

Intramedullary Spinal Cord Involvement from Metastatic Gastric Carcinoma: A Case Report

Intramedüller Spinal Kordu Tutan Metastatik Mide Karsinoması: Bir Olgu Sunumu

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ABSTRACT

Intramedullary spinal cord metastasis (ISCM) is a rarely seen complication of cancer. We report a case of ISCM from gastric cancer. A 42-year-old male presented with a rare intramedullary spinal cord metastasis from gastric carcinoma manifesting as rapidly worsening motor and sphincter disturbances. The primary tumor had been treated 2 years previously. Magnetic resonance imaging (MRI) revealed the tumor localized in the thoracic spinal cord. The tumor was totally removed. The histological diagnosis was gastric adenocarcinoma. He has been stable postoperatively. Surgical treatment may be considered for cases with even rapid-growing tumors such as gastric carcinoma with no evidence of multi-organ dissemination, especially when presenting with progressive neurological deterioration.

KEYWORDS: Gastric adenocarcinoma, Intramedullary tumor, Metastasis, Spinal cord

ÖZ

Intramedüller spinal kord metastazı, kanserin nadir görülen bir komplikasyonudur. Bu makalede mide kanserinin neden olduğu intramedüller spinal kord metastazlı bir olgu sunuldu. 42 yaşında erkek olguda mide kanserinin nadiren oluşturduğu intramedüller spinal kord metastazı, hızla kötüleşen motor ve sfinkter kusuru ile belirti verdi. Olgunun primer tümörü 2 yıl önce tedavi edilmişti. Manyetik rezonans görüntülemeye tümörün torakal spinal korda lokalize olduğu saptandı. Tümör total olarak çıkartıldı. Histolojik tanı mide adenokarsinoması olarak rapor edildi. Hasta ameliyat sonrası stabil seyretti. Çoklu organ tutulumu tespit edilemeyen mide karsinoması gibi hızlı büyüyen tümörlerde, özellikle de ilerleyici nörolojik kötüleşmeyle beraber olan vakalarda cerrahi tedavi tercih edilebilir.

ANAHTAR SÖZCÜKLER: Mide adenokarsinomu, İntramedüller tümör, Metastaz, Spinal kord

INTRODUCTION

Metastatic involvement in the spinal cord has been infrequently reported as one of the manifestations of generalized metastases from various kinds of malignancies with an incidence of approximately 2% (4). Lung and breast are the most common primary sources (3). The gastrointestinal tract gives rise to a wide variety of anatomically and histologically very distinct malignancies (10). In 1996, the World Health Organization reported that gastric cancer was the second most commonly occurring cancer (15). The most common metastatic sites of gastric carcinoma are the liver, regional lymph nodes, bone, and adrenal gland. Intramedullary spinal cord metastasis from gastric carcinoma is an extremely rare phenomenon (7,12). Hereby, we report a case of a patient with gastric carcinoma developing a metastasis into the spinal cord.

CASE REPORT

This 42-year-old man presented to our division with a 1-month history of back pain and a 1-week history of paraparesis and urinary incontinence. On neurological examination, T6 level

sensory loss was demonstrated with paraparesis (grade 1–2/5), and numbness of lower limbs. The medical history revealed that a rectal metastasis of gastric adenocarcinoma with was first treated surgically 5 years before, which was followed by proximal gastrectomy in 2008. Surgery had been followed by chemotherapy and radiotherapy. In our clinical follow-up, the patient showed a progressive worsening of symptoms.

The cervical and the thoracic vertebrae magnetic resonance imaging showed an intramedullary lesion, 3 cm in length, at the T5–T7 level. The tumor was hypointense on T1-weighted images, and hyperintense on T2-weighted sequences, with a remarkable homogeneous contrast enhancement after administration of gadolinium (Figure 1A, B). In addition, a syringomyelia occurring proximal to the tumor and a markedly edema in all spinal cord segments was also shown in MRI. MRI for screening of intracranial pathology revealed no pathological lesion. Whole body scans with thallium-201 chloride and technetium-99m hydroxymethylene diphosphonate disclosed no definite abnormal uptake.

Within a few days of admission, he was unable to move either lower extremity or to void urine. A T4–T7 laminectomy was performed after a high-dose steroid course of 2 days. Under a microscope, we carried out a dorsolateral myelotomy with a 2-cm incision, and a red-to-gray tumor was observed.

The tumor was excised nearly totally using surgical microscope and ultrasonic aspirator. Great care was taken during the surgery not to damage the spinal cord and nerve roots. He was thereafter transferred to hospice/rehabilitation care. After additional radiation therapy at postoperatively 3 month follow-up period, urinary continence was not restored and the neurologic status showed minimal improvement.

PATHOLOGY

Pathological examination demonstrated a red-to-gray mass in glial tissue. In the tissue fragments, the tumor was composed of atypical cells with pleomorphic nucleus which had large hyperchromatic nuclei with eosinophilic nucleoli. The neoplastic cells were arranged in a complex adenoid structure with adenocarcinoma morphology (Figure 2). The adenocarcinoma cells on the tissue slide displayed immunoreactivity to cytokeratin (7/20) and CDX-2 on immunohistochemical analysis. Pathological diagnosis was adenocarcinoma of gastric origin.

