

# Multiple Myeloma, A Patient with Multiple Infections: A Case Report

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## Abstract

We report a case of a 63-year-old male with recurrent severe respiratory infections during the last year. During the last 6 months, he presented with a gradual onset of generalized weakness, fatigue, myalgia and anorexia. He self-medicated with intramuscular analgesics developing abscess of the left gluteal area. Throughout his hospitalization, anemia and kidney failure were found without apparent cause. Wide antibiotic coverage was used without signs of improvement. The patient was transferred to the University Hospital, where under the criteria of recurrent infections, normocytic anemia, and kidney failure; metastatic series imaging is sent. The finding of lytic punched out lesions in the skull X ray suggested multiple myeloma. Multiple Myeloma represents pathology of diverse distribution. Although, the incidence is not reported in Honduras, we consider it an underdiagnosed pathology often missed because it is not considered by clinicians.

**Keywords:** Multiple Myeloma; Plasma cells;  $\beta$ 2 microglobulin

## Introduction

Multiple myeloma (MM) is a plasma cell disorder characterized by clonal proliferation of malignant plasma cells in bone marrow. This can be detected by monoclonal protein in the blood or urine, and dysfunction of associated organs. It is classified as asymptomatic or symptomatic depending on the absence or presence of an organ lesion or dysfunction of the affected organ tissue. Its presentation may vary, which makes the diagnosis harder; especially in early stages where the patient has better prognosis [1-3]. The MM represents 1% of neoplastic diseases and 13% of hematologic cancers [1,3,4]. In Western countries, the adjusted annual age incidence is 5.6 cases per 100,000 people. The average diagnosis age is around 70: 37% of patients are under age 65, 26% are between the ages of 65 and 74, and 37% are 75 years of age or older [1]. The risk of infection in patients with MM increases mainly due

to polyclonal hypogammaglobulinemia [4], but there are also other reasons such as: reduction of CD4 + T cells, functional impairment of the natural killer cells, abnormalities in the complement system, and occasional granulopenia [5] which constitutes the leading cause of mortality in these patients. The risk of infection exceeds 7-15 times that of a hospitalized patient for any other reason [4,5]. The diagnosis of multiple myeloma is based on the presence of at least 10% plasma cells in the bone marrow sample and the presence of monoclonal protein in serum or urine. In patients with Nonsecretory myeloma, the diagnosis is based on the presence of 30% plasma cells or evidence of plasmacytoma in the bone marrow [3].

## Case Presentation

A 63-years-old male, farmer presents with history of six months of generalized musculoskeletal pain that has gradually increased. He has been treated with oral and intramuscular analgesics without improvements. He also reports an onset of weakness, myalgia, anorexia, and a presence of abscess in left gluteal area. The patient is hospitalized in a Regional Hospital where he receives antibiotic coverage for seven days with no improvements. The musculoskeletal pain persists and limits ambulation, for this reason, he is transferred to the University Hospital.

## Past medical history

Hypertension for over a year; currently managed with atenolol, 100 mg a day. Two months ago, history of a stroke without neurologic damage or motor deficit. Pneumonia in two occasions that required antibiotic coverage and hospitalization for more than 21 days.

## At hospitalization it presents vital signs

Heart Rate: regular 71 bpm, Respiratory Rate: 18 rpm, Temperature: 37°C, O2 Sat: 98%, Weight: 80 Kg, Height: 5 feet and 7 inches. At physical examination we find a male alert and oriented, cooperative. Poorly nourished with pale and thin skin, with facies of chronic disease and overall clinical deterioration. His gait is slow, with ambulation difficulty due to musculoskeletal pain. The left gluteal area presents an abscess

in resorption with scarce purulent material. The rest of the physical examination is normal.

### Laboratory findings

**Kidney ultrasound findings:** The Right kidney measures 121 mm × 64.8 mm. The left kidney measures 118 mm × 68 mm.

Kidney parenchyma is normal and corticomedullary relation is normal. Evidence of moderate urinary stasis at the pyelocaliceal region of the left kidney with lithiasis of 7 mm. Bladder without abnormalities (**Table 1**).

