Granulocytic Sarcoma of the lung in Acute Myeloid Leukemia

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Background: Granulocytic sarcoma, an uncommon solid, extra-medullary tumor is a rare presentation of acute myeloid leukemia. **Case characteristics:** A seven-year old boy admitted to the hospital for treatment of leukemia having radiological findings of consolidation in one lung. **Observation/Intervention:** A bronchoalveolar lavage was done which was negative for tubercular, bacterial, and fungal infection but showed blast cells. **Outcome:** On day seven of chemotherapy, a repeat chest x-ray showed resolution of the lesion. A high-resolution Computerized tomography of chest repeated after one month of induction showed resolution. **Message:** A consolidation on chest radiograph in acute myeloid leukemia can be a granulocytic sarcoma of the lung; a bronchoalveolar lavage may be offered to confirm or refute this diagnosis.

Keywords: *Acute myeloid leukemia, Bronchoalveolar lavage, Sarcoma.*

Granulocytic sarcoma is a solid, extra-medullary tumor comprising of granulocytic precursor cells. It is a rare presentation of acute myeloid leukemia (AML). The most common sites of involvement are the skin, bone, soft tissue and lymph node. We report a child with granulocytic sarcoma of the lung.

CASE REPORT

A seven-year-old boy was referred to our hospital with history of fever and cough for the past ten days along with bodyache and fatigue for the past three days. His peripheral blood smear done elsewhere had blast cells. His chest *X*-ray showed left upper zone opacity (***Fig.* 1**).

He was admitted to our hospital; a complete blood count revealed hemoglobin of 8.8 g/dL, total leucocyte count of 50,500/mm^3 and platelet count of 50,000/mm^3. Bone marrow was replaced by blasts. His cerebrospinal fluid was also positive for malignant cells. Immunophenotyping confirmed blasts to be positive for CD13, CD33, CD14, CD34 and HL-DR. This was consistent with M4 subtype of acute myeloid leukemia. Karyotype was normal and cytogenetics were negative for t (8; 21), PML-RARA, inv (16) and monosomy 7. High-resolution computerized tomography (CT) of chest showed left upper lobe consolidation with centrilobular nodules (***Fig.* 2**).

Broad-spectrum antibiotics and voriconazole were started empirically. A bronchoalveolar lavage (BAL) done on day two of admission was hemorrhagic and mucoid. No bacteria or fungus was detected on microscopy and culture. Galactomannan was negative in the BAL fluid. Microscopy showed atypical round cells with round cleaved nucleus and scanty rim of cytoplasm, similar to those seen in blood and bone marrow examination. The cells were myeloperoxidase positive suggestive of blast cells. There were no reactive cells. A diagnosis of granulocytic sarcoma of the lung was made and chemotherapy was started as per AML 15 protocol. He received daunorubicin 50 mg/m^2 by slow intravenous push on day 1, 3 and 5, and cytosine arabinoside 100 mg/m^2 12 hourly by intravenous push on days 1 to 10.

On day seven of chemotherapy, a repeat chest *X*-ray showed resolution of the lesion (***Fig.* 1**). A high resolution CT of chest repeated after one month of induction also showed resolution (***Fig.* 2**).

DISCUSSION

Granulocytic sarcomas are uncommon extra-medullary, solid tumors composed of granulocytic precursor cells. The most common sites for these are skin, bone, soft tissue and lymph node [1]. It is commonly associated with acute

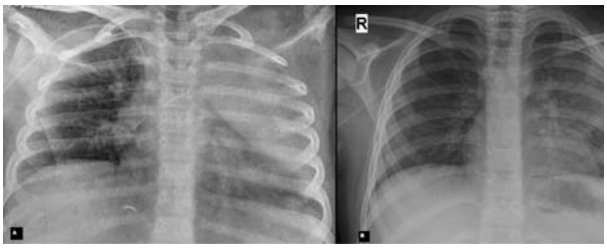

FIG. 1 *Image showing chest X-ray before (a) and seven days after (b) induction chemotherapy.*

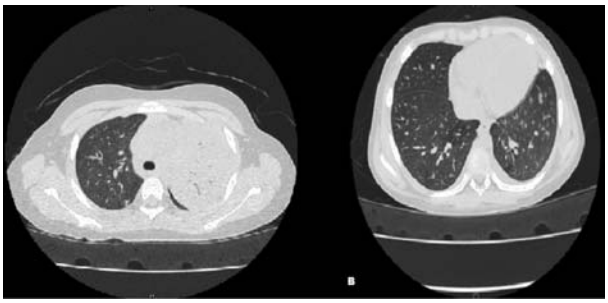

FIG. 2 *Image showing HRCT chest before (a) and one month after (b) induction chemotherapy.*

myeloid leukemia, but it may indicate leukemic transformation in myelodisplastic disorders, chronic myeloid leukemia, myelofibrosis, polycythemia vera or chronic eosinophilic leukemia [2,3]. Granulocytic sarcoma does not seem to have any prognostic significance in acute leukemia [4].

Granulocytic sarcoma in the lung is a rare entity [4]. In our case, the patient had an opacity visible in his chest *X*-ray and CT scan. Such focal masses during the course of acute myeloid leukemia may be an infection, hemorrhage or secondary neoplasms, apart from a granulocytic sarcoma [5]. It is known to be confused with opportunistic infections of the lung [6,7]. A diagnosis of granulocytic sarcoma is usually based on its appearance, location and a concurrent diagnosis of AML [8]. The tissue confirmation is done by morphology, and with stains like myeloperoxidase, periodic-acid schiff and neuron specific enolase [8]. The appearance of myeloblasts can range from well differentiated to poorly differentiated within a granulocytic sarcoma [9]. In our child, a possibility of fungal and bacterial infection was considered but BAL showed blast cells confirming the diagnosis of granulocytic sarcoma.

We conclude that a consolidation on chest radiograph in acute myeloid leukemia can be a granulocytic sarcoma of the lung; a bronchoalveolar lavage may be offered to confirm or refute this diagnosis.

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Skimmed Milk Preparation in Management of Congenital Chylothorax

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Background: Treatment for congenital chylothorax is based on adequate drainage of the pleural fluid and total parenteral nutrition followed by re-establishment of feeds using medium-chain-triglycerides based milk formulas which are expensive and not easily available. **Case characteristics**: Two newborns (one term and one preterm) with congenital chylothorax. **Intervention:** Skimmed milk preparation for enteral nutrition to provide high protein and low fat diet. **Outcome:** Successful resolution of chylothorax. **Message**: Skimmed milk preparation may be used for enteral nutrition of babies with congenital chylothorax where other feeding alternatives or commercial formulas are either not successful or are not available.

Keywords: *Chylothorax, Neonate, Octreotide, Skimmed milk preparation*