign is negative. Lumbosacral X-ray findings appear normal. On magnetic resonance imaging (MRI) of thoracic and lumbosacral spines, a mass lesion is observed, which is extending from Th12 to S1 at intradural localization and infiltrates intradural zone, and extra- or intra-medullar differentiation cannot be made at level Th12 to L2. Signal pattern of the lesion is iso- or hypo-intense on T1-weighted images, iso- or hyper-intense on T2-weighted images, and diffuse contrast uptake is found, after Gadolinium is administered via intravenous route (Figure 1). On MRI of head and the spine, there is no impression to suggest tumor at other localizations.

Adenocarcinoma metastasis is reported for postoperative biopsy specimen, and systemic screening is performed for the patient. Breast biopsy specimen is obtained, after a lump is found in right breast. Adenocarcinoma metastasis is reported for postoperative biopsy specimen, and systemic screening is performed for the patient. Patient is followed up at Department of Oncology, and patient is independently ambulatory on postoperative Month 11th.

Surgery

Multi-level laminoplasty combined with total excision of tumor is planned in order to facilitate postoperative radiological follow-up and minimize possibility of instability, since the lesion has intradural localization and radiological preliminary diagnosis is ependymoma. Laminotomy was performed at level Th12 to L5. When dura was incised, it was observed that the mass was totally invading all nerve fibers. Frozen section was reported as metastasis, and dura was closed, after biopsy specimen was obtained, since total excision of tumor was not possible without a neural damage. Laminas were fixed (Figure 2).

Histopathological diagnosis was reported as adenocarcinoma metastasis (Figure 3).

On postoperative neurological examination, no extra sensorimotor deficit is found. Since histopathological diagnosis is reported as metastasis, it is found that primary focus is breast.
DISCUSSION

Spinal metastasis is observed in 5-10% of cancer patients. Intradural metastases are found only in 5% of those patients (9). Intradural spinal cord metastases originate from lung, breast, colon and rectum, prostate gland, kidney and malignant melanoma in decreasing frequency. Recent advances in oncology and surgical treatment prolonged mean survival for many types of cancers. This condition resulted with the fact that metastases are more commonly found at rare anatomic localizations (18).

There are scarce studies on large case studies of intradural spinal metastases in the literature (16). Metastasis cases are usually in the form of case studies involving one or several cases (2,3,18). Kocialkowski et al. reported in a large study of spinal metastasis (n=70) that breast adenocarcinoma accounts for 24% of metastases. Mean survival is 35.8 months in patients, who undergo decompressive surgery (16). Similar to other metastasis cases, localization and pathology of primary tumor are the most significant factors, which determine the survival (3,14,16). Patients with breast and kidney metastasis are characterized with longest survival in comparison with other primary tumors (1,12).

One thousand forty one spine and spinal cord tumors are diagnosed at our clinic within six years. Among them are 23 (16.3%) patients with spine and intradural metastases. Intradural metastasis is noted only in 3 (2.1%) of metastasis cases.

Although metastases are most common in lumbar region and least common in cervical region, thoracal metastases can be early diagnosed, since symptoms are manifested at early stage (9). Distribution of breast adenocarcinoma metastasis is compatible with that of other tumors, and similar to extradural metastases, they are more common at thoracic and lumbar regions (16,22).

It is known that extradural tumor metastases usually have arterial or venous origin. However, mechanism of dissemination cannot be clearly understood for intradural metastasis. However, it is considered that spinal nerve roots, transdural invasion, hematogenic dissemination or CSF facilitate the dissemination (20). Breast adenocarcinoma metastases are among tumor groups, which are commonly metastasing via arterial, lymphatic and local dissemination. Preferring arterial dissemination for spinal metastasis, those tumors are probably using this route also for intradural metastasis (7).

Extradural metastasis of breast are usually observed at cervical or thoracal localization (5,25). However, thoraco-lumbar involvement is not observed in our case.
Similar to patients with other primary intradural tumors, most common complaint of patients with intradural metastasis is pain. There is a typical pain, which is characterized with minimal onset, aggravates with pressure of spinal area and is progressive in nature. Similar to other spinal cord tumors, most common symptoms include loss of motor function, sphincter problems and sensorial disorders along with pain (20). The first symptom was pain in our case. This was followed by sensorimotor deficit.

X-ray, CT, MRI and contrast-enhanced MRI are used for diagnosis. Positron Emission Tomography (PET-CT) is another important adjunct diagnostic tool, which is efficiently used in metastasis cases. Use of MRI for many disease resulted with increased possibility to diagnose incidental primary and metastatic intradural lesions at early stage. For our case, diagnosis is made with MRI of lumbar spine, which is scanned for investigating etiology of low back pain and loss of strength in leg, while history of primary tumor is not known. However, ependymoma is primarily considered, rather than a metastasis case, in the light of MRI findings. Conventional radiological finding of intradural extramedullar lesions include ipsilateral expansion of subarachnoid space and contralateral bowing in the spinal cord. This impression is observed approximately in 80-90% of meningioma and nerve sheath tumors. However, different impressions can be observed in metastatic lesions, infection, inflammatory disease, epidermoid and dermoid tumors and lipomas as well as arachnoid cysts (2,4).

From radiological perspective, ependymomas are surrounded by hypointense pseudocapsule on T1-weighted and T2-weighted images in MRI. Tumor is expanding the spinal cord. Signal pattern is usually isointense and rarely hypointense on T1-weighted images, while spinal cord demonstrates hyperintense signal on T2-weighted images. Homogeneous contrast fixation is observed, after Gadolinium is administered. Tumor may have heterogeneous appearance secondary to cystic and hemorrhagic components. Mixopapillary ependymoma is the most common type of ependymoma at lower thoracic and lumbar localizations. Mixopapillary ependymomas may appear like conus tumors confined to one or two segments, while they may be also characterized with giant mass lesions, which extend from lower thoracic zone to S2 segment, where dural sac terminates (17,23).

For intradural metastasis, MRI images may vary from tumor pathologies. Signal pattern will be hyperintense on T1-weighted images, if metastasis is comprised of tumor cells with intensive mucoid content, such as breast and colon cancer. Intensive contrast fixation can be also observed in postcontrast series, while a ring-like heterogeneous involvement can be observed. Mostly, hyperintense signal is noted on T2-weighted images (1,6,8,10,19). It can not only expand the spinal cord, but it may also show more prominent infiltration and peripheral edema in comparison with ependymoma. Similar to primary spinal cord tumors, solitary conus medullaris tumors tend to expand the spinal cord and fibers. However, similar to our case, diffuse cases can be differentiated from ependymomas, since they expand such that fibers are involved, such as conus lipomas (1).

Management of patients with spinal metastasis has two main aims. First one is pain control or elimination, and the other is protecting or improving neurological condition (24). Common therapeutic approach includes chemotherapy and decompressive surgery for patients with spinal metastasis. Surgery is the primary therapeutic approach for patients, who have no pathological diagnosis, are not hypersensitive to radiotherapy and whose neurological findings show progressive worsening (3,22).

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**CONCLUSION**

Recently, radiological diagnostic tools are highly guiding for intradural spinal intra-medullar and extra-medullar mass lesions. However, preoperative findings may vary from pathological diagnosis. Therefore, surgical approach is important not only for management, but also for diagnosis. Behavior of primary tumor and condition of the patient are two important factors, which influence decision of surgical treatment and determines type of surgery.
REFERENCES


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