**Table 1** Kidney ultrasound findings.

Complete blood count		Blood chemistry		Immunologic
Hg	10.1 g/dl	Glucose	143 mg/dl	<b>Protein Immunofluorescence</b> Albumin: 26.9% (55-66) Alpha1: 5.7% (2.9-4.9) Alpha2: 11.5% (7.1-11.8) Beta1: 3.4% (4.7-7.2) Beta2: 3.7% (3.2-6.5) Gamma: 48.8% (11.1-18.8)
Hct	32.1%	BUN	12 mg/dl	
MCV	82 fl	Creatinine	2.7 mg/dl	
MCH	27.3 pg	AST	30 U/L	
Platelets	229,000 ul	ALT	33 U/L	
Leukocytes	5730 ul	Sodium	144 meq/L	
Neutrophils	4140 ul	Potassium	3.9 meq/L	
Lymphocytes	1290 ul	LDH	297 u/L	<b>Immunoglobulins</b> IgG: 6948 mg/dl IgE: 22.41 u/ml IgM: 16.8 mg/ml IgA: 18.3 mg/dl
		Albumin	1.5 g/dl	
		Calcium	8.5 mg/dl,	
		Uric Acid	8.9 g/dl	
				<b>β2 microglobulin:</b> 8.82 g/dl

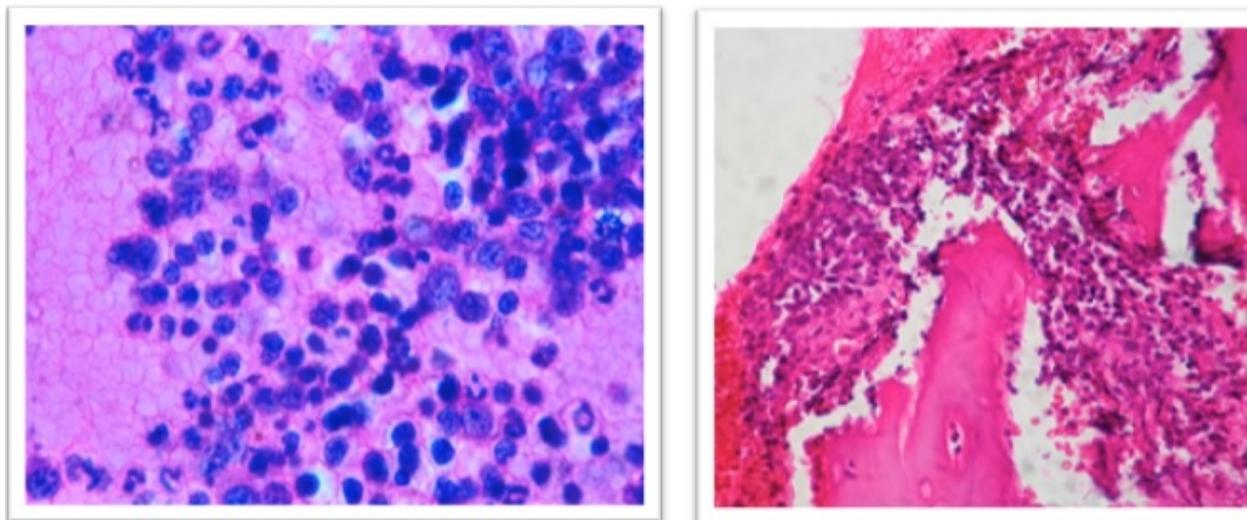
**Bone survey:** Lateral x-ray of the skull: Multiple well circumscribed lytic lesions with a diameter between 0.5 cm to 2.5 cm. The rest of the study was without abnormalities.

**Bacterial culture of abscess:** Positive to *Acinetobacter baumannii* sensitive to imipenem and tigecycline (**Figure 1**).

**Bence-Jones protein:** Negative

**Urine analysis:** Presence of high concentration of calcium oxalate crystals.

**Bone marrow biopsy:** Plasma cell infiltration of more than 10%.



**Figure 1** Bone marrow biopsy: Plasma cell infiltration of more than 10%.

## Discussion

Multiple Myeloma is characterized by a clonal proliferation in the bone marrow that causes a marked hypogammaglobulinemia; which is the main reason for the development of severe infections in immunocompetent patients.

