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Multiple Myeloma in a 27-Year-Old Female Presenting with Recurrent Low Back Pain

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ABSTRACT

Multiple Myeloma or Kahler's disease is a neoplasm characterized by proliferation of plasma cells in bone marrow where the most common clinical manifestations include bone pain secondary to osteolysis, kidney damage and hypercalcemia. The most common risk factors associated with this pathology are advanced age, family history of multiple myeloma, alcoholism, smoking, among others. Diagnosis includes the presence of monoclonal protein or paraprotein in serum and urine by electrophoresis, presence of free chain protein in 24-hour urine and immunofixation in serum. We present a clinical case of a 27-year-old female patient who presented lumbar pain as the initial manifestation and on requesting laboratory tests showed alterations compatible with myeloma. Laboratory studies were requested confirming the diagnosis of Multiple Myeloma kappa stage ISS-III in current treatment with cyclophosphamide, dexamethasone and thalidomide.

KEYWORDS: Multiple myeloma, paraprotein, electrophoresis, immunofixation, young patient

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INTRODUCTION

Multiple myeloma (MM) is a malignant plasma cell neoplasm characterized by a clonal proliferation of malignant cells in the bone marrow (1). A worldwide incidence close to 1% has been reported, with higher peaks in North America, Australia, New Zealand and Central Europe (2); however, an epidemiological study of incidence, mortality and trend conducted in 2017 in 17 Latin American countries in a period between 1990-2007, in an age range of 40 years and older, revealed an increase in the incidence pattern in eight countries, including Mexico in the female population (3). The average age of onset is around 60 years, with patients under 40 years of age accounting for only 2% of multiple myeloma cases (4). The most common clinical manifestations include anemia, bone pain secondary to osteolysis, elevated serum creatinine levels, generalized weakness and hypercalcemia (4,5). In a 2015 meta-analysis study conducted a search of articles related to risk factors for Multiple Myeloma (MM) where 22 articles were considered for its realization, they found as risk factors advanced age, positive family history for multiple myeloma, drug addictions such as smoking and alcoholism, race of African descent, as well as occupational associations such as practicing agriculture, being a firefighter, hairdresser or even exposure to chemicals and pesticides, such as methylene chloride (6). Diagnosis includes the presence of IgG-type monoclonal protein in serum (less frequently IgA, IgD and IgM respectively) and urine by electrophoresis, presence of free light chain proteins in 24-hour urine, immunofixation in serum. In addition, it is complemented with blood cytometry, serum creatinine and bone marrow aspirate examination. Occasionally it is necessary to request laboratory studies such as computed tomography or radiographs when osteolytic lesions are suspected (7). The International Staging System (ISS) is currently the most widely used tool to evaluate prognosis in both young and older patients, based on two variables: serum albumin and B2-microglobulin (8). For treatment there are different guidelines according to the situation or phase of the disease, such as initial therapy, maintenance therapy, rescue therapy in relapses and, if available, stem cell transplantation; among the drugs used, thalidomide proved to have the highest survival rates; however, alternatives are still being studied in order to cause the least possible hematological toxicity (9). In a univariate study conducted in 2015, it was found that high

stage ISS, primary leukemia, male sex, hemoglobin < 10, thrombocytopenia <150,000/ml, serum albumin < 3.5 g/dL, serum creatinine > or equal to 2 mg/dL, LDH > or equal to 250 U/l, serum B2- microflobulin > 5500 mg/l were found to be significant predictors of Early Mortality in Multiple Myeloma (10).

CLINICAL CASE PRESENTATION

Female patient aged 27 years, height 1.56 m and weight 49 kg. As important family history, maternal grandmother died of endometrial cancer. She denies drug addictions and chronic degenerative diseases. Patient who began her current condition 2 months prior to her hospitalization with clinical symptoms of high intensity, stress-related, stabbing low back pain, for which she went for medical evaluation on multiple occasions to the emergency department where she was administered analgesics and was discharged with non-steroidal anti-inflammatory drugs with partial improvement of the symptoms, however, without achieving remission of the same. Two weeks prior to her last hospitalization she presented exacerbation of lumbar pain that evolved into gait claudication, for which reason she was referred to the outpatient rheumatology department where sulfasalazine and prednisone were prescribed for suspicion of ankylosing spondylitis and a human leukocyte antigen B-27 (HLA-B27) test was requested, with no improvement in her symptoms.

