IECC 2024 Conference

The 4th International Electronic Conference on Cancers

06–08 March 2024 | Online

A BONE MARROW BIOPSY REVEALING AN EXCEPTIONAL COMPLICATION OF MULTIPLE MYELOMA.

M.El Magroud(1), N.Karich(1), A.Haloui(1), N.MIRY(1), C.Bekhakh(1), A.Bennani(1)

(1): Anatomical pathology department, University Hospital Mohammed VI, Faculty of Medicine and Pharmacy, Oujda's Mohammed Premier University, Morocco.

INTRODUCTION & AIM

Bone marrow necrosis (BMN) is a relatively rare discovery in bone marrow biopsies (BMB); it is estimated to be present in less than 1% of cases (1,2). BMN is defined as the destruction of both the myeloid tissue and the medullary stroma, with the preservation of bone structures (3).

BMN is most commonly attributed to malignancy and chemotherapy (1,4). That being said, heterologous causes such as medication and infection have been incriminated in BMN.

We describe the case of a patient diagnosed with multiple myeloma (MM) presenting initially with extensive necrosis of the bone marrow in their biopsy. A finding that, to the best of our knowledge, remains an exceptional manifestation of this condition, only being described in five cases in the literature previously.

The particular nature of our case lies in the rarity of this presentation, which renders BMB interpretation challenging to pathologists who are unfamiliar with this complication.

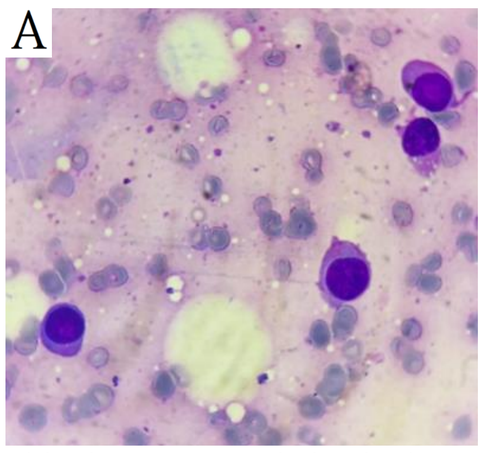
METHODES

We report the case of Mrs A, a 67-year-old patient with a medical history of repeated transfusions for iron deficiency anaemia and a fracture of the femoral diaphysis. The patient presented initially with severe anaemic syndrome and an alteration of her general state, associated with ostealgia, epigastric tenderness and polyuria.

Blood count showed a non-regenerative normochromic normocytic anaemia that is associated with thrombopenia and myeloma. The biochemical profile of the patient showed a malignant hypercalcemia with an alteration in the renal function.

Imaging found multiple geographical osteolytic lesions of axial and appendicular topography.

Bone marrow aspiration was performed, showing a sample of poor cellularity and the presence of a population of suspicious lymphoid-like cells (A).



(A): A bone marrow aspiration showing a population of medium to large cells, with a low nucleo-cytoplasmic ratio, basophilic occasionally vacuolated cytoplasm, and a nucleus with focally clumped chromatin.

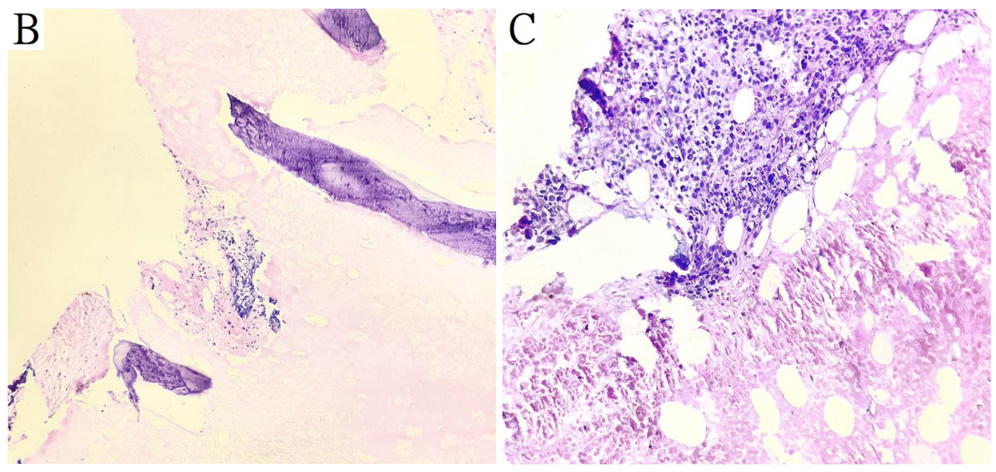
A bone marrow biopsy was performed and treated for histopathological study.

RESULTS

A histological examination of the fragments obtained showed multiple regular osseous trabeculae bordering marrow spaces that contained extensive tumoral necrosis which took up approximately 80% of the entire sample (B).

