Cross Current International Journal of Medical and Biosciences
Abbreviated Key Title: Cross Current Int J Med Biosci
ISSN: 2663-2446 (Print) & Open Access
DOI: https://doi.org/10.36344/ccijmb.2025.v07i01.001

Volume-7 | Issue-1 | Jan-Feb, 2025 |

Case Report

Multiple Myeloma in a Young Patient Revealed by Lumbosciatica: A Case Report

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| **Received:** 13.11.2024 | **Accepted:** 18.12.2024 | **Published:** 15.01.2025 |

Abstract: Multiple myeloma, a malignant hematologic disorder characterized by excessive monoclonal plasma cell proliferation in the bone marrow, is rare in individuals under 40, comprising less than 2% of cases. This report details a 27-year-old patient with left-sided lumbosciatica and clinical signs of lumbar and radicular syndrome at the S1 level. Imaging revealed multiple osteolytic lesions with perilesional sclerosis and abnormalities in the first sacral foramen. Biological findings included normochromic normocytic anemia, hypercalcemia, elevated sedimentation rate, monoclonal IgG Kappa, free Kappa light chains, hyperproteinemia, and hypoalbuminemia. A bone marrow biopsy confirmed 95% plasma cell infiltration. The patient underwent a VRD regimen and three cycles of D-VRD and is awaiting autologous stem cell transplantation. This case underscores the need to consider multiple myeloma in young patients, as failure to do so could delay critical diagnosis and treatment.

Keywords: Young Patients, Multiple Myeloma, Osteolysis, Blood Smear, Bone Marrow.

INTRODUCTION

Multiple myeloma, also known as Kahler's disease, is a malignant hematologic disorder resulting from the excessive proliferation of monoclonal plasma cells in the bone marrow. These abnormal plasma cells produce a monoclonal immunoglobulin or a fragment of it (free light chain), detectable in the blood and/or urine.

Multiple myeloma primarily affects older adults, with an average age at diagnosis of 70 years. The incidence of this disorder rises progressively with age, regardless of gender or race, and it is rarely observed before the age of 40 (less than 2% of cases) [1].

Patients often experience bone-related symptoms, including pain and pathological fractures, as these tend to be prominent in multiple myeloma. Diagnosis is typically straightforward, involving a combination of excessive plasma cells in the bone marrow and monoclonal immunoglobulins in the serum or urine. The main factors influencing prognosis are serum β2-microglobulin levels and specific cytogenetic abnormalities in malignant plasma cells, particularly translocation (p16; q32), t(4;14) and deletion (17p).

We report the case of a 27 year-old patient who was diagnosed with multiple myeloma, revealed by lumbosciatica that was resistant to treatment.

CASE PRESENTATION

A 27 year-old patient with no notable medical history, admitted for left-sided lumbosciatica. The condition began 3 months earlier with the onset of S1-type lumbosciatica. The patient did not report any limb heaviness or genitourinary disturbances, and the condition developed in a context of afebrility and preserved general health. Neurologically, the patient could walk unaided, muscle strength was preserved at 5/5 in all four limbs, and deep tendon reflexes were present and symmetrical. The clinical examination of the spine revealed lumbar and radicular syndrome at the S1 level with pain upon mobilization of the left hip. Additionally, there were no signs of lymphadenopathy or hepatosplenomegaly.

A thoracoabdominopelvic CT scan revealed multiple infra-centimetric osteolytic lesions in the axial skeleton and girdles, along with a geographic lesion in the left hemipelvis involving the first sacral foramen (Figure 1a).

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Citation: Mariam Hachimi Idrissi, Khadija Essahli, Soufiane Benaazza, Qamar Zaza, Hafid Zahid (2025). Multiple Myeloma in a Young Patient Revealed by Lumbosciatica: A Case Report. *Cross Current Int J Med Biosci, 7*(1), 1-4.

