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A Case Report on Multiple Myeloma: Masquerading Neoplasm in a 36-Year-Old Female

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Authors' contributions

This work was carried out in collaboration among all authors. Author MM conceptualized and investigated the study, wrote and original draft of the manuscript. Author HA wrote original draft and performed the methodology. Author MOA wrote original draft and did data visualization. Author RP wrote, reviewed and edited the manuscript and did data validation. Author KB wrote, reviewed and edited the manuscript and supervised the study. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Aim: We aim to highlight this rare presentation to alert clinicians to atypical multiple myeloma (MM) cases, enabling earlier diagnosis and better patient outcomes. This report may contribute to the medical literature by illustrating how MM can masquerade as other conditions in absence of

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characteristic clinical features, leading to potential diagnostic dilemmas and pitfalls, hence, encouraging clinicians to maintain high index of suspicion, particularly in unusual demographics. This helps identify patterns or variations and stimulates further investigations into MM's different presentation and progression.

Presentation of Case: This article features a 36-year-old female with an initial presentation of fever, multiple symmetrical joint pains, oral ulcer, and alopecia with no hypercalcemia or lytic bone lesions, and provisional diagnoses of connective tissue disorders, lymphoma, leukemia, and infectious etiologies but confirmatory tests conclusive of MM.

Discussion: MM, a clonal plasma cell proliferative disorder, usually presents with osteolytic bone lesions accompanied by hypercalcemia, anemia, and/or renal dysfunction. It predominantly affects elderly males, with a median diagnosis age of 70. MM is rare under 40, creating less suspicion and delayed diagnosis. However, age is a pivotal prognostic feature because of its associated comorbidities and performance index; thus, young patients have a better prognosis, making early diagnosis even more important.

Conclusion: The consequences of undiagnosed MM are severe and show an increased risk of death underlining the cruciality of quick diagnosis with a Sherlockian mindset and interdisciplinary approach for lowering morbidity. This case underscores the importance of considering MM in differential diagnoses, even when it seems unlikely.

Keywords: Hematological; multiple myeloma; plasma cell dyscrasias; prognosis; young.

1. INTRODUCTION

Multiple myeloma (MM), a plasma cell dyscrasia, accounts for 10% of all hematological malignancies, characterized by an abnormal increase of monoclonal paraprotein leading to specific end-organ damage [1]. It is more common in males [2] and has a lower incidence in Asians than Caucasians [3]. In India, the incidence is about 0.95 per 100,000 [3]. The incidence increases with age, especially after 40, with two-thirds diagnosed over 65 [4,5]. It is rare in young adults (19-40 years), comprising 2% of cases [6,7]. Clinical manifestations include hypercalcemia, bone pain with lytic lesions, renal dysfunction, or anemia, with 80% having osteolytic bone disease at diagnosis [8]. It is diagnosed per the International Myeloma Working Group (IMWG) diagnostic criteria, significantly refined in 2014 [9].

This discussion features a case of a 36-year-old female, with initial presentation of fever, multiple symmetrical joint pains, oral ulcer, and alopecia with normal serum calcium levels and no lytic bone lesions, but confirmatory tests conclusive of MM.

2. CASE DISCUSSION

A 36-year-old lady presented with complaints of fever for the last four months and multiple symmetrical joint pains for the past two months. Her fever was remittent, low-grade, and associated with weight loss, anorexia, and dry cough. The joints involved were the knee, ankle, wrist, and elbow with associated swelling and morning stiffness. She also had a history of easy fatiguability, painless oral ulcers, and hair fall. There was no history of rash, frothy urine, abdominal pain, dry eyes, dyspnea, or tuberculosis. The patient underwent a hysterectomy procedure for menorrhagia four months before her current presentation, even after which she required blood transfusions over the last three months for anemia.

On examination, the patient had a low BMI (17.5 kg/m^2) and pallor, non-scarring alopecia, with normal vitals.