DISCUSSION

ISCMs may occur at any time during the course of the disease. ISCM is much less common than metastatic epidural disease (2). Intramedullary metastatic disease clinically affects only 0.1–0.4% of all cancer patients and compromises only 1–3% of all intramedullary spinal cord neoplasms (3). Gastric carcinoma-related metastasis is extremely rare and only few cases have been reported so far, in the literature (7, 12). Table I summarizes the principal findings of these cases. Two of the reported cases had been treated with surgery and showed a short survival time.

The clinical features of this disease are back pain and signs and symptoms of spinal cord compression, such as hemiparesis or hemisensory impairment (4). The Brown–Sequard syndrome is also commonly observed (9). Symptoms progress rapidly and often lead to complete paraplegia (8). Gadolinium (Gd)-enhanced MRI is the imaging modality of choice, with T2-weighted imaging demonstrating any associated edema (9). Diagnostic evaluations such as plain radiography, myelography, CT, and cerebrospinal fluid examinations are of limited value (9). In the present case, the MR imaging findings of the location of the tumor, the edematous spinal cord, the syringomyelia, and homogeneously enhanced tumor accorded well with the operative findings.

There are three theories on the pathogenesis of ISCM. Haematogeneous spread is believed to account for most cases (1, 4). The second mechanism is related to meningeal carcinomatosis. Tumour cells originating from carcinomatous meningitis may infiltrate the Virchow-Robin spaces of vessels, penetrating the spinal cord and pial membrane and invading the spinal cord parenchyma (11). The third potential method of spread to the spinal cord is by direct extension from nerve roots or cerebrospinal fluid with malignant cells from tumors that are elsewhere in the central nervous system (6). In the present case, haematogeneous spread of the tumor cells may be cause of the involvement of the spinal cord.



Figure 1: Preoperative magnetic resonance imaging: **A)** T2-weighted sagittal images revealed markedly edema in the thoracic segment spinal cord; **B)** T1-weighted postgadolinium sagittal images displaying a syringomyelia occurring proximal to tumor and an enhancing intramedullary tumor located between the fifth and seventh thoracic vertebrae with significant peritumoral edema.

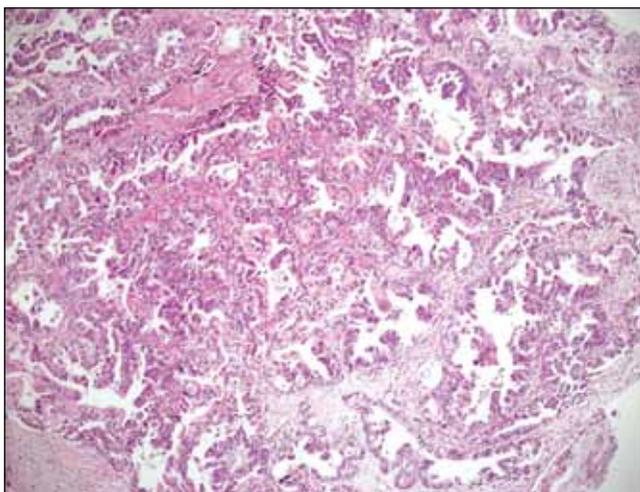


Figure 2: Photomicrograph demonstrating adenocarcinoma of gastric origin: The neoplastic cells are arranged in a complex adenoid structure. H.E. original magnification 100x.

Table I: Reported Cases of Intramedullary Spinal Cord Metastases from Gastric Carcinoma

Author, year	Age, gender	Neurological signs, symptoms	Metastasis location	Treatment	Survival from presentation
Taniura S	51, female	Neck pain, tetraparesis	Cervical	Surgery	2 weeks
Gazzeri R	68, male	Radicular neck pain, Left UE weakness	Cervical	Surgery	6 months
Cemil B	48, male	LE pain, paralysis, urinary incontinence	Thoracic	Surgery	-

There have been no prospective clinical trials on the treatment of ISCM. Treatment options are radiotherapy, chemotherapy and surgery (3). External beam radiation therapy is the most effective treatment option, but its effectiveness depends primarily on the radiosensitivity of the tumor, the duration of symptoms, and the degree of preoperative neurological deficit (13). To avoid the sequelae of external beam radiation therapy, stereotactic radiosurgery can be used as an alternative to treat individual metastatic lesions (14). Surgical treatment other than biopsy is very seldom indicated. Surgery may be appropriate under the following conditions: a) A single encapsulated lesion and controlled systemic growth of a radioresistant tumor in a patient with a life expectancy of at least a few months (5, 14); b) Cases presenting with previously undiagnosed or limited primary tumors and rapid neurologic deterioration (3). It has also been reported that surgical management has led to improved neurological function in patients with rapidly progressive neurological deficits (9). Our patient presented with a 1-month history of progressing myelopathy with no evidence of multi-organ dissemination. We decided to treat our patient surgically because of the acutely escalating motor and sphincter disturbances.

CONCLUSION

ISCM is a rarely seen complication of cancer. The general treatment of intradural metastases is not standardized, since radiotherapy and surgical treatment are assessed differently by various authors. Regardless of treatment, however, many of these patients survive fewer than 3 months (8). Surgical treatment may be considered for cases with even rapid-growing tumors such as gastric carcinoma with no evidence of multi-organ dissemination, especially when presenting with progressive neurological deterioration.

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