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CASE REPORT

LEUKEMIC PLEURAL EFFUSION AS INITIAL MANIFESTATION OF ACUTE MYELOID LEUKEMIA: A RARE CASE REPORT

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ABSTRACT: Leukemic effusion is an uncommon presentation of Acute Myeloid leukemia with only isolated reports in literature. We report a case of 45 years old female who presented with unilateral pleural effusion and was diagnosed with haematological malignancy on pleural fluid cytology which revealed presence of myeloblasts. Subsequent, peripheral blood smear and bone marrow examination confirmed the diagnosis of Acute Myeloid Leukemia (AML M1). This case report highlights the uncommon presentation of AML as well as utility of meticulous examination of effusion fluids for diagnosing unsuspected malignancies.

KEYWORDS: Pleural effusion, Acute Myeloid Leukemia, Myeloblasts.

INTRODUCTION: Leukemias either acute or chronic rarely manifest with malignant pleural effusion as the initial presentation. Such abnormal fluid collection is a complication which is more commonly seen in solid tumours lymphomas.[1] Although AML with leukemic pleural effusion is considered rare, the true incidence is not clear.[2] A leukemic involvement of pleural effusion has seldom been described.[3] Among the hematolymphoid malignancy the most common disorders are Hodgkin and non-Hodgkin lymphoma with a frequency of 20-30% especially if mediastinal involvement is present.[4] Acute and chronic leukemias are rarely accompanied by pleural involvement.[5] Most cases reported in literature concern acute lymphocytic leukemia and very few cases of acute non-lymphocytic leukemia.[6]

We report a case of middle-aged female who was diagnosed with unsuspected AML after pleural fluid cytologic examination.

CASE REPORT: A 45 years old female patient of low socio-economic status presented in our medicine OPD with complaints of progressive dyspnoea and dry cough for two months, which was insidious in onset and gradually progressive. There was history of loss of appetite.

On examination, patient was afebrile and slight pallor was present. Chest examination revealed a dull note on percussion and reduced intensity of breath sounds was seen on left infrascapular region. Chest X-ray revealed presence of left sided pleural effusion. A clinical diagnosis of anemia with left pleural effusion was kept. Pleural tapping yielded a hemorrhagic fluid which was sent to our department for evaluation.

Fluid was haemorrhagic, exudate in nature and its protein content was 4.8 gm%. Cytological examination of pleural fluid revealed primitive blast cells with high. N: C ratio, scanty to moderate basophilic cytoplasm, with prominent vacuoles in fair number of blasts. These cells were seen singly and in small groups along with numerous mesothelial cells and chronic inflammatory cells on a haemorrhagic background. A diagnosis of leukemic pleural effusion was made and a haematologic work up was suggested.

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Subsequently, complete blood count (CBC) showed- Haemoglobin level of 8.1 gm%, Total leukocyte count of 68,000/mm^3 and platelet count of 30,000/mm^3. Peripheral blood smear examination showed majority of nucleated cells (92%) to be myeloblast. Many blast showed cytoplasmic vacuolation and occasional presence of fine azurophilic granules. Myeloperoxidase (MPO) staining was done and blasts were MPO positive. So, diagnosis of acute myeloid leukemia was made. Bone marrow examination confirmed the diagnosis of AML-M_1.

Thus, cytologic examination of pleural fluid established the cause of effusion as well as prompted the detection of an unsuspected haematological malignancy.

DISCUSSION: Haematologic malignancies especially leukemia, rarely present with or develop pleural effusion during the clinical course of the disease.[7] More rare is the detection of leukemic cells in pleural effusion as the first morphologic manifestation of the disease.[8] Clinically significant pleural effusion regardless of etiology are rarely encountered in patients with AML.[9]

AML generally presents with signs and symptoms due to complications of pancytopenia like fatigue, haemorrhage and infections.[1,4] Extramedullary involvement may accompany medullary involvement at the beginning or may occur as a complication.[4] AML may be associated with extramedullary tumour growth, which is commonly known as myeloid sarcoma.[2] Granulocytic sarcoma occurs in 3-7% cases of AML and it can present before, during or even after the diagnosis of AML[7] Granulocytic sarcoma may present as a serous effusion and can be diagnosed on a cytologic specimen.[10]

Solid leukemic deposits may occur on or adjacent to serous cavities and may therefore result in effusion.[11] Although tumours often shed abundant malignant cells, singly and in cluster, the interpretation of malignancy is much more difficult in body fluid than in any other cytologic media because of exuberant proliferation of cells within the fluids.[12] The serous fluid usually contains large number of dispersed neoplastic cells, which have a variable appearance depending upon the type of leukemia, but most have primitive haematological blast like morphology often with some degree of maturation along with monocyte/ granulocyte series.[11]

