Pancreatic Myeloid Sarcoma Revealing Acute Myeloid Leukemia : A Case Report and Literature Review

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April 07, 2024

KEY CLINICAL MESSAGE:

Pancreatic myeloid sarcoma is a rare manifestation of myeloid neoplasms. Its diagnosis can be challenging due to its rarity and potential to mimic other pancreatic malignancies. We report a case of pancreatic myeloid sarcoma revealing acute myeloid leukemia.

KEYWORDS:

Myeloid sarcoma, Acute myeloid leukemia, Pancreas, Chemotherapy.

INTRODUCTION:

Myeloid sarcoma (MS), also known as granulocytic sarcoma or chloroma, is a rare extramedullary tumor composed of immature myeloid cells[1]. According to the World Health Organization (WHO) classification, MS is defined as a tumor mass consisting of myeloid blasts, with or without maturation, occurring at an anatomic site other than bone marrow [2]. MS can occur as isolated condition or be associated to other myeloid disorders like AML, myeloproliferative neoplasms, or myelodysplastic syndromes, either at the initial diagnosis and during relapse. [3]. The clinical manifestations of MS vary widely depending on the size and the location of the tumor. While MS can occur in various parts of the body, its infiltration of the pancreas is particularly rare and has been reported in only few cases in literature. This rarity can make the diagnosis challenging, especially since it can mimic other pancreatic cancer, which are more common[4,5]. This report presents a case of pancreatic MS revealing AML.

CASE PRESENTATION:

Case History / examination:

A 34-year-old man, with no past history, presented to the emergency department with jaundice, epigastric pain, vomiting and nausea. His physical examination revealed generalized icterus, 2 cm right inguinal adenopathy, hepatomegaly (hepatic span of 18 cm), and splenomegaly (splenic span of 16 cm).

Methods (Investigations and treatment):

Blood chemistry analyses revealed abnormal liver function tests which include elevated levels of liver enzymes: alanine aminotransferase (ALT) at 137 IU/L (N <34 IU/L) and aspartate aminotransferase (AST) at 120 IU/L (N < 31 IU/L), elevated bilirubin levels: total bilirubin at 268 mmol/L (N <25 mmol/L) and conjugated bilirubin at 161 mmol/L (N <5.1 mmol/L), and abnormal levels of alkaline phosphatases at 242 IU/L (N

<91 IU/L) and of -glutamyl transferase (-GT) at 133 IU/L (N <38 IU/L). Pancreatic function was also impaired with elevated lipase level of 127 IU/L (N <45 IU/L).

Blood count showed WBC count of 26.6 10^3/µL with 38% myeloid blast, hemoglobin of 11.6g/dL, and platelet count of 29000/µL. Therefore, the patient was admitted to hematology department for further exploration.

Bone marrow examination confirmed AML type FAB M4. Flow cytometry revealed leukemic cells positive for CD117, CD33, CD13, CD64, CD7 and cy MPO confirming AML-M4.

To further investigate the patient's digestive symptoms, along with the disturbances in liver and pancreatic function, an abdomino-pelvic computed tomography (CT) scan was ordered revealing a swollen appearance of the head and uncus of the pancreas measuring 37 * 38 mm, with enhancement similar to the rest of the pancreas associated with hepatomegaly (hepatic span of 20 cm), dilation of the bile ducts, splenomegaly (splenic span of 17 cm), and multiple intra-abdominal lymphadenopathies **(Figure 1).** Magnetic resonance imaging (MRI) showed a mass suspected in the uncinate process of the head of pancreas, causing intra- and-extra hepatic duct dilation **(Figure 2).**

The CA19.9 level was high at 85 U/ml (N < 27 U/ml) and the ACE was normal at 3 ng/ml (N < 40 ng/ml). Unfortunately, endoscopic biopsy of the pancreatic mass did not proceed due to severe thrombocytopenia and an increased risk of bleeding.

The diagnosis of AML-M4 was retained with a probable associated pancreatic MS and induction chemotherapy with Cytarabine and Idarubicin was started.

The bone marrow examination on day 28, following the induction chemotherapy, showing cytological failure of AML and the abdominal CT revealed the persistence of pancreatic masse.

The patient underwent a second chemotherapy course combining Cytarabine and Mitoxantrone leading to a complete cytological remission. In addition, abdominal CT scan and pancreatic MRI showed morphological remission with a total regression of pancreatic mass **(Figure 3)** .