MRI showed a signal abnormality in the left wing of the sacrum with a geographic pattern and perilesional sclerosis, showing intermediate T1 signal, T2 hyperintensity, and enhancement after Gadolinium injection. This lesion involves the first sacral foramen (Figure 1b, 1c and 1d).

The blood count revealed leukocytosis at 11,900/mm³, predominantly neutrophilic, with normochromic normocytic non-regenerative anemia (Hb at 8.3 g/dl, MCV at 82 fl, MCHC at 27.4 pg, and reticulocyte count at 47,000/mm³). Due to the thrombocytopenia (platelet count at 96,000/mm³), a blood smear was performed, showing 16% myelocytes, numerous red blood cells in rolls, and the absence of platelet aggregates, atypical cells, or plasma cells (Figure 2a).

The erythrocyte sedimentation rate was elevated at 110 mm in the first hour. The biochemical workup revealed normal renal function, corrected hypercalcemia at 110 mg/L, hypoalbuminemia at 20 g/L, normal liver function tests, a C-reactive protein level of 8.7 mg/L, and negative 24-hour proteinuria at 0.44 g/L. Multiple myeloma was suspected based on the results of the tests, including non-regenerative normochromic normocytic anemia, hypercalcemia, an erythrocyte sedimentation rate of 110 mm in the first hour, and osteolytic lesions, prompting the need for serum protein electrophoresis (SPE) and a myelogram.

The SPE revealed the presence of a monoclonal immunoglobulin of the IgG Kappa isotype associated with monoclonal free light chains of the Kappa isotype, as well as hyperproteinemia at 154 g/L, associated with hypoalbuminemia and the presence of a monoclonal spike migrating in the gamma globulin zone, measured at 89.3 g/L.

The free Kappa light chains were at 29.96 mg/L, while the free Lambda light chains were at 12.20 mg/L, with a Kappa/Lambda free light chain ratio of 2.46. The myelogram revealed an amegakaryocytic bone marrow infiltrated by 95% dystrophic small plasma cells (Figure 2b),

This corresponds to a stage IIIA multiple myeloma according to the Salmon and Durie classification. Molecular cytogenetic analysis revealed a translocation abnormality of type t (11;14).

The patient was started on a VRd (bortezomib, lenalidomide, and dexamethasone) regimen followed by three cycles of D-VRd (daratumumab plus VRd) and is currently awaiting autologous hematopoietic stem cell transplantation.

