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87-year-old patient with an atypical fracture – correct diagnosis requires diagnostic vigilance

Maksymilian Lech[1], Justyna Rentflejsz[2,3], Marcin Warpechowski[4], Martyna Niemczuk[1], Karolina Narejko[2], Jakub Śliwowski[5], Zyta Beata Wojszel[2,6]

[1] University Clinical Hospital in Bialystok
[2] Hospital of the Ministry of Interior and Administration, Białystok
[3] Doctoral School, Medical University of Bialystok
[4] Department of Biostatistics and Medical Informatics, Medical University of Białystok
[5] Interdisciplinary Students' Scientific Group at the Department of Geriatrics, Medical University of Bialystok
[6] Department of Geriatrics, Medical University of Bialystok

Abstract

Background. Plasma cell myeloma is a hematopoietic system neoplasm that is relatively frequent in the geriatric population. Unfortunately, the most common symptoms of the disease are nonspecific and may remain undetected for a long time. Many conditions typical of older patients – and occurring much more frequently – have similar signs, which can lull doctors' vigilance. ***Case description.*** An 87-year-old woman was admitted to the Department of Geriatrics and Internal Medicine of the Hospital of the Ministry of Interior and Administration with complaints of worsening pain in her left lower limb. She suffered a low-energy fracture of the shaft of the left femur 3 months prior. On radiological examination, there were signs of delayed union of the left limb fracture, and several nonspecific abnormalities on laboratory tests were observed. ***Conclusions.*** The case presented here aims to emphasise the importance of the holistic and detailed patient evaluation, especially for those from the geriatric population, and the need to maintain "diagnostic vigilance". Over time, the doctors' alertness to nuances and unusual symptoms should not decrease. Even the most trivial at first glance and "typical" cases may mask much more serious diseases. *Geriatria 2026;20:82-86. doi: 10.53139/G.20262002*

Keywords: multiple myeloma, atypical fracture, geriatric population

Introduction

Multiple myeloma (also known as plasma cell myeloma; MM) is a neoplastic disease characterised by uncontrolled proliferation of clonal plasma cells, most of which settle in the bone marrow [1]. They synthesise monoclonal antibodies in an unsuppressed manner, which can lead to systemic complications. Symptoms of the disease include, among others, osteolytic changes in the bones, resulting in a general decrease in bone density and pathological fractures, hypercalcaemia, anaemia, damage to the kidneys, muscles, and bone marrow, and the development of symptoms of chronic fatigue and rapid exhaustion [2]. MM is a disease that occurs primarily in older people – the median age of incidence is between 65 and 74 years [3].

Case study

An 87-year-old female patient was admitted to the Department of Geriatrics and Internal Medicine of the Hospital of the Ministry of Interior and Administration in Białystok, Poland, due to chronic abdominal and left lower limb pain and recurrent delirium in the evenings for several months. Three months earlier, the patient had suffered a low-energy fracture of the left femoral shaft, which was treated surgically with an intramedullary nail. The patient had been previously hospitalized with similar symptoms. At that time, the reported symptoms were attributed to the fracture and advanced age. In addition, the patient's medical history included hypertension, type 2 diabetes, heart failure with preserved left ventricular ejection fraction, and osteoporosis.

ORCID: Maksymilian Lech 0000-0002-9228-4332, Justyna Rentflejsz 0000-0002-2732-0982, Marcin Warpechowski 0009-0002-6967-5965, Martyna Niemczuk 0009-0006-5877-6356, Karolina Narejko 0009-0000-0564-4401, Jakub Śliwowski 0009-0006-0211-8215, Zyta Beata Wojszel 0000-0002-6472-5241

The patient was taking ramipril, bisoprolol, sertraline, allopurinol, and nonsteroidal anti-inflammatory drugs regularly for her chronic conditions.

The physical examination revealed an asthenic body build (weight at admission 40 kg, height 168 cm – BMI 14.2), dynapenia (muscle strength was significantly weakened – handgrip strength assessed with a dynamometer was approx. 5 kg on both sides), signs of dehydration, and tenderness of the entire abdomen on deep palpation, without muscle guarding.

Laboratory tests performed upon admission to the ward revealed: moderate macrocytic anaemia (Hb 9.2 g/dL, MCV – 105.9 fL), with normal vitamin B12 and folic acid levels, impaired kidney function (eGFR 42 ml/min/1.73 m^2; creatinine 1.16 mg/dL), elevated nitrogen metabolism parameters: hyperuricaemia (8.5 mg/dL) and hyperammonaemia (62.4 mg/dL), hypoalbuminaemia (2,78 g/dl) with normal total protein values (7.74 g/dl) and normal corrected calcium concentration (9.28 mmol/l). In addition, a general urine test revealed elevated protein concentration in urine – 55.1 mg/dl in a single sample. Imaging studies revealed the following abnormalities: abdominal ultrasound showed calcified deposits in the gallbladder and microlithiasis of the bile ducts, X-ray of the fractured limb showed the femur after intramedullary nail stabilization without signs of adhesion (figure 1).

The diagnostics were extended to include a proteinogram, which confirmed a distinct gamma-globulin peak (figure 2).