Conclusion and Results (Outcome and follow-up):

The diagnosis of pancreatic MS was retrospectively retained based on the disappearance of the tumor after AML-chemotherapy.

The patient received then 3 consolidation chemotherapy courses and then he underwent to allogenic hematopoietic stem cell transplantation. After a 32-month follow-up, our patient is in complete persistent remission.

DISCUSSION:

Myeloid sarcoma is an extramedullary proliferation of immature myeloid cells that disrupts the normal architecture of the tissue where it originates [6]. Primarily, MS precedes AML, or both pathologies are discovered simultaneously. MS may also present de novo or as a relapse of AML [3] but isolated MS is extremely rare, with an overall incidence of less than 1% as compared with 2.5-9% in patients with AML [7]. MS mainly occur in skin, soft tissue, lymph nodes, testis and bones which makes clinical symptoms vary widely depending on the location of the tumor[8] .

However, pancreatic localization is extremely rare and, to our knowledge, only twenty-one cases have been reported in the literature[5,9,10] **(Table 1).** Pancreatic MS may be isolated [4,9,11–15], precede or appear concurrently with other hematological malignancies whether at initial presentation or at relapse [5,16–23]. The clinical symptoms of pancreatic MS are non-specific but almost all patients presented with epigastric or abdominal pain. Other symptoms can be associated such as jaundice, weight loss, fatigue, nausea or vomiting **(Table 1).**In fact, symptoms vary depending on the specific location of the tumor within the pancreas. While the tumor often localizes in the head of the pancreas, as is the case with our patient, the tail of the pancreas can also be affected in some cases **(Table 1)** .

Treatment strategies of pancreatic MS are limited because of the rarity of the disease and lack of randomized clinical trials. In addition, therapeutic choice is influenced by the different subsets including isolated MS versus synchronous MS, newly diagnosed, or relapsed[24]. Controlled clinical trials including and/or specific to MS patients are missing, making the superiority of one regimen over the others unknown. However, the use of systemic therapy is recommended. Moreover, the current National Comprehensive Cancer Network guidelines recommend treating isolated extramedullary MS with induction chemotherapy similar to that for patients with overt AML. This also applies to MS cases with concurrent bone marrow involvement[25]. Thus, the majority of reported cases of pancreatic MS have been treated by AML-Type chemotherapy **(Table 1).**Similarly, our patient obtained remission after 2 AML-Type chemotherapy courses leading to proceed allogenic hematopoietic stem cell transplantation. Conversely, the latest European LeukemiaNet (ELN) guidelines offer no specific recommendations [26].

CONCLUSION:

The rarity of pancreatic MS and the non-specific of clinical manifestation makes diagnosis challenging. The similarity in clinical presentation underscores the importance of considering MS in the differential diagnosis of pancreatic masses, especially in cases where the diagnosis of pancreatic cancer is not straightforward or where there is a history of hematologic malignancy. The occurrence of isolated pancreatic MS in a patient with no history of hematologic malignancy adds an additional layer of complexity to the diagnosis which can lead to potential delays in diagnosis and appropriate management. While rapid confirmation of the diagnosis is crucial to promptly initiate systemic therapy with AML-Type chemotherapy.

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Title of images and table (provided as a separate files):

Image 1: Abdominal CT scan after contrast: axial sections (a and b) and coronal reconstructions: Tissue mass centered on the head and uncus of the pancreas (white arrow), spontaneously isodense and moderately enhanced after injection of contrast. This mass is responsible of dilatation of the main bile duct (white arrow head) and intrahepatic bile ducts (black arrow). There are associated intraepithelial lymphnodes (black circle).

Image 2: MRI sections weighted in T2 (a), Diffusion (b) and T1 FATSAT after Gado (c): Pancreatic mass isosignal in T2, diffusion hypersignal and moderately enhanced after gadolinium.

Image 3: Control abdominal scan: Coronal reconstruction (a) and axial section (b) after injection of contrast at portal time: complete disappearance of the pancreatic mass (white arrow).

Table 1: Clinical characteristics, treatment and outcomes of literature reports of pancreatic granulocytic sarcomas

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`Table 1.docx` available at https://authorea.com/users/764691/articles/743598-pancreatic-myeloid-sarcoma-revealing-acute-myeloid-leukemia-a-case-report-and-literature-review