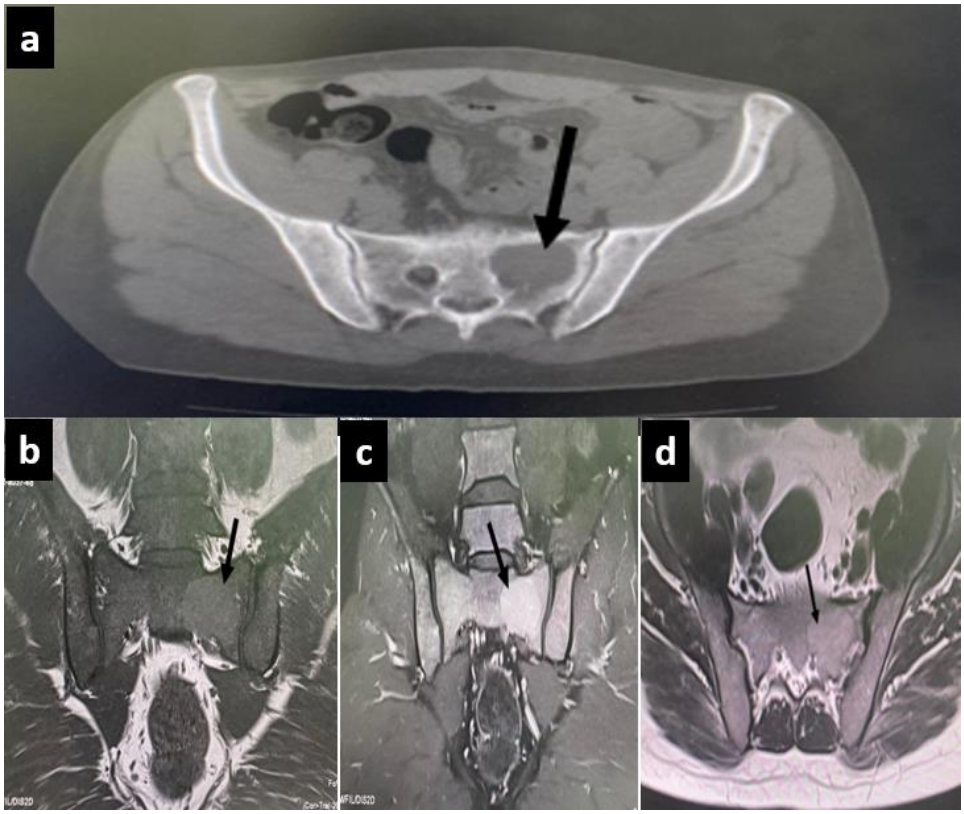

Figure 1(a): Abdominopelvic CT scan showing a geographic lytic lesion in the left hemipelvis involving the first sacral foramen. (Arrow)

Figure 1(b, c and d): Pelvic MRI showing a geographic signal abnormality in the left wing of the sacrum with perilesional sclerosis, intermediate T1 signal (b), T2 hyperintensity (d), and enhancement after Gadolinium injection (c). This lesion involves the first sacral foramen. (Arrow)

