

Bone marrow necrosis in neuroendocrine tumor of the thymus

Benoît Ducourneau^{1,2}  | Claire Hemar¹

¹Laboratory of Hematology, Hospital center of Valenciennes, Valenciennes, France

²Laboratory of Hematology, Biology and Pathology Center, Lille, France

Correspondence: Benoît Ducourneau, Laboratory of Hematology, Hospital center of Valenciennes, Avenue Desandrouins, 59300 Valenciennes Cedex, France (ducourneau-b@ch-valenciennes.fr).

Key Clinical Message

The prognosis of patients with marrow necrosis secondary to neoplastic disease (often gastric adenocarcinoma) was found to be extremely poor with a median overall survival (OS) of few months. This case confirms the very poor prognosis and shows an association with a neural endocrine adenocarcinoma of the thymus.

KEY WORDS

adenocarcinoma of the thymus, bone marrow failure, medullary necrosis, myelogram

Bone marrow necrosis is a relatively uncommon clinicopathologic entity. It is most commonly found in patients with neoplastic disorders^{1,2} and severe infections³. Physiopathology is unexplained, and prognosis is very poor.

We report the case of a patient diagnosed in 2017 in Hospital Center of Valenciennes.

A 71-year-old woman was admitted in emergencies for a change in general state, asthenia, and paleness. Biologically, she presents severe anemia and thrombopenia.

At the entrance, the full blood count revealed a severe nonregenerative anemia (Hb: 3.9 g/dL; reticulocytes: $89 \times 10^9/L$) and a severe thrombopenia (platelets: $25 \times 10^9/L$) with erythromyeloidia and schistocytes. Other biological results showed elevated lactate dehydrogenase, transaminase (hepatic cytolysis), ferritin, an inflammatory syndrome, renal failure and a low prothrombin time.

This clinical presentation suggested four hypotheses: activated macrophagic syndrome, disseminated intravascular coagulation, thrombotic microangiopathy, but, finally, main hypothesis was medullary invasion or medullary infarction.

Thoracic-abdominal-pelvic scan was not showing abnormalities.

Sternal and iliac bone marrow aspiration revealed dark smears after May-Grünwald-Giemsa (MGG) coloration. Microscopic evaluation showed disintegrated cells and pyknotic nuclei. However, there was any nonhematopoietic cell observed in bone marrow smears (Figure 1).

Histological study confirmed probably bone marrow necrosis, and an underlying pathology was found with a neural

endocrine poorly differentiated adenocarcinoma of the thymus. PET scan allowed to show a medullary invasion of tumor.

General supportive measures were employed with red cell and platelet transfusion.

Chemotherapy was discussed, but the condition of the patient was too unstable for treatment.

The patient died 2 weeks later.

In the literature, etiology of bone marrow necrosis is reported with hematologic malignancy in 60% of cases and solid tumors in 31% of cases. The most frequent of hematologic malignancy are myeloid or lymphoblastic leukemia, chronic myeloid leukemia, and lymphoma. Concerning solid tumors, the most frequent is gastric adenocarcinoma followed by cancer of unknown origin, prostate adenocarcinoma, stomach, and colon cancer.⁴ In 9% of cases, there are other etiologies such as severe infections, drugs, sickle cell disease, and antiphospholipid syndrome.⁵

The symptoms of bone marrow necrosis include bone pain and episodes of fever, which are related to anemia and thrombocytopenia.

The prognosis of patients with marrow necrosis secondary to neoplastic disease (often gastric adenocarcinoma⁶) was found to be extremely poor with a median overall survival (OS) of few months.⁷ This case confirms the very poor prognosis and shows an association with a neural endocrine adenocarcinoma of the thymus.

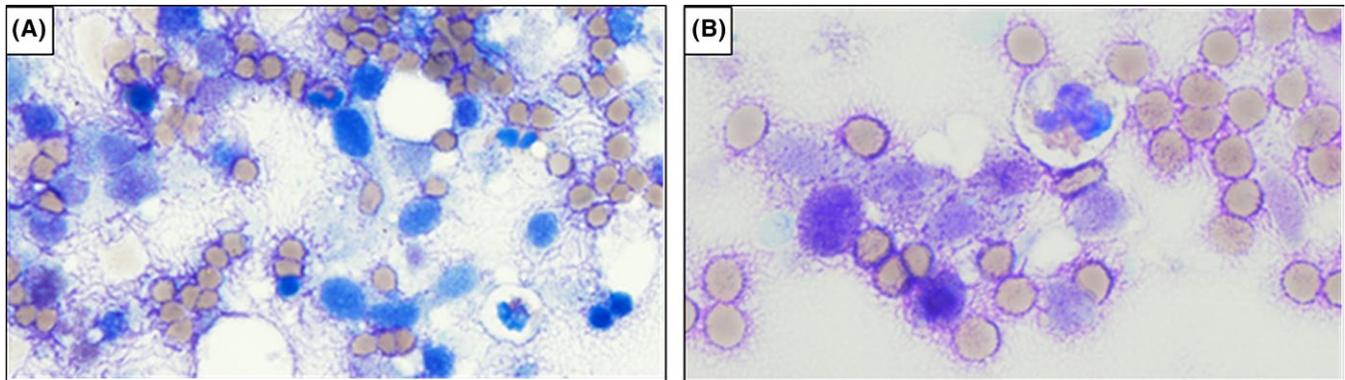


FIGURE 1 Microscopic images of medullary necrosis (A, Myelogram is richly cellular. The cells have an indefinite outline, and the intercellular space is purplish in color. May-Grünwald-Giemsa (MGG), immersion oil 500x) (B, At high magnification, cells are not identifiable with pyknotic nuclei, and external contours of the cells are not visible. The intercellular space shows a granular aspect, probably due to the degeneration of the stroma. MGG, immersion oil 1000x)

CONFLICT OF INTEREST

None declared.

AUTHORSHIP

BD: involved in interpretation of myelogram, drafting of the manuscript, and final approval of the manuscript. CH: contributed to reinterpretation of myelogram, discussion about the diagnosis, and final approval of the manuscript.

ORCID

Benoît Ducourneau  <http://orcid.org/0000-0001-6285-9273>

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