She went to the emergency room due to increased pain in the lumbar region, general laboratory studies were performed, blood biometry, blood chemistry and serum electrolytes, where grade II anemia according to WHO normocytic normochromic type with an Hb 8.6 g/dL, increase in serum creatinine of 1.7 mg/dL, as well as the only electrolyte alteration hypercalcemia with a serum calcium corrected with albumin of 12 mg/dL. She was admitted to the hospitalization service in charge of Rheumatology with a presumptive diagnosis of "bone pain under study".Consultation with the Internal Medicine Department was requested, where a diagnostic approach of bone pain was made, correlating with paraclinical studies, initiating suspicion of Multiple Myeloma diagnosis. A bone series was requested as an initial study, where the presence of bone alterations in the anteroposterior skull radiograph (Figure 1) was not concretely visualized, however, osteolytic lesions can be observed in the lateral skull radiograph, areas of radiopacity of round appearance can be observed at the level of the parietal area extending towards the frontal region (Figure 2).

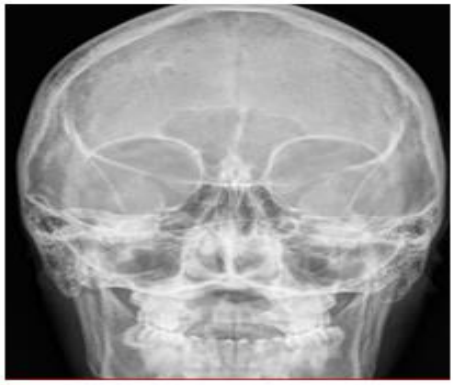

Figure 1.

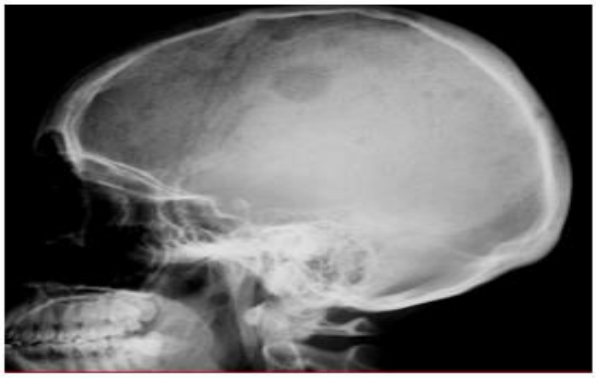

Figure 2.

Figure 1 and 2. Anteroposterior and lateral skull radiograph with osteolytic lesions in "punched out".

After the imaging studies were performed, a bone marrow aspirate and biopsy study was requested, where hypercellular marrow was observed, megakaryopoietic system preserved without morphological alterations, granulopoietic system with presence of all the mature series, calling attention to the infiltration of 30% of plasma cells, some of them binucleated and trinucleated.

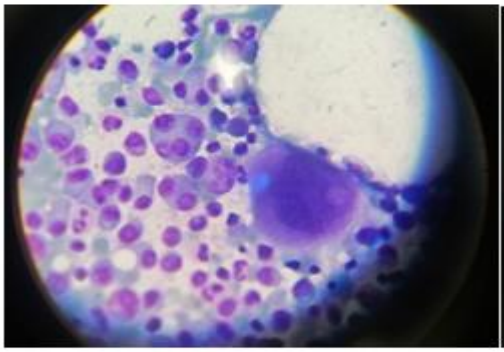

Figure 3.

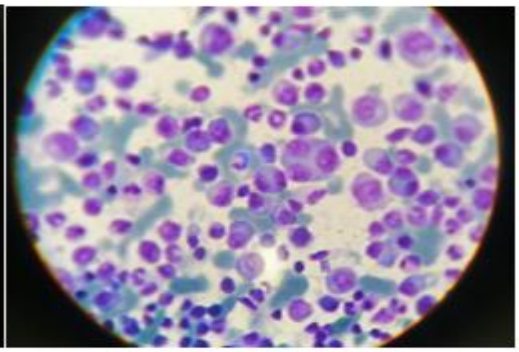

Figure 4.