For this reason, the patient was referred to the haematology department with suspected multiple myeloma for further diagnosis and treatment.

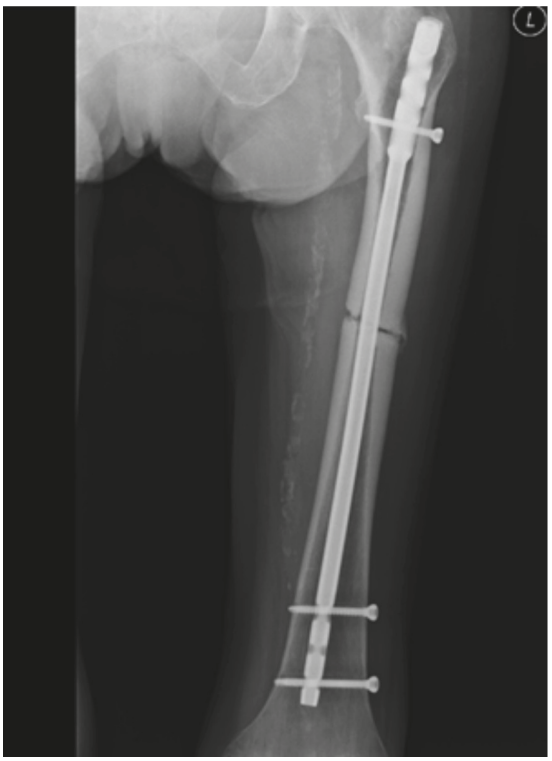

Figure 1. An X-ray of a broken limb, showing a fracture gap without signs of adhesion and with an intramedullary nail

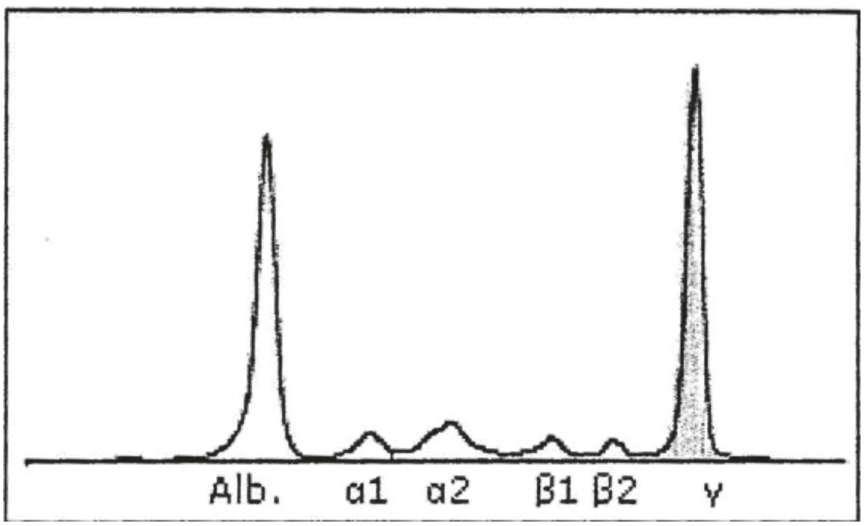

Figure 2. Proteinogram with a visible high gamma globulin peak

Discussion

According to the latest global epidemiological data (GLOBOCAN), multiple myeloma accounted for 0.9% of all diagnoses and 1.1% of all cancer deaths. In terms of sex, myeloma was 1.5 times more common in men [4]. In terms of age, it is typically a disease of older adults. The median age of onset is 69 years in the United States, and only 15% of diagnoses are made in people under the age of 55. It ranked 21st among all cancers in terms of incidence and 17th among causes of cancer deaths.

The symptoms of myeloma are likely to affect various systems. Common symptoms include bone pain and fractures, general weakness and easy fatigue, anemia, impaired kidney function (a result of disorders accompanying plasma cell proliferation, such as light chain deposition, hypercalcemia, taking nonsteroidal anti-inflammatory drugs for bone pain), recurrent infections, and excessive and unusual bleeding. Less common manifestations include amyloidosis, hyperviscosity syndrome, encephalopathy, and peripheral neuropathy [5].

To facilitate the diagnosis of multiple myeloma, the acronym CRAB was created, based on four typical features of end-organ damage in myeloma, which are also among the criteria allowing a correct diagnosis to be made.

C (calcium elevation) – elevated calcium concentration
R (renal insufficiency) – abnormal kidney function – elevated creatinine concentration
A (anaemia) – anaemia (most often normocytic)
B (bone abnormalities) – bone changes, bone pain.

The table presents these symptoms along with their frequency of occurrence in clinical practice and the context of our patient (table I).

The patient presented in the case report met three of the above criteria, as follows:

- The patient had been experiencing bone pain for several months, not only in the area of the fractured limb but also in the lumbar region. In addition, no signs of bone healing were observed in the fractured limb.
- Macrocytic anemia was observed, with normal vitamin B12 and folic acid levels in the blood.
- Elevated creatinine levels and reduced eGFR indicate renal failure (stage 3b).