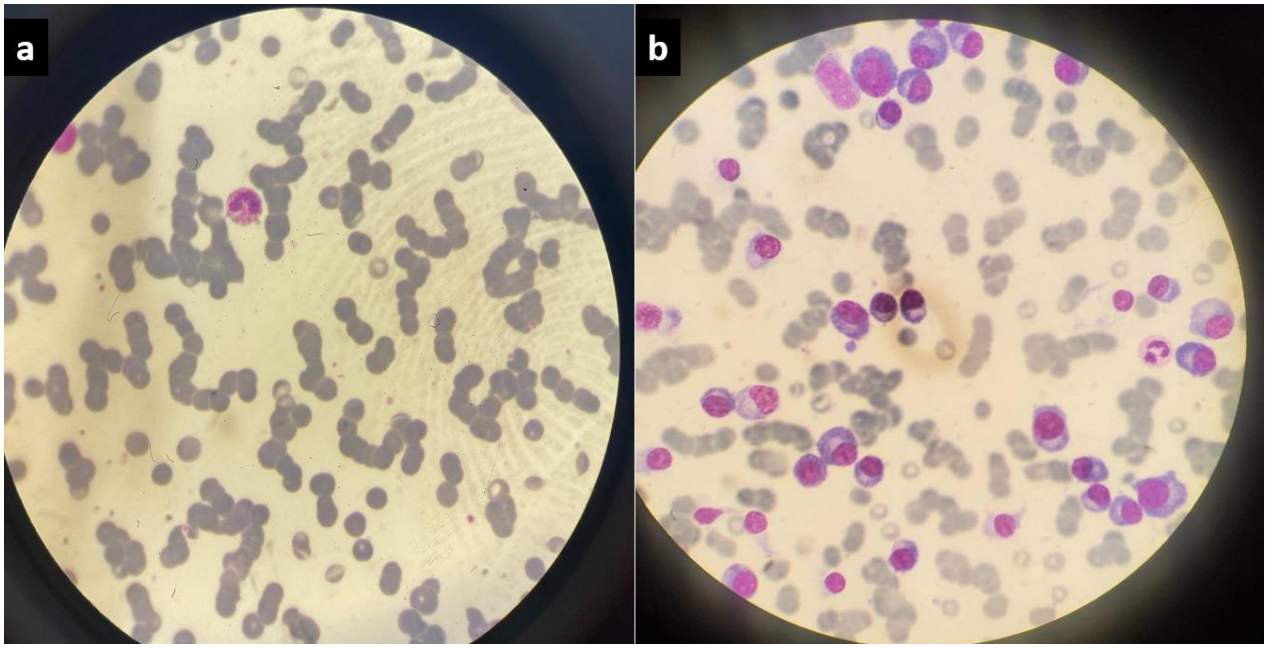

Figure 2: (a) Blood smear stained with MGG (G × 1000) showing red blood cells in rolls (b) Bone marrow smear stained with MGG (G × 1000) showing dystrophic plasma

DISCUSSION

Multiple myeloma is the second most common hematologic malignancy diagnosed in adults, with a median age of 69 years at diagnosis. Its occurrence in young adults is extremely rare, accounting for only 5% of multiple myeloma cases. Its frequency was 0.18% (7 patients out of 3,815) in a study by the National Cancer Institute and 0.3% (10 patients out of 3,278) according to the experience of the Mayo Clinic [3].

It is important to emphasize that this hematologic malignancy is much more aggressive in younger patients, but they generally respond well to treatment. This highlights the significance of our work, which reports a case in a much younger patient. Although data on the biological and environmental risk factors that may contribute to the diagnosis of multiple myeloma in young adults are limited, it appears that younger patients with multiple myeloma are more likely to carry pathogenic germline variants that predispose them to cancer, including germline mutations in DNA damage response pathways (e.g., BRCA1/2) or CDKN2A [4].

The diagnosis of multiple myeloma is established based on three major criteria: bone marrow plasmacytosis greater than 10%, hypercalcemia, anemia, renal insufficiency, bone involvement, amyloidosis, recurrent infections, and the presence of a monoclonal spike in serum and urine protein electrophoresis [5]. In our case, the patient presents with 95% bone marrow plasmacytosis, hypercalcemia, a monoclonal gammopathy spike, anemia, and multiple bone lesions. There are noted similarities in clinical and biological characteristics between both older and younger patients [6].

The study by Blade *et al*., was the only work to have observed Bence Jones proteinuria in 5 out of 10 young patients [7]. In our case, it was negative. The literature reports a high frequency of fractures and osteolytic lesions in very young patients, which is consistent with our case [6].

The study by Blade *et al*., identified an extramedullary component in 14 out of 17 young patients (82%) [7]. The treatment for young patients with multiple myeloma (MM) does not differ from that of older patients [6].

Treatment for multiple myeloma is determined by risk stratification based on FISH studies and the patient's suitability for autologous hematopoietic cell transplantation (HCT). Induction therapy for newly diagnosed MM generally consists of a triple regimen that includes bortezomib, cyclophosphamide, and dexamethasone. Newer therapies, such as daratumumab, are used as second-line options for relapsed multiple myeloma [8].

The response to chemotherapy treatment is estimated at approximately 50%. In most cases across all age groups, the response to treatment combining chemotherapy is significantly higher than in those treated with alkylating agents alone, with or without Prednisone.

However, there is no significant difference in survival between these two treatment regimens.

CONCLUSION

Multiple myeloma is very uncommon before 40 years old and rarely affects adolescents. In young adults, the clinical, biological, and radiological manifestations

do not differ significantly from those observed in older patients.

This case highlights the importance of considering multiple myeloma in patients under 30, particularly those presenting with multiple bone lesions, because, although rare, this disease can occur in young adults. Overlooking this possibility could delay diagnosis and treatment.

Acknowledgments: None

Declaration of Conflicting Interest: We have no known conflict of interest to disclose

Funding Statement: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical Approval and Informed Consent Statements: Written informed consent was obtained from the patient for publication of this case report.

Data Availability Statement: The data are available from the corresponding author.

Author Contributions: All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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