Acute myeloid and monocyte leukemias may be confused with large cell lymphoma. Immunocytologic examination of cells obtained from pleural fluid, flow cytometry as well as polymerase chain reaction applied to cytological specimens can contribute to the differential diagnosis. The obtained findings sometimes need to be confirmed by pleuroscopy or thoracoscopy with surgical biopsy.[6]

Besides direct infiltration of leukemic cells in the pleura, pleural effusion can be secondarily caused by toxicity, underlying infections, secondary malignant or rarely auto-immune causes in haematologic malignancies.[5] So, in patients with leukemia the possibility of alternate causes of effusion such as bacterial and viral infections or complications of chemotherapy should be excluded.[12] Possible mechanism of leukemic pleural effusion in patients with Acute Myeloid Leukemia include– (a) extramedullary proliferation of a quiescent leukemic clone with subsequent metastases to BM; (b) A sub-clinical marrow relapse undetected by standard methods with consequent seed to extra-medullary sites.; (c) Cytogenetic abnormalities with poor prognosis include icomplex karyotype -5, del (5q),-7 or abnormality of 3q.[4] It should be noted that patients with various forms of leukemias, successfullyl controlled for a period of years may develop malignant lymphomas and that transformation may be observed in effusion.[13]

The prognostic significance of the presence of a pleural effusion at diagnosis in patients with leukemia is not easy to determine. Some author sustain that it does not affect the rate of remission and survival.[14] Others report a worse prognosis especially in patients with plasmacytic and Hairy cell leukemia.[6]

Hence, prognostic impact is unclear and patients should be given standard AML chemotherapy whenever possible.[2] In most cases the pleural fluid responds to the treatment of primary disease, whereas the resistant or relapse cases may necessitate pleurodesis.[7] However, recurrence of pleural exudates is almost inevitable if patients do not achieve remission. They may then present with a respiratory failure due to massive fluid accumulation. In this circumstance treatment or palliation of pleural disease by intrapleural chemotherapy or chemical sclerosis is indicated.[6]

Leukemic effusion may become more common in an era of improved care and prolonged survival for AML patients.[2]

Thus, cytology is a useful tool to study malignant effusions. However, in uncommon malignancies presenting as effusions, a detailed clinical history and ancillary investigations are often required to make a correct diagnosis.

To conclude, primary presentation of AML as pleural effusion merits documentation for its rarity and prompted us for this report. A synergistic approach with meticulous cytological examination and haematological, cytochemical and other relevant investigations enable an accurate diagnosis.

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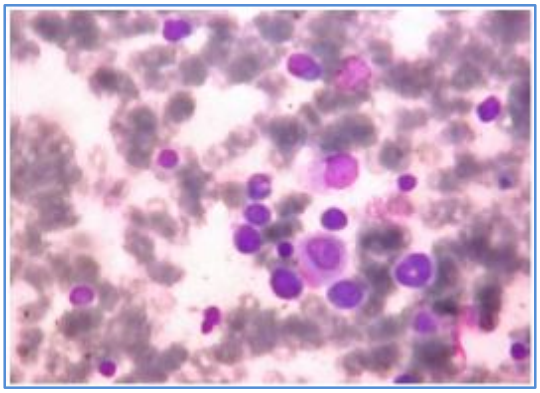

Fig. 1: Pleural Fluid showing myeloblasts and mesothelial cells (Leishman, X 400)

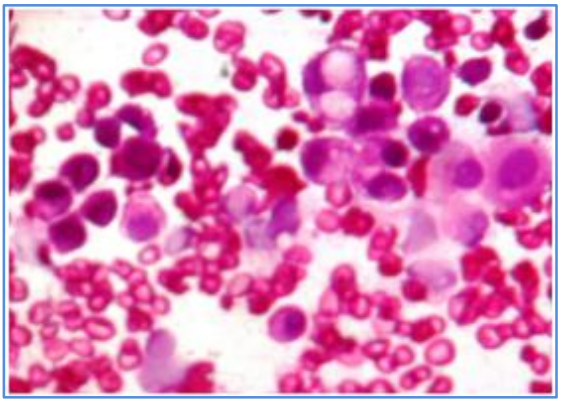

Fig. 2: Myeloblasts and mesothesial cells in pleural fluid.(H and E, X 400)

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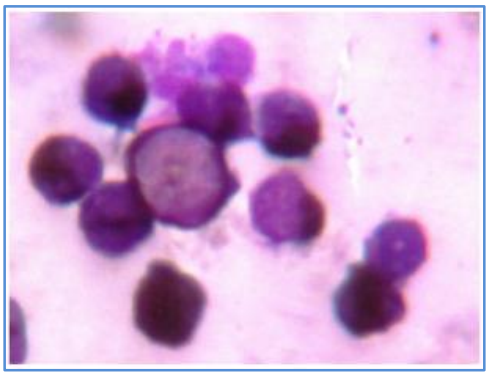

Fig. 3: Myeloblasts showing positive MPO staining. (MPO, X 400)

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