A respiratory examination revealed bilateral decreased breath sounds suggestive of pleural effusion. On musculoskeletal examination, joints were tender and swollen with a decreased range of motion. Lymphoreticular and gastrointestinal findings were non-contributory.

Based on history and examination findings, connective tissue disorders, hematological malignancies like lymphoma or acute leukemia, or infections like tuberculosis were the differentials.

Blood investigations revealed pancytopenia (Hb – 5.9g/dl, platelets – $0.8x10^5$/cc, total leukocyte count – 3400/cc), a low corrected reticulocyte count (1.05) with a normal (Neutrophil/Lymphocyte) ratio. Renal function test (RFT) showed normal serum urea (24

mg/dL), increased creatinine (1.9 mg/dL), and uric acid (10.8 mg/dL) levels. LDH (537 U/L), INR (1.64), PT (19.4s), and aPTT (45.3s) were elevated. Total serum protein (4.5 mg/dL) and albumin (2.23 g/dL) levels were low. Urine examination showed a strong presence of protein (+++), while blood was weakly present too, with normal urine albumin: creatinine ratio (138 mg/gm), however, the 24-hour urinary protein level (2748 mg/day) was grossly elevated. A direct Coombs test was performed to rule out a delayed blood transfusion reaction, but the result was negative. The rheumatological panel for antinuclear antibodies, rheumatoid factor, anti-CCP, and other autoantibodies were all negative with normal complement levels.

A high-resolution computed tomography (HRCT) of the chest gave an impression of pneumonia in the right middle lobe with bilateral pleural effusion (right > left). Serological tests and microscopic examinations for tuberculosis, HIV, hepatitis, and other relevant infectious diseases were negative.

Following preliminary investigations, neither of the differential diagnoses was favorable as major investigations for them were not in tandem.

Considering the presence of fever, arthritis and pancytopenia, with no evidence of an autoimmune etiology, as suspected earlier, and concurrent overflow proteinuria, there emerged a strong suspicion of MM at this point. Thus, a bone marrow biopsy was performed. While awaiting the results of the biopsy, other investigations relevant to MM were carried out. Whilst serum protein electrophoresis revealed hypoalbuminemia with an M band peak, characteristic of MM, ESR (15 mm/1st hour), serum calcium (9.2mg/dL), and albumin: globulin ratio (1.34) were normal, and radiological investigations did not reveal any lytic lesion of bone, which was atypical because usually these parameters are deranged in MM. However, serum free-light chain assay showed an elevated kappa: lambda ratio (936.6; kappa-free light chain >12260 mg/L; lambda-free light chain = 13.1mg/L). By this time, the bone marrow biopsy results had arrived which showed 30% of cells with a moderate amount of basophilic cytoplasm and eccentric nuclei with perinuclear-hoff (Fig. 1) with immunohistochemistry positive for CD38, CD138, and CD56 – confirming the presence of plasma cells.

Thus, the patient was diagnosed with MM as per the International Myeloma Working Group Diagnostic Criteria for multiple myeloma and related plasma cell disorders [9]. She was started promptly on a CyBorD (oral cyclophosphamide 300 mg/m^2 on days 1,8,15,22 + intravenous bortezomib 1.3 mg/m^2 on days 1,4,8,11 + oral dexamethasone 40 mg on days 1-4, 9-12, 17-20 on a 28-day cycle for four cycles) treatment regimen. There was symptomatic improvement with decreased proteinuria and monoclonal light chain levels, and the patient has been on regular follow-ups since.

