

CASE IMAGE

Charcot–Leyden Crystals in AML With *NPM1* MutationJoan Somja¹  | Patrick Collins¹ | Aurore Keutgens² | Adrien De Voeght³ | Françoise Tassin²¹Department of Anatomical and Cytological Pathology, University Hospital of Liège, Belgium | ²Department of Biological Hematology, University Hospital of Liège, Belgium | ³Department of Clinical Hematology, University Hospital of Liège, Belgium**Correspondence:** Joan Somja (joan.somja@chuliege.be)**Received:** 28 July 2025 | **Revised:** 13 January 2026 | **Accepted:** 9 February 2026**Keywords:** acute myeloid leukemia | bone marrow necrosis | Charcot–Leyden crystals | galectin-10 | *NPM1*-mutated

We report a rare case of Charcot–Leyden crystals (CLCs) in the bone marrow of a 76-year-old man with acute myeloid leukemia (AML) lacking eosinophilia, harboring *NPM1*, *TET2*, and *ZRSR2* mutations. After initial complete remission on venetoclax, azacitidine, and magrolimab, the patient developed persistent pancytopenia and diffuse bone pain. Subsequent marrow examinations revealed extensive bone marrow necrosis (BMN) and the presence of numerous CLCs in both smear and biopsy specimens, without detectable blasts in the marrow (Figure 1). Circulating blasts were subtle and scarce, measured at 2.1% by flow cytometry, with clonality confirmed upon further analysis through detection of *NPM1* mutation by quantitative PCR.

NPM1-mutated AML is present in ~30% of cases, often linked to favorable outcomes. BMN is a rare and severe AML

complication, typically presenting with fever, pancytopenia, and bone pain. The necrotic bone marrow contained CLCs, which are composed of Charcot–Leyden protein (galectin-10). These bipyramidal, hexagonal crystals are rarely seen in bone marrow and are more commonly associated with eosinophil-rich conditions, such as allergic reactions or parasitic infections. Although initially documented in AML in the 19th century, CLCs remain extremely rare in AML. Notably, CLCs have also been found in basophils, can be endocytosed by macrophages, and galectin-10 may be present in certain T-cell subtypes [1].

Recent reports associate CLCs with *NPM1*-mutated AML, suggesting a unique bone marrow microenvironment [1–3]. Emerging studies in the context of eosinophilia indicate that CLCs may not simply be an inert byproduct of cell degradation

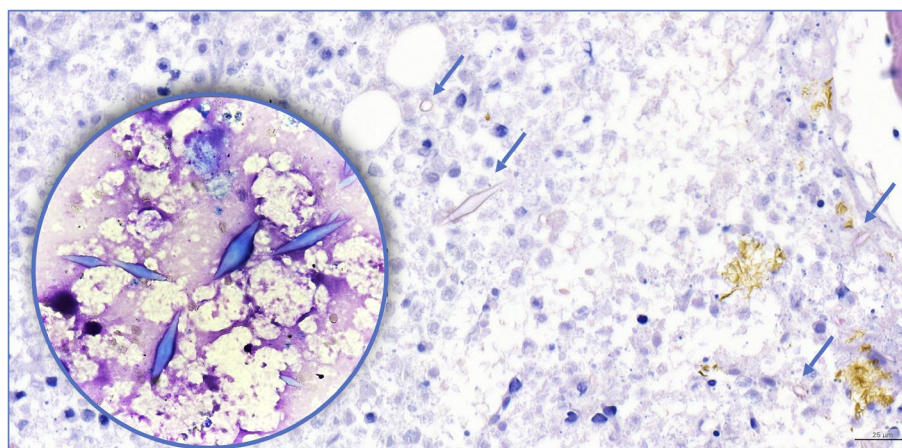


FIGURE 1 | Bone marrow biopsy at 400× magnification showing Charcot–Leyden crystals (arrow) in a background of bone marrow necrosis and hematoidin pigments. Inset: Oil-immersed bone marrow cytology at 1000× magnification highlighting Charcot–Leyden crystals.

but could play an active role by activating the NLRP3 inflammasome and upregulating chemokines and cytokines, including IL-1 β , IL-6, IL-8, TNF- α , and GM-CSF (1). A similar mechanism could plausibly contribute to bone marrow to AML cell proliferation, bone marrow inflammation, and necrosis. The association with *NPM1*-mutated cases points to a particular altered immune microenvironment that may drive a specific inflammatory response and represent a distinct entity.

In conclusion, CLCs in BMN should not be regarded as incidental findings and, even in the absence of blasts in the bone marrow, they should prompt consideration of AML. Furthermore, the possibility that CLCs contribute to disease progression or marrow inflammation warrants further investigation into their pathogenic role and their potential as therapeutic targets in *NPM1*-mutated AML.

Author Contributions

Aurore Keutgens and **Françoise Tassin** conducted the cytological analysis and took the pictures. **Adrien De Voeght** was the clinician in charge of the patient's care and contributed clinical data and interpretation. **Patrick Collins** and **Joan Somja** analyzed the bone marrow biopsy, took the photomicrographs, and Joan Somja wrote the manuscript.

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The authors have nothing to report.

Ethics Statement

Ethics approval was not required for reporting this single patient case, in line with institutional policies.

Consent

Informed consent for publication of the clinical details and images was obtained from the patient.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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