The fourth abnormality, i.e., hypercalcaemia, can be considered fulfilled after taking into account comorbidities. Although calcium levels were within normal limits, it is worth considering the patient's complete clinical picture. She is cachectic and malnourished (body weight is 40 kg, BMI = 14.2), with osteoporosis diagnosed years ago, which may result in a lower initial calcium reservoir in her body. In addition, the patient's hypoalbuminaemia may result in relative hypercalcaemia due to a larger pool of ionised calcium, which is responsible for the main biological effect of calcium in the body.

The detection of monoclonal antibodies complements the clinical picture. Their increased synthesis may also manifest itself in basic tests as an increased concentration of total protein. However, it should be borne in mind that this result may be distorted, e.g., by malnutrition and the resulting hypoalbuminaemia, as in our patient. In her case, total protein remained within normal limits, but considering the fact of hypoalbuminaemia and signs of cachexia with sarcopenia, this result becomes noticeable and requires further diagnosis. A proteinogram can provide a detailed view of the distribution of individual protein fractions. The proteinogram shown in figure 2 presents a typical protein distribution with a distinct peak in the gamma globulin fraction. IgG antibodies are the most commonly synthesised antibody fraction (approx. 50%) in plasma cell myelomas, but not

Table I. CRAB – an acronym useful in diagnosing myeloma and the frequency of these symptoms in the clinical picture of the disease (according to UpToDate)[3]. The last column includes the symptoms presented by the patient

Letter of acronym	Symptom	Prevalence in myeloma at the time of presentation	Disturbances observed in the presented patient
C	Elevated calcium levels	28%	Corrected calcium concentration within normal limits, malnutrition and osteoporosis may distort the picture of abnormalities
R	Renal impairment	48%	Decreased eGFR values, elevated creatinine concentration
A	Anaemia	78%	macrocytic anaemia
B	Bone lesions/bone pain	58%	Bone pain, no signs of fracture healing

the only ones. Abnormal IgA, IgD, or IgM antibodies, or only lambda and kappa light chains, can also be present; hence, the proteinogram result may vary depending on the subtype of the synthesised protein [6]. The presence of abnormal proteins and their increased concentration can also be detectable in urine tests.

X-ray imaging remains helpful in the diagnostic process. The most commonly imaged changes involve osteolytic lesions (lumbar spine, pelvis, long bones, and skull bones). As the disease progresses, pathological fractures appear, e.g,, compression fractures of the vertebrae, which may additionally cause neurological symptoms resulting from nerve compression. Osteolytic lesions may present as "moth-eaten bone", where numerous minor and irregular defects in the bones are visible on X-rays [7].

There are no pathognomonic symptoms or abnormalities in basic laboratory and imaging tests that without any doubt indicate multiple myeloma. The diagnosis requires several tests, some of which are highly specialised, e.g., cytogenetic or immunohistochemical tests [8]. For this reason, suspicion of plasma cell myeloma is based primarily on a comprehensive assessment of abnormalities found in basic tests. Many independent diseases can cause each element of the CRAB acronym. Still, the coexistence of most symptoms indicates the need for further diagnosis to either rule out or confirm the diagnosis. However, it should also be borne in mind that the presence of symptoms that meet the criteria of this acronym indicates significant organ involvement and may be associated with a poor prognosis [9].

The multitude of symptoms affecting many organ systems and the non-specific and often latent nature of the disease make it challenging to diagnose. Nevertheless, increased awareness of myeloma can help shorten the time from the patient's first contact with a doctor to the start of treatment by specialists. It is crucial in the geriatric patient population, whose multimorbidity and general reduction in the body's compensatory abilities can mask the true causes of the reported symptoms. Data from a study by Kariyawasan et al [10]. indicate that in as many as 40% of patients with MM, the delay in diagnosis was more than 6 months from the onset of the first symptoms, even though 50% of patients in this group sought medical advice in the meantime. The authors point out that this phenomenon should not be interpreted as a problem or failure in primary health care. Still, it is a sign of how non-specific and difficult to interpret the most commonly reported symptoms are. This further emphasises the importance of raising awareness about this disease.

Multiple myeloma is a heterogeneous disease entity; therefore, accurate prognosis depends on many factors. Treatment focuses mainly on inhibiting disease progression, limiting its effects, and improving quality of life. Prolonging survival and maintaining a relatively good quality of life for longer depends significantly on detecting the disease as early as possible, before it has time to wreak havoc on the patient's entire body [11].

Conclusions

Multiple myeloma is a medical condition that causes many symptoms in various, seemingly unrelated body systems. The clinical situation is further complicated by the high prevalence of numerous diseases in the elderly population, in whom myeloma most often occurs. A thorough diagnostic evaluation, with a comprehensive assessment of test results and symptoms, is crucial for making the correct diagnosis. Early detection of the disease offers the chance to slow its progression and treat complications, which directly translates into an opportunity to prolong the patient's life and improve their quality of life.

Conflict of interest
None

Correspondence address
Maksymilian Lech
SP ZOZ MSWiA w Białymstoku im. Mariana Zyndrama-Kościałkowskiego
ul. Fabryczna 27, 15-471 Białystok
(+48) 47 710 42 43
maksymilian.lech1@gmail.com

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