Metastatic spinal-cord tumors: review of a hospital-based population

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Abstract

Metastases are the commonest extradural tumors leading to spinal-cord compression at multiple levels. This is a retrospective study of 209 patients admitted into our hospital (Neurology and Neurosurgery departments and outpatient clinic) from 1989 to June 1996 with metastatic spinal-cord tumors. Gender and age, neurologic presentation, neuroradiology findings, primary tumor origin, therapeutic approaches and outcome were evaluated in all patients.

Our main purpose with this review was to establish the most frequent clinical presentation that would enable a fast diagnosis and treatment with a favorable outcome.

Keywords: metastasis, therapy, outcome

Introduction

Considering that spinal cord primary tumors are relatively rare, most lesions at this level are of secondary type, i.e. easy, metastatic. It is estimated that around 5% of the total of neoplastic patients will present general lesions at extradural level, although not all of them have a clinical translation.[1-2] Such percentile value presents increasingly a growing trend, a trend that is directly proportional to the improvements on life expectancy from these patients.

The diagnosis of spinal-cord tumors and particularly the possible approaches and medical and/or surgical therapeutic combinations having gone through a considerable modification over the past decade. With the imaging resources we have available at present, it is increasingly important that such tumors are earlier detected, through the importance of signs and symptoms of neurologic characteristics, often presumed to be linked to a degenerative and/or rheumatoid pathology.

Objectives

A retrospective assessment of all clinical files of patients with spinal cord metastases, admitted in the Neurology and Neurosurgery services or followed up as outpatients, were assessed in the sense of getting to know the natural history (particularly earlier semiology), clinical evolution and global prognosis.

Based in an individual study protocol, it was sought to evaluate the distribution by age group and gender, the neurologic condition and the neuroimaging changes found in the spinal-cord CT scan, as well as the original neoplasm type and the time of latency elapsed since its diagnosis and the emergence of the spinal-cord metastatic lesion(s), the adopted therapeutic strategies and the survival rates (survival period, in months).

Material and methods

In the period elapsed from January 1989 to June 1996 (90 months), 209 patients with spinal-cord metastasis were selected. Also included in this study were multiple myeloma and lymphoma, and such inclusion was justified due to its importance and frequency on the daily clinical practice.

Results

A – Distribution by gender and age group

From the 209 assessed, 129 were from male patients (62%) and 80 of the female patients, with an average age of 60.8 years old (variation extremes: 18 – 87 years).

B – Neoplastic type

44 cases of multiple myeloma were found, 39 prostate neoplasm, 35 breasts neoplasm, 22

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Received for publication on the 20th July 1996

TABLE I

Primary neoplasms

1 – Multiple myeloma	44
2 – Prostate	39
3 – Breast	35
4 – Lung	22
5 – Gastrointestinal tract	20
6 – Lymphoma	12
7 – Thyroid	4
8 – Liver	3
9 – Kidney	3
10 – Ovary	3
11 – Melanoma	2
12 – Tongue	1
13 – Larynx	1
14 – Undetermined	20

lung neoplasm, 20 from the gastrointestinal tract, 12 lymphomas and 20 neoplasms which origin was never possible to ascertain (in spite of exhaustively searched). The reminder types of neoplasm are included on *Table I*.

It should be highlighted that in 110 patients (57%) there were metastasis in other organs, particularly at the liver and brain level, proving a diffuse widespread of the primitive tumor lesion.

Regarding the latency period elapsed from the diagnosis of the primitive tumor and the spinal cord tumor metastization, we caught very variable data and only possible of estimating 70% of cases (insufficient data in the reminder of the files); therefore, the average obtained was around 45 months, with extremes of variations so wide as the nine months for the prostate neoplasm and the six years for the breast neoplasms.

C – Clinical Condition

Most patients (117% cases; 56%) presented a neurological condition (*Table II*) made up of paraparesis (45%) or tetraparesis (11%) with sensitivity level to needles, associated to a painful condition (grinding pain, spontaneous and/or after local percussion); only in 32 of these cases the clinical condition had a sudden onset becoming a neurosurgical emergency. In the remaining 92 cases (44%), there was a clinical

TABLE II

Neurologic semiology

Paraparesis and pain	45%
Tetraparesis and pain	11%
Radiculopathy	44%

TABLE III

Number of lesions

Multiple – 141 patients (minimum of 3, maximum of 12)
Unique – 68 patients

condition associated to neurologic changes suggesting radiculopathy.

D – Neuro-imaging

All patients carried out at least one spinal-cord CT scan before and after therapy. Regarding the number of lesions they were preferentially multiple: in 141 patients (67%) it was seen at least three per patient (*Table III*).

Most lesions were of osteolytic kind (85% of cases), being featured by the multiple involvement of more than one segment of the spinal-cord (reaching both of the vertebral body and pedicle), almost exclusively of extramedullary type. In terms of location, the distribution was the represented on *Table IV*.

E – Therapy

- Medical: radiotherapy and/or chemotherapy
- Surgical

Medical therapy was implemented in all patients whether isolate or associated with surgery of lesions. Therefore from 209 patients, 108 had radiotherapy (49%), 79 chemotherapy (38%) and the reminder 22 chemotherapy plus radiotherapy (13%).

