Intramedullary Spinal Cord Metastasis of Renal Cell Carcinoma 6 Years Following the Nephrectomy

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ABSTRACT

Intramedullary spinal cord metastasis is an uncommon manifestation of systemic tumor. We present a case of metastatic mass inside the thoracic spinal cord 6 years after nephrectomy because of renal cell carcinoma. The parenchymal lesion was resected totally and the histologic examination confirmed it as renal cell carcinoma metastasis. The patient's neurological function improved apparently until the intramedullary spinal cord metastasis recurred in situ later. The case shows that renal cell carcinoma has the possibility of metastasis into spinal cord even several years after nephrectomy. Any symptom of neurological deficit should alert to a possible intramedullary spinal cord metastasis.

KEYWORDS: Renal cell carcinoma, Spinal cord, Neoplasm metastasis

ÖZ


ANAHTAR SÖZÇÜKLER: Renal hücreli karsinom, Omurilik, Neoplazm metastazı

CASE ILLUSTRATION

A 51-year-old man complained that he felt numbness underneath the nipple level with progressive weakness of both lower extremities for one month. A month ago, he had felt discomfort in his back that was exacerbated on movement. One week after the onset, he felt numbness in his both feet, and soon, the hypoesthesia level rose to the level of nipples. He felt somewhat weak in both feet but still walked by himself, and did not have any problems with urination or defecation in those days. In the third week, the weakness in his both legs progressed to paraplegia. Sphincter continence was preserved, though he had some difficulty with control. In the fourth week the condition deteriorated and the patient became completely non-ambulatory with indwelling catheter. He had undergone left nephrectomy because of renal clear cell carcinoma 6 years ago but he never gone for follow-up.

In the clinic he was found to have a spastic paraplegia of lower extremities with muscle strength of 2/5. Sensory examination revealed hypoesthesia of light touch and temperature sensation below the costal margin and absence of vibration and position in lower extremities bilaterally. Both patellar reflex and ankle reflex were hyperactive. Bilateral Babinski sign was positive. Magnetic Resonance Imaging (MRI) of the spine revealed a parenchymal lesion (17mm x 8 mm) in the T4-5 spinal cord, showing hypointense signal on T1WI and hyperintense signal on T2WI, enhancing homogeneously with intravenous contrast. The lesion was located completely inside the spinal cord in all images (Figure 1A-C).

Because of the rapid progression of neurological deficit and history of renal cell carcinoma, the parenchymal lesion of the spinal cord was suspected of being a metastasis. The lesion was dissected carefully from the parenchyma and removed completely. The pathological diagnosis revealed metastatic renal cell carcinoma. Immunohistochemical staining results displayed AE1/AE3 (+), CD10 (+), EMA (+), P504 (+), RCC (+), Vimentin (+).

When the patient was discharged, he felt less leg weakness and numbness, had better movement control, defecation became normal, and dysuria improved although the catheter was kept. A postoperative MRI was performed and showed total resection of the intraparenchymal lesion (Figure 2A).

He could walk with mechanical assistance and control the sphincter function well until similar symptoms appeared 3
Intramedullary spinal cord metastasis (ISCM) is a rare condition with poor prognosis and a renal origin accounts for about 4% (3,8). To our knowledge there are several detailed reported cases in which the involved segments were the cervical, thoracic or lumbosacral cord (1,5,6,10).

Regardless of the histology, the average time between the diagnosis of primary tumor and ISCM occurrence was 13-21 months (4,9). This is also usually the case with most ISCM of renal origin whereas some occur several years later. Similar to our case suffering from metastasis 6 years after nephrectomy, Ateaque A reported a case with ISMC 11 years after nephrectomy and Fakih reported a case with ISMC 15 years after nephrectomy (2,6). Interestingly, ISCM can also be the first manifestation of occult renal carcinoma (1,5,10).

Weakness of extremities, especially lower extremities, is the most common symptom of ISCM arising from renal origin, followed by paresthesia, back pain, and incontinence (5,6,10). The distinguished feature of ISCM is rapid progression of metastasis (Figure 2B). Under the patient’s strong demands, a second operation was performed to debulk the tumor and alleviate the compression of the spinal cord. This time there was no obvious improvement of his function. The patient abandoned treatment and was discharged.

DISCUSSION

Intramedullary spinal cord metastasis (ISCM) is a rare condition with poor prognosis and a renal origin accounts for about 4% (3,8). To our knowledge there are several detailed reported cases in which the involved segments were the cervical, thoracic or lumbosacral cord (1,5,6,10).
the symptom. Once the neurological deficit occurs, the dysfunction always exacerbates in several weeks unlike primary intramedullary tumors that typically progress slowly.

Without a specific sign on the MRI image, the intramedullary lesion cannot be differentiated from other disorders such as radiation myelitis, paraneoplastic myelopathy, or primary cord neoplasia (3). It has been suggested that positron emission tomography (PET), particularly with fluorine-18 fluorodeoxyglucose, could be used to detect ISCM, and especially those of renal or lung origin.

The adoption of any treatment should be decided according to the individual case and the patient’s wishes must be taken into account (4). Radiotherapy has been regarded as the gold standard for ISCM with or without steroids to reduce edema (8) but its use has been limited to highly radiosensitive tumors such as small cell lung carcinoma or breast carcinoma. Unfortunately, renal cell carcinoma is a radioresistant tumor. In a series of patients who received radiotherapy for ISCM, the survival time for renal origin was the shortest (3 weeks) while it was 24 weeks for cases with a lung origin and 18.7 weeks for those with a breast origin (7). With the development of the microsurgical techniques and intraoperative electrophysiological monitoring, the risk of surgical complications has apparently decreased. It seems that there is a tendency to select microsurgery as the first line of treatment. In the recent detailed reports of operations for ISCM, all patients’ neurologic function improved at various degrees although the prognosis was poor (5,6,10). Traditional chemotherapy was not feasible for ISCM because of the blood-cerebral barrier. Some new targeted inhibitors have been introduced for the treatment of renal cell metastasis.

Even if the tumor is resected totally, recurrent ISCM has been reported in the same localization in the following months (5,6). Our patient had recovered to become ambulatory with good control of sphincter function until 3 months after the first surgery. Because of the satisfactory result of the first operation, the patient strongly urged the neurosurgeons to perform another operation. However, there was little improvement as predicted after debulking the recurrent tumor.

CONCLUSION

Renal cell carcinoma can metastasize into the spinal cord even years after surgery. Any symptom of neurological deficit should alert the physician to intramedullary spinal cord metastasis. The management of ISCM should be decided individually, taking into account the patient’s wishes. If the condition permits, surgery is an option to relieve symptoms and improve quality of life.

REFERENCES