Severe episodes of infections falling between 0.8% to 2.2% of the total Multiple Myeloma diagnosis every year are described as being the leading cause of death in these patients. These cases are most often associated with bacterial infections of the lung and the urinary tract. Nonetheless, there are also reports of viral and fungal infections [5].

The physical examination in these patients is usually normal, with the exception of patients with clonal proliferation in the adjacent bone. This clonal proliferation causes destruction of bone, bone fractures, and pain. Other important features that may occur include: anemia, hypercalcemia, renal failure, susceptibility to infection, coagulation problems, neurologic symptoms, and vascular problems due to hyperviscosity.

Reviewing our case, we have a patient with generalized musculoskeletal pain who develops a gluteal abscess from intramuscular analgesics self-medicated and presents a past medical history in the last year of two episodes of Pneumonia that required hospitalization. However, after adequate management, abscess drainage, and broad antibiotic therapy; the patient symptoms did not improve. The patient therefore, is re-evaluated and transferred to the University hospital in the capital city. Upon arrival, the patient presented with difficulty in ambulation due to generalized pain and marked deterioration of his overall condition.

The latest criteria to diagnose symptomatic Multiple Myeloma requires the presence of organ or tissue damage related to the proliferating tumor defined by the presence of at least one of seven possible manifestations [5]:

- Anemia with a decrease in hemoglobin of at least 2g/dl compared to the normal value, or a hemoglobin below 10g/dl.
- Hypercalcemia greater than 10 mg / l (0.25 mmol/l) above normal or an absolute number greater than 110 mg / dl (2.75 mmol/l) of serum calcium.
- Osteolytic lesions, osteoporosis, or compression fractures with no attributable cause.
- Renal Failure, with creatinine of more than 2 mg/dl or 173 mmol/l
- Symptomatic Hyperviscosity;
- Amyloidosis

Recurrent bacterial infections (>2 severe episodes that required hospitalization over a period of 12 months). The presence of these abnormalities is important because without organ lesion, the asymptomatic forms of Multiple Myeloma will not require treatment; only proper monitoring.

To state prognosis and decide proper management the international system of stratification is used. This stratification

system divides Multiple Myeloma in three stages according to the level of serum protein and  $\beta 2$  level [1,6,7].

- Step I: serum  $\beta 2$  - microglobulin <3.5 mg/liter, serum albumin  $\geq 3.5$  g/dL
- Step II: serum  $\beta 2$  - microglobulin, <3.5 mg/liter, plus serum albumin <3.5 g/dl; or
- $\beta 2$  microglobulin of 3.5 to <5.5 mg/l, irrespective of serum level of serum albumin
- Stage III: serum  $\beta 2$  - microglobulin  $\geq 5.5$  mg/liter

The laboratory data findings in the patient where: Normochromic normocytic anemia, acute renal failure, and hypoalbuminemia.

The increase in beta-2-microglobulin is indicative of high tumor burden and renal failure is one of the main predictors of the disease [5]. Currently, the median survival does not exceed four years with conventional chemotherapy [4,7].

Our case was classified as Multiple Myeloma Stage III due to the levels of  $\beta 2$  – microglobulin greater than 5.5 mg/liter. The first-line therapy is induction therapy, followed by high dose therapy and autologous hematopoietic stem cell transplant [4]. Our patient was not a candidate for first-line therapy due to his age and his tumor stage. Age is an important marker not only for survival, but also for chemotherapy tolerance [8].

It is estimated that a patient under 65 in stage II has a survival of 50 months, while for patients older than 65 years at a similar stage have a survival rate of only 37 months [4]. New drugs, such as bortezomib, thalidomide or lenalidomide, in combination with traditional chemotherapy are the treatment of choice in this group of patients [4,5,9]. The use of these drugs has significantly improved the complete remission rate and the overall survival in these patients [9]. Induction in these patients should be based on classical treatment schemes, such as mepfalan or high doses of dexamethasone combined with one of the new drugs as thalidomide or bortezomib [5,10]. We used this therapy for our patient with very good response and tolerance. A high dose of 40 mg of dexamethasone plus 100 mg of thalidomide was prescribed daily during the first month. Due to the good response to the initial therapy, the dose of thalidomide was increased to 100 mg twice a day during the second month. The patient currently continues to be monitored in the outpatient clinic of hematology.

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