Also in terms of medication, it should be mentioned that most authors consulted[1-6] is favorable to corticotherapy by parenteral route (dexamethasone) as an anti-edema prevention on the metaplastic lesions of the spinal-cord, particularly in cases where there was a sudden onset of neurologic deficits, a practice also adopted in our patients undergoing an emergency neurosurgical intervention.

Regarding the surgical approach, three strategies

TABLE IV

Lesions distribution by segment

1 – Dorsal	101 patients (48.3%)
2 – Lumbar	41
3 – Dorsal-lumbar	24
4 – Lumbosacral	18
5 – Cervical	12
6 – Sacrococcygeal	8
7 – Cervical-dorsal	4
8 – Sacral	1

or adopted: 1 – decompressive surgery; 2 – resection surgery and 3 – lesion biopsy.

From the total of patients, only 99 (47%) were subject to a neurosurgical intervention. The tumoral decompressive surgery was carried out in 48 patients, with an emergency character in 32 cases (mostly associated to paraparesis or tetraparesis of sudden onset); to highlight that all patients were then subject to multiple sessions of radiotherapy. Tumoral resection surgery was performed in 23 patients; also in this group, the vast majority of patients underwent radiotherapy subsequently. The lesion biopsy, with diagnosis purposes, was carried out in 28 patients (have been conclusive in only 18 cases).

F – Prognosis

The survival rates, estimated in months, were determined only in the five types of most frequent primary neoplasms: multiple myeloma – 13 months; breast cancer - 12 months; prostate – 11 months; lung – five months; undetermined: four months.

Final comments

Assessing the results obtained, we think we can make the most frequent and paradigmatic profile of the patients with spinal-cord metastasis.

Patients in the sixth decade of life, if male most probably has developed a prostate or lung cancer or a multiple myeloma and, in the particular case of the female gender, with breast neoplasm in apparent remission of its primitive tumor lesion, presenting to the physician a neurologic condition featured initially by the onset of a grinding pain (of increasing intensity) to which it will be associated weeks or months later, a paraparesis (with level) and/or sphincters compromise. In some rarer cases, the motor deficit has a sudden onset, although almost always a thorough anamnesis will detect specific complaints (such as pains and/or functional impotence, staying antalgic positions), not fairly assessed or thought to be from another aetiology most likely already related with the spinal cord metastatic dissemination.

Spinal-cord CT scan will make evident lesions previously suggested by a simple radiologic study, i.e., multiple osteolytic lesions (although in some neoplasms, as the prostate, they can also be osteoblastic), involving several segments of the spinal-cord, but with a clear preference by the dorsal and/or dorsal-lumbar region, associated to signs of medullary compression.

To highlight in this profile, an extremely important and early symptom: the pain in the place of the lesion or around it and/or the radiculalgia suggesting compromise of the roots involved. Paraparesis with level will emerge almost always subsequently, leading to an immediate CT scan or a myelogram, to confirm diagnosis and discuss the better therapeutic approach. Regarding the latter, this is unfortunately in the vast majority of patients of the palliative kind, having as priority objective the resolution of the major neurologic deficits or the functional recovery, as well as the pain control. In advanced stages of the disease, the pain can be extremely incapacitating resisting therapy with non-steroidal anti-inflammatory and/or opioid drugs, leading to the placement of an epidural catheter to a better control of the pain.

The therapy choice should emerge from multidisciplinary consensus, and should be considered at all times the prognosis of the primitive tumor and the patient general condition. The vast majority of oncologic centers [1-7] chooses a decompressive surgery followed by radiotherapy. If we consider that radio therapy can deteriorated considerably the patient's neurologic condition, due to an intra- and peritumoral edema, the therapeutic sequence advised will be exactly this one: firstly surgery and only then radiotherapy. In our series, 48 patients (23%) were subject to a surgery of this kind, in association with radiotherapy schemes. In the bibliographical series consulted [1-7], radiotherapy improved considerably the neurologic deficits in around 45% of cases; and such results are even better in radiosensitive tumors as in Hodgkin and non-Hodgkin lymphomas and multiple myeloma, opposite of what happens with carcinomas

and melanoma. The isolated surgery (laminectomy more or less extensive, by anterior or posterior route) can only improve (partially) the patient in around 30% of cases. [1-7]

In general terms, there are six major indications justifying a neurosurgical intervention in the patient with spinal-cord metastasis: [1]

1 – Spinal-cord instability or medullary compression (due to bone fracture with the direct compression on neural structures); the choice for a decompressive surgery with a stabilization of the bone axis through a fusion;

2 – Failure responding to radiotherapy;

3 – Radio resistant tumor;

4 – Previous exposure of the spinal-cord to radiotherapy (in the case of the patient being already subject to multiple radiotherapy sessions and losing balance again, from a neurological point of view); decompressive surgery is the option;

5 – Unknown diagnosis: to perform a lesion biopsy;

6 – Recurrent local tumor associated to medullary compression in a patient already subject to high doses of radiotherapy.

In terms of prognosis the patient sees his/her chances of recovering of neurologic deficits in general and of walking independently in particular significantly compromised in the cases where the clinical condition has a sudden onset and progresses quickly. Regarding the kind of primitive tumor, the worst rates of survival are in our patients associated to neoplasms of undetermined origin many of which have already signs of diffuse dissemination at the time the neurologic condition is set. ■

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