Figure 3 and 4. Bone marrow aspirate showing hypercellularity of plasma cells.

As a confirmatory study for the diagnosis of Multiple Myeloma (MM), serum beta-2-microglobulin levels are requested, with an increase greater than three times its upper reference value, serum protein immunofixation study with a positive kappa-type monoclonal band run 740 mg/dl. Kappa/Lambda light chains in 24-hour urine. Kappa positive 20.3 mg/dl. Paraclinical examination by electrophoresis was performed with IgG with higher levels of paraprotein 6,230 mg/dL (840-1,600), with IgA and IgM within normal reference ranges.

The diagnosis of multiple myeloma kappa is established. Stage ISS III. After evaluation by the hematology service, she received treatment based on cyclophosphamide, dexamethasone and thalidomide, which continues to be her current treatment. The patient presented clinical improvement after the beginning of her treatment, she remains in recurrent evaluations by external consultation in charge of Hematology.

Inmunofijación de Proteínas en Suero

Método : Contrainmunoelectroforesis

Corrimiento de banda Monoclonal: DE TIPO KAPPA:	SI SE DETECTO* 740* mg/dL	NO SE DETECTO 170 - 370
Corrimiento de bandas Oligoclonales:	NO SE DETECTARON	NO SE DETECTARON
Corrimiento de bandas Policlonales:	NO SE DETECTARON	NO SE DETECTARON

Observaciones Generales :

* RESULTADO VERIFICADO

Figure 5. Immunofixation of proteins in serum with kappa-type monoclonal band shift.

DISCUSSION

The reason for reporting this case is due to the atypical presentation in terms of age reported for the onset of suspicion in the literature reviews both nationally and internationally. It is important to note that the patient had previously sought medical attention and was sent to the rheumatology service with a probable diagnosis of ankylosing spondylitis; however, when laboratory studies were performed to confirm the diagnosis, she presented negative values of negative human leukocyte antigen B-27; despite this, the patient was treated with nonsteroidal anti-inflammatory analgesics, without showing any improvement. After being admitted to the Rheumatology service, a diagnostic approach was requested by Internal Medicine, where after finding paraclinical findings of anemia, elevated creatinine and hypercalcemia, the diagnostic possibility of Multiple Myeloma was suspected, For this reason a metastatic bone series was initially requested, where the presence of osteolytic lesions in "punching bag" was observed, predominantly in the skull, lateral radiography, this finding together with serum hypercalcemia suggests bone destruction. After clinical and paraclinical correlation, confirmatory and complementary studies were performed.

A bone marrow biopsy was performed, where 30% of plasma cell infiltration was reported; confirmatory studies were requested with electrophoresis, immunofixation and light chains, which confirmed the diagnosis and determined the staging of the disease according to the International Staging System for Multiple Myeloma, having at the end of the case an ISS-3 staging (large cell mass).

The importance of the clinical case lies fundamentally in the fact that, in spite of presenting classic symptoms for Multiple Myeloma, the age at which this entity is usually associated is in a population older than 40 years, making this clinical case an important epidemiological exception, and prospectively, to contemplate a comprehensive analysis of patients outside the age groups considered in the literature, as well as to encourage the expansion of case studies particularly in search of new risk factors associated with the entity.

CONCLUSIONS

We present a case report of a 27-year-old patient with a diagnosis of Multiple Myeloma; the average age of onset of this entity is around 60 years of age and its presentation in patients under 40 years of age is very rare due to epidemiology. The initial approach by age group was in follow-up by the rheumatology service, however, upon requesting laboratory studies the acronym CRAB (for its acronym in English described as "crab") is evidenced according to each letter calcemia, renal lesion, anemia and bone pain (from "bone" meaning bone) of Multiple Myeloma, arriving with this approach to the definitive diagnosis.

In this article any conflict of interest is denied, the patient gave consent for the publication of this clinical case, as well as the authors indicate to be responsible for the veracity of the information that is asserted in this manuscript.

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