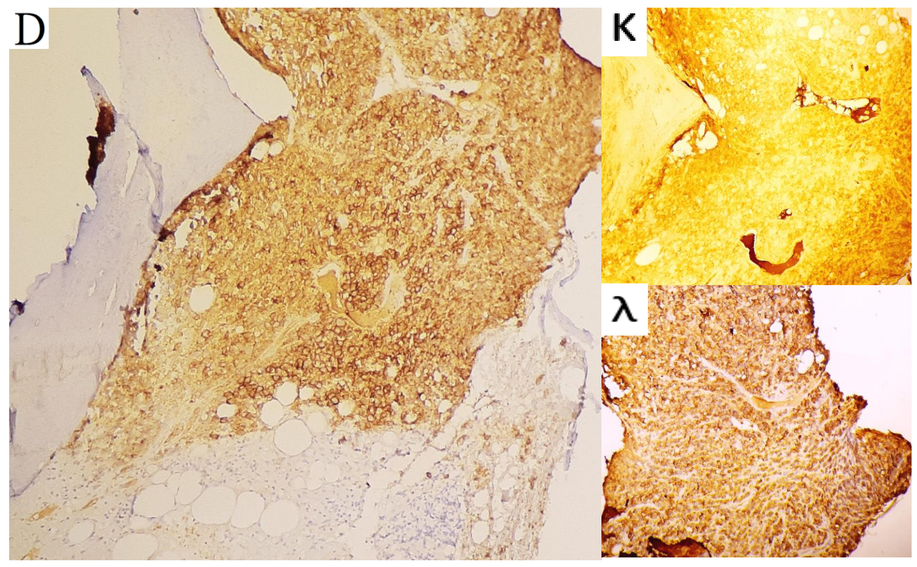
We also noted the presence of a tumoral proliferation of cells with hyperchromatic eccentric nuclei and an abundant basophilic cytoplasm evoking a plasmacytoid nature (C).

Bone marrow biopsy showing extensive necrosis of the marrow spaces with preservation of the osseous trabeculae (B), and islands of tumour cells suggesting a plasmacytoid origin (C).



An immunohistochemical study was carried out showing a positive marking of plasmacytoid cells by the CD 138 antibody with Lambda monoclonality (D).

Tumour cells are positive for CD 138 staining (D) with Ig Lambda monoclonality (K;λ).



By combining the histopathological and immunohistochemical findings with the patient's history, clinical presentation and imaging results, the diagnosis of multiple myeloma was made.

DISCUSSION

BMN is a rare finding in bone marrow biopsies and it is estimated that only around 300 cases have been reported in the literature. A detailed pathophysiology of this condition is yet to be properly established, with the prevailing hypothesis involving elevated levels of TNF-alpha and interleukin-6 causing damage to endothelial cells in the microenvironment, which results in vascular occlusions and necrosis (4).

Clinically, patients present with ostealgia, fever, elevated alkaline phosphatase, markedly elevated LDH levels and peripheral cytopenias with typical findings of bone marrow necrosis, the extent of which allows for the grading of BMN: grade I with necrosis involving less than 20% of the bone marrow; necrosis occupies between 20 and 50% of the bone marrow in grade II; and eventually grade III where the necrosis extends beyond 50% of the bone marrow (5).

A ten-year study by Wool et al. showed that malignancy—both secondary to a metastatic tumour and haemato-lymphoid malignancy – was responsible for 90% of BMN cases. BMN was also associated with poor prognosis, with a mortality rate of 55% during follow-up; however, Zhu et al (6). reported two cases of BMN with MM who received prompt treatment and showed complete restoration of hematopoietic function.

CONCLUSION

BMN is an exceptional discovery in BMBs and its aetiology is largely dominated by malignancy. To the best of our knowledge, BMN in MM has only been described in five cases in the literature; as such, the rarity of this finding may pose difficulties for pathologists during interpretation. The importance of pathologists' awareness of this possibility is amplified by the understanding that BMN is not only associated with a poorer prognosis for patients, but also that prompt diagnosis and treatment have introduced the possibility of recovery.

FUTURE WORK / REFERENCES

1. Wool GD, Deucher A. Bone Marrow Necrosis: Ten-Year Retrospective Review of Bone Marrow Biopsy Specimens. Am J Clin Pathol. 2015 Feb 1;143(2):201–13.
2. Eishi A, Ilkhanizade B, Rahimi E. Bone marrow necrosis: frequency and clinicopathological findings in marrow biopsies. Iran J Pathol. 2009;4(1):38–43.
3. Corti M, Soto I, Villafañe MF, Minué G, Campitelli A, Narbaitz M. Bone marrow necrosis as clinical presentation of plasmablastic lymphoma in an AIDS patient: first case reported and literature review. J Hematol Malig. 2013;3:57–62.
4. Bone marrow necrosis- an unusual rare finding in multiple myeloma. Hematol Transfus Int J [Internet]. 2017 Dec 13 [cited 2023 May 20];Volume 5(Issue 5). Available from: https://medcraveonline.com/HTIJ/HTIJ-05-00134.pdf
5. Sharma R. Multiple Myeloma: An Unusual Cause of Extensive Bone Marrow Necrosis. J Clin Diagn Res [Internet]. 2016 [cited 2023 May 20]; Available from: http://jcdr.net/article_fulltext.asp?issn=0973-709x&year=2016&volume=10&issue=6&page=XL01&issn=0973-709x&id=7914
6. Zhu AX, Niesvizky R, Hedrick E, Fata F, Filippa DA, Michaeli J. Extensive bone marrow necrosis associated with multiple myeloma. Leukemia. 1999;13(12):2118–20.