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Malignant Spinal Cord Compression: A 4-Year Retrospective Study

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Abstract **Original Research Article**

Malignant spinal cord compression is defined as an extra or intradural lesion of the spinal cord, most often caused by bone metastases, which is responsible for medullary suffering. Our work is a retrospective study, spread over four years (January 2017- December 2020), on 16 cases of neoplastic spinal cord compression, treated in Moulay Ismail military hospital of Meknes. The average age of the patients was 62.69 years. A clear male predominance was observed with 81.25% of men. Also, 81.3% of patients had documented neoplasia at the time of diagnosis of spinal cord compression. The clinical presentation at admission was paraplegia in 18.8% of patients, paraparesis in 43.8%, and tetraparesis in 6.3%. Rachialgia was present in 83.3% of cases. The lesions were cervical in 6.25% of patients. The etiologies of spinal cord compression in our series were dominated by bone metastases secondary to prostate cancer, found in 50% of our cases. All patients received corticosteroid therapy and radiotherapy. 18.75% of the patients underwent laminectomy with spinal stabilization. The evolution was marked by a complete or partial recovery in 62.5% of our patients.

Keywords: Spinal cord compression, Metastatic, corticosteroids, decompressive surgery, palliative radiotherapy.

INTRODUCTION

The spine is the most common osseous site for metastatic disease, due to the inherent rich vascular supply and extensive lymphatic drainage, Spinal tumors are categorized into extradural tumors, intradural extramedullary tumors, and intradural intramedullary tumors. Malignant spinal cord compression (MSCC) is defined as compression of the spinal cord or cord equina by metastatic or direct spread to the vertebrae that may cause neurological disability. It occurs in up 5-10% of all patients with cancer; however, it is a feature of advanced cancer, most commonly seen in patients with cancers of the breast, lung, and prostate, which comprise 60% of cases. Furthermore, MSCC represents the initial manifestation of malignancy in up to 20% of cases. The incidence is likely to increase alongside improved cancer survival rates [1, 2]. In this article, we report our experience with MSCC.

METHODS

This was a retrospective, observational, descriptive study conducted at the Military Hospital Moulay Ismail in Meknes, Morocco, for 4 years, from January 2017 to December 2020. We included all patients older than or equal to 18 years, with solid malignancies who had MSCC.

The statistical analyses were accomplished by IBM computer using Epi Info version 7.2. Quantitative data were expressed as mean±standard deviation (SD) or median values with range. Qualitative variables were reported as numbers with percentages.

The study was performed according to the second principles of the Declaration of Helsinki and approved by the Ethical Committee of the Military Hospital Moulay Ismail. As it is a retrospective study and no data could lead to the identification of any patient, the request for dismissal of the informed consent was approved by the Ethical Committee.

RESULTS

A total of 16 patients with MSCC were taken care of in the Military Hospital Moulay Ismail in Meknes from January 2017 to December 2020.

The average age of the patients was 62.69 years, with extremes of 46 and 82 years. A clear male predominance was observed with 81.25% of men and

18.75 of women (sex ratio=4.33). 81.3% of the sample had documented neoplasia at the time of diagnosis of the spinal cord compression, while the latter was indicative of tumor pathology in 18.8% of the patients.

The clinical table at admission was paraplegia in 18.8% of patients, paraparesis in 43.8%, and tetraparesis in 6.3%. Rachialgia was present in 83.3% of cases.

An MRI was performed in 87.5% of patients and 12.5% benefited from CT Scan, reporting complete lesion mapping. The lesions were cervical in 6.25% of patients, dorsal in 56.25%, and lumbar in 37.5% of cases.

The etiologies of spinal cord compression in our series were dominated by bone metastases secondary to prostate cancer, found in 50% of our cases (Table 1).

Table 1: Primary tumors causing spinal cord compression

Malignancy	Number of patients (%)
Prostate	8 (50)
Lung	3 (19)
Breast	3 (19)
Larynx	1 (6)
Colon	1 (6)

All patients received corticosteroid therapy. Radiotherapy was also indicated in 100% of the sample. 19% of the patients underwent surgery consisting of laminectomy with spinal stabilization (Table 2).

Table 2: Treatments provided to patients with MSCC

Treatment	Number of patients (%)
Corticosteroid therapy	16 (100)
Radiotherapy	16 (100)
Chemotherapy	8 (50)
Surgery	3 (19)

The evolution was marked by a complete or partial recovery in 62.5% of our patients.

