Multiple Mieloma Metastases In Brain Parenchyma.

Metástase de Mieloma Múltiplo em Parênquima Cerebral.

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SUMÁRIO
O mieloma múltiplo em sistema nervoso central (SNC) é uma condição extremamente rara, sendo descrita em pouco mais de 100 casos na literatura. Neste artigo, os autores descrevem o caso de uma paciente do sexo feminino de 55 anos, submetida a transplante autólogo de medula óssea, e, mais tarde, à biopsia de tecido cerebral com confirmação imunohistoquímica, revelando tecido cerebral infiltrado por grande quantidade de plasmócitos, compatível com a história clínica de mieloma múltiplo. A paciente foi então submetida a radioterapia adjuvante em SNC, permanecendo em acompanhamento ambulatorial com a oncologia clínica e utilizando pamidronato dissódico mensal. Mesmo sendo uma afecção incurável, a radioterapia mostrou-se importante para o controle local.

Palavras-chave: mieloma múltiplo; plasmócitos; radioterapia; sistema nervoso central.

ABSTRACT
Multiple myeloma in the central nervous system (CNS) is an extremely rare condition, described in over 100 cases in the literature. In this article, the authors report the case of a 55-year-old female patient, subjected to an autologous bone marrow transplant, and, furthermore, to a brain tissue biopsy with immunohistochemistry confirmation, revealing infiltration by a great amount of plasma cells, compatible with the clinical history of multiple myeloma. The patient was then subjected to CNS adjuvant radiotherapy, with constant observation by clinical oncology and monthly pamidronate di-sodium prescription. Despite being an incurable pathology, radiation therapy showed important local control.

Keywords: multiple myeloma; plasma cells; radiation therapy; central nervous system.

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6. Participant: Medical School student.
INTRODUCTION

Multiple myeloma is a progressive and incurable neoplasia of the B cells, characterized by the unregulated and clonal proliferation of the bone marrow plasma cells, which produce and secrete monoclonal immunoglobulin (Ig) or its fragments, called protein M. Extramedullary involvement such as liver, skin, perineum, endocrine glandules, lymph nodes, digestive tract, nasopharynx, larynx, or superior respiratory tract is seen in less than 5% of patients. Central nervous system involvement is not common, being observed in 1% of multiple myeloma cases, as dural myeloma or intraparenchymal infiltration, or yet with diffuse leptomeningal involvement. The male/female rate is 1.4/1.0. The male/female rate is 1.4/1.0, being more common over 65 years of age. Nieuwenhuizen et al mention 109 cases of CNS multiple myeloma reported in the literature.

CASE REPORT

A fifty-five years-old female patient was evaluated at Erasto Gaertner Hospital (HEG) in December 2009 with a history of multiple myeloma and thoracic tomography (CT) in June 2009 indicating fracture in the T10 thoracic spine, with signs of spinal cord compression. At admission she mentioned that, for six months, she had been having pain in a left arm, for 30 days with paresthesias in both legs and for one week with weakness of inferior limbs. In December 2009, she was started on VAD scheme (vincristine, doxorubicin, dexamethasone) chemotherapy for 5 days. Soon after, she was evaluated by radiotherapy, orthopedics and neurology services at HEG. In February 2010 she was subjected to an spinal arthrodesis and fixation of vertebrae T7-L1. Biopsy material revealed bone marrow infiltration of plasmacytic cells, compatible with multiple myeloma.

In May 2010 she underwent new chemotherapy with a VAD regimen for 5 days. In July, bone marrow cells were collected for autologous transplantation (TAMO), which was done a month later. In October she was hospitalized for sudden headache: CT showed multiple lesions compatible to myeloma. She was also subjected to brain magnetic resonance (MRI), which showed a cortico-subcortical left paramedian solid nodular occipital lesion, measuring approximately 25 x 20 mm, and multiple ill-defined spots in the supratentorial white matter with asymmetrical distribution. The patient was subjected to cranietomy with tumor resection with the following histological diagnosis: extensively necrotic brain tissue with a great amount of plasma cells, compatible with myeloma. Immunohistochemical study is presented as follows (Table 1).