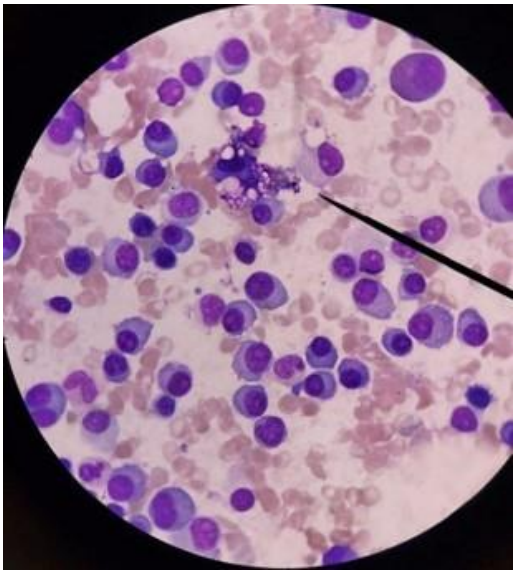

Fig. 1. Bone marrow biopsy showing cells with moderate basophilic cytoplasm and eccentric nuclei with perinuclear-hoff

3. DISCUSSION

MM occurs predominantly in the geriatric population, with the median age of diagnosis being 70 years [1], with more than 66% of newly diagnosed cases in people older than 65 [3]. Only 2% of people diagnosed with MM are less than 40 years old, [7] unlike our case where the patient was a 36-year-old female. Classically, complications that MM clinically manifests include hypercalcemia, renal insufficiency, osteolytic lesions, infection, and anemia [1]. However, our case followed a young female primarily presenting with the chief complaints of fever associated with dry cough, symmetrical joint pains, oral ulcer, alopecia, and examination findings suggestive of pleural effusion, which invariably led the physicians to consider connective tissue disorders, acute leukemia, lymphoma or infectious aetiologies. Approximately 75% of patients at diagnosis have pancytopenia, though only about 10% have a haemoglobin level lower than 8 gm/dl [10]. Calcium levels were normal without any evidence of lytic lesions of the bone - studies on myeloma bone disease place osteolytic bone diseases as one of the most prominent features, with almost 80% of patients presenting with it [10]. Thus, the absence of classical features raises low clinical suspicion of such neoplasms and misguides further away into a dilemma. Epidemiological studies have shown that mild renal impairment, maybe acute or chronic, is observed in about 25% of cases where raised serum creatinine levels fulfill the increased calcium, renal insufficiency, anemia, or bone lesions (CRAB) diagnostic criteria [9]. Hence, the evidence of deranged renal function test and overflow proteinuria of the patient raised curiosity furthering investigations like serum electrophoresis, which revealed an M band, a characteristic finding. Hence, this case highlights how thorough routine tests, prompt evaluation, and effective teamwork are pivotal in diagnosing patients with seemingly atypical presentations, especially in diseases like MM with heterogeneity across age, sex, and geography, which masquerades undiagnosed [3].

MM is probably the cancer with most prognostic parameters described, where age remains a crucial factor because of its associated comorbidities and performance index, besides other factors [11]. According to an analysis of 10,549 patients from the International Myeloma Working Group, MM was uncommon in young persons and more frequent in males [12]. However, young patients present with a significantly lower International Staging System (ISS) stage and consequently have a less frequent elevation of β2-microglobulin and better normalization of low serum albumin levels [12]. Hence, patients younger than 50 seem to have a better prognosis [12]. Survival was better but shorter in the younger age group as they showed an increased risk of death [13], thus, suspecting varied differential diagnoses of multi-symptom diseases like MM in the absence of conventional features and quick diagnosis is prime to allow a better recovery and prevent fatal outcomes.

4. CONCLUSION

MM, a clonal plasma cell dyscrasia can be referred to as a 'masquerading neoplasm' due to its varied clinical features and diagnostic tests, which can mimic other common malignancies and allow it to remain undetected in circulation. Although rare, it can present in young and female patients without typical signs such as hypercalcemia and osteolytic bone lesions. Therefore, it is crucial to maintain a high index of suspicion and conduct thorough testing to rule out MM. Early and accurate diagnosis is vital, as it is a treatable neoplasm with a favorable prognosis in younger patients, ultimately saving lives through timely intervention.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

CONSENT

As per international standards or university standards, patient’s written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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