DISCUSSION

MSCC is a relatively common complication of cancer, occurring in 5–10% of patients with malignancy, often complicating the end stages of the patient's illness. In 23% of patients, it can be the presenting manifestation of malignancy. It is viewed as a neurological emergency as a patient's mobility at the time of diagnosis is both a significant predictor of the ability to walk independently following treatment and is significantly associated with prognosis [3].

MSCC is not evenly distributed throughout the spine: 60–80% occur in the thoracic spine, 15–30% in the lumbosacral region, and fewer than 10% of MSCC involve the cervical spine. Up to 50% of patients have involvement in more than one area of the spine, which is proportional to the volume of bone in each spinal region [4].

Patients with established MSCC can present with a wide variety of neurological symptoms affecting any or all of the motor, sensory and autonomic nervous systems, often in the context of radicular back pain at the level of the compression. Classically, patients will have bilateral upper motor neuron findings below the level of the compression, although unilateral findings are frequently seen. A circumferential 'sensory level' below which sensation is reduced or altered may be noted, and bowel or bladder dysfunction (typically urinary retention) is often present. In a smaller proportion of patients, loss of balance may be the main presentation due to loss of proprioception (resulting from compression of the posterior cord) in the absence of any motor weakness [3].

Compression of the spinal cord by epidural tumor is detected by imaging, foremost MRI, preferably with the administration of gadolinium (Figure 1). MRI has been reported to be 100% sensitive in detecting spinal cord compression, except for compression in some ambulatory patients with minor motor deficits. Ideally, images of the entire spine should be obtained to ensure that additional lesions are not overlooked. When it is not possible to perform extensive imaging, the region corresponding to a sensory level or radiculopathy should be chosen. Tumor can be detected in many cases without the use of gadolinium, so MRI should not be withheld if the patient has a risk factor, such as allergy, for the administration of the agent. CT myelography is an alternative for patients who cannot undergo MRI. CT without myelography and radiography shows bony infiltration or vertebral collapse from the tumor but is not sensitive to detecting cord compression [5].

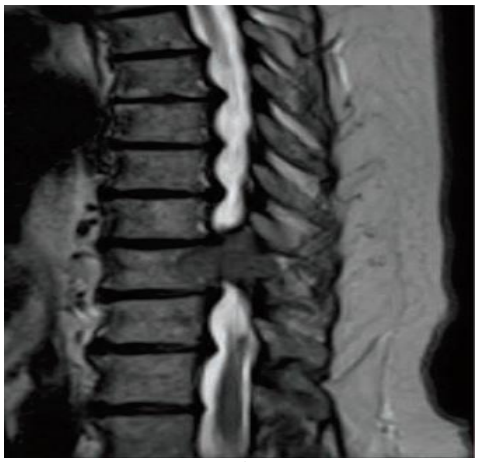

Figure 1: A parasagittal view of a T2-weighted MRI (Panel B) shows metastasis of renal cancer to the T10 vertebral body and pedicle, causing severe narrowing of the spinal canal [5]

Spinal cord compression can complicate nearly all types of malignancy but Lung, breast, and prostate cancers account for over 60% of MSCC cases, whereas 7% of patients have an unidentified site of the primary tumor [1, 6].

Treatment for MSCC occurs once the diagnosis is confirmed ideally with an MRI. Pre-treatment ambulatory status has consistently been shown to be the most important factor in determining treatment response. Treatment options include corticosteroids, surgical intervention, radiotherapy, bisphosphonate therapy, and chemotherapy. The aim of the implementation of steroids is the prevention of further neurological decline, preservation of spinal stability, and achievement of pain relief. In certain situations, steroids may directly decrease tumor size, which is the source of compression. Following initiation of high-dose steroids, patients are stratified for treatment with a combination of radiotherapy with or without surgery, depending on factors such as performance status, the extent of visceral and skeletal disease, inherent tumor radiosensitivity, treatment history, neurological status, and pain intensity. If there is uncertainty regarding spinal stability, surgical spinal stabilization should precede radiotherapy [1, 7-10].

CONCLUSION

MSCC can be a devastating diagnosis resulting in loss of independence in a patient's final months of life, however, in many cases, early identification can allow early treatment to prevent paraplegia and loss of bowel/ bladder function. It is, therefore, necessary to identify a high-risk population and to provide information to allow such high-risk patients to identify early symptoms of the condition. As with all medical conditions, close liaison and good communication between all the relevant teams are paramount to achieving the best functional outcome for patients.

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