Pathology reported that the brain tissue in question was infiltrated by a great amount of plasma cells, compatible with the clinical history of multiple myeloma. CNS adjuvant radiotherapy 2D with a total dosage of 37.5 Gy (15 fractions of 250cGy) was then performed. She is currently under follow-up as an outpatient.

DISCUSSION

Multiple myeloma (MM) is a progressive and incurable neoplasia of the B cells, representing 10% of hematological tumors and only 1% of all the malignant neoplasia. CNS involvement is not common, being observed in less than 1% of cases of patients with MM. Other extra involvement sites such as liver, skin, perineum, endocrine glandules, lymph nodes, digestive tract, nasopharynx, larynx, or superior respiratory tract is observed in less than 5% of the patients.

Although considered incurable, MM treatment has advanced with the introduction of drugs like thalidomide, lenadomide and bortezomib. New parameters of prognosis have been proposed with the combination of β2 microglobulin and serum albumin, resulting in a system of simple and reliable staging called International Staging System, described in table 2.

Table 1 - Immunohistochemical Panel

<table>
<thead>
<tr>
<th>Marker</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 138</td>
<td>Positive In The Plasma Cells</td>
</tr>
<tr>
<td>CD 20</td>
<td>Negative</td>
</tr>
<tr>
<td>CD 3</td>
<td>Positive In The T Lymphocytes</td>
</tr>
<tr>
<td>KI 67</td>
<td>Positive In 20% Of The Plasma Cell Core</td>
</tr>
</tbody>
</table>

Table 2 - International Staging System

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>β2 microglobulin</td>
<td>High</td>
</tr>
<tr>
<td>Serum albumin</td>
<td>Low</td>
</tr>
</tbody>
</table>

Pathology reported that the brain tissue in question was infiltrated by a great amount of plasma cells, compatible with the clinical history of multiple myeloma. CNS adjuvant radiotherapy 2D with a total dosage of 37.5 Gy (15 fractions of 250cGy) was then performed. She is currently under follow-up as an outpatient.
Table 2 - International Staging System for multiple myeloma

<table>
<thead>
<tr>
<th>Stage</th>
<th>Durie-Salmon system(^a)</th>
<th>International Staging System</th>
</tr>
</thead>
</table>
| I     | All of the following:       | Serum \(\beta_2\)-microglobulin level < 3.5 mg/L  
|       | • Hemoglobin level > 10 mg/dL | Serum albumin level > 3.5 g/dL  
|       | • Serum calcium level normal or 12 mg/dL |  
|       | • On x-ray, normal bone structure (scale 0) or solitary bone plasmacytoma only |  
|       | • Low M-component production rates: |  
|       |   Immunoglobulin (Ig) - G value < 5 g/dL |  
|       |   IgA value < 3 g/dL |  
|       |   Bence-Jones protein level < 4 g/24 h |  
| II    | Fitting neither stage I nor stage III | Not stage I or II\(^b\)  
| III   | One or more of the following: | Serum \(\beta_2\)-microglobulin level > 5.5 mg/L  
|       | • Hemoglobin level < 8.5 mg/dL |  
|       | • Serum calcium level > 12 mg/dL |  
|       | • Advanced lytic bone lesions (scale 3) |  
|       | • High M-component production rates: |  
|       |   IgG value > 7 g/dL |  
|       |   IgA value > 5 g/dL |  
|       |   Bence-Jones protein level > 12 g/24h |  

\(^a\)Subclassification: A = relatively normal renal function (serum creatinine (Scr) value < 2.0 mg/dL); B = abnormal renal function (Scr > 2.0 mg/dL)  
\(^b\)For stage II, there are two categories: serum \(\beta_2\)-microglobulin level < 3.5 mg/L, but serum albumin level < 3.5 mg/dL; or serum \(\beta_2\)-microglobulin level of 3.5 to < 5.5 mg/L, irrespective of the serum albumin level.  
Ig = immunoglobulin  

### Final Considerations

Due to the little information about the ideal treatment, the team preferred to use adjuvance with radiotherapy, considering the necessity of local control, aiming to impede or minimize the chance of CNS recurrence. During the treatment, the patient didn’t complain about any adverse reaction to radiotherapy, evolving in a satisfactory way and is currently being followed-up at the HEG Clinical Oncology, under monthly pamidronate disodium.

### Consent

The Hospital Research Ethics Committee approved this project.

### References


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