Case Report

Early diagnosis and prompt therapy can save one's eye

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ABSTRACT

Myeloid sarcoma (MS) also known as granulocytic sarcoma or chloroma, is a rare extramedullary tumor of immature myeloid cells. MS is reported in 2.5-9.1% of patients with acute myeloid leukemia (AML) and occurs concomitantly, following or rarely, antedating the onset of systemic bone marrow leukemia. Orbital involvement by acute MS is relatively rare. However, in the setting of simultaneous bilateral orbital tumors in children, MS appears to be a highly likely, if not the most likely, diagnostic possibility. Any child with an orbital mass of uncertain origin, particularly if it is a bilateral, should undergo prompt evaluation for underlying AML. Early diagnosis and prompt therapy can save one's eyes.

Key words: Early evaluation, myeloid sarcomas, orbits, prompt management

INTRODUCTION

Myeloid sarcoma (MS), also known as granulocytic sarcoma or chloroma, is a rare extramedullary (EM) tumor of immature myeloid cells.[1] MS is reported in 2.5-9.1% of patients with acute myeloid leukemia (AML) and occurs concomitantly, following or rarely, antedating the onset of systemic bone marrow leukemia.[2,3] The tumor commonly involves sites including subperiosteal bone structures of the skull, paranasal sinuses, sternum, ribs, vertebrae, and pelvis; lymph nodes and skin are also common sites. Orbital involvement is reported about 3% of all MS cases.[4] Unilateral or bilateral proptosis is the most common sign of presentation with orbital involvement. Here, we report a case of bilateral proptosis in a child with reviews of the literature.

CASE REPORT

A 6-year-6-month-old male child presented with fever along with painless, progressive swelling and ulceration of both eyes for 1-month and single episode of bleeding per nose 3 days back in a previously healthy boy. On clinical examination, his vitals was stable, moderate pallor, no cyanosis, jaundice or clubbing, spleen-not palpable, liver-enlarged, 4 cm below right costal margin, cervical and axillary lymph nodes significantly, enlarged bilaterally, and swelling (proptosis) with ulceration of conjunctiva and cornea in both the eyes [Figure 1a].

Peripheral blood smear shows normal total white blood cell count and moderately, reduced platelet count. In the differential, there were 8% of blasts that prompted urgent bone marrow examination. Cellular bone marrow aspirate (BMA) showed 49% of blasts with convoluted nuclei, a moderate amount of cytoplasm with occasional Auer rods [Figure 2]. Blasts are positive for Sudan Black B. Megakaryocytes reduced in number and morphological diagnosis of (AML), FAB-M2 was made. Immunophenotyping (IPT) by flow cytometry showed the gated cells in the blast window expressing cMPO, CD13, CD15, CD33, CD117, cCD79a, CD19, CD22, CD34 and negative for HLA-DR, CD10, CD14, CD20, cCD3, CD2 and CD7. The IPT findings are consistent with mixed phenotypic acute leukemia with myeloid and B-lymphoid differentiation. Conventional cytogenetic study in BMA revealed: 45X, t(8; 21)(q22; q22), -Y chromosomal pattern in all cells studied [Figure 3]. Magnetic resonance imaging scan of orbit showed a homogenous enhancing soft tissue (iso-intense in T1, hyper-intense in T2) seen at superior and lateral aspect of both orbits at its extra-conal

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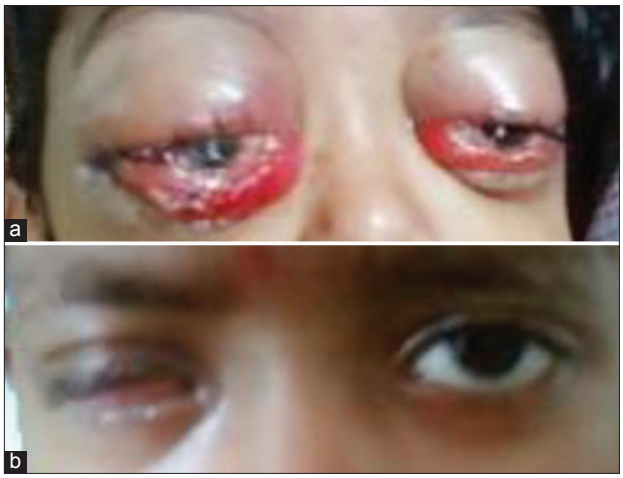

Figure 1: (a) Swelling (proptosis) with ulceration of conjunctiva and cornea in both the eyes and (b) 4 weeks after starting chemotherapy, before initiation of consolidation therapy, eye swelling completely disappeared and vision improved in left eye with residual corneal opacity in the other eye

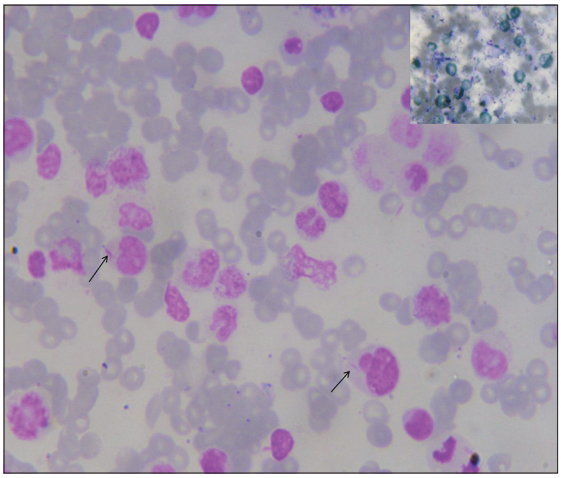

Figure 2: Cellular bone marrow aspirate showed 49% blasts with convoluted nuclei, moderate amount of cytoplasm with occasional Auer rods. Inset-blasts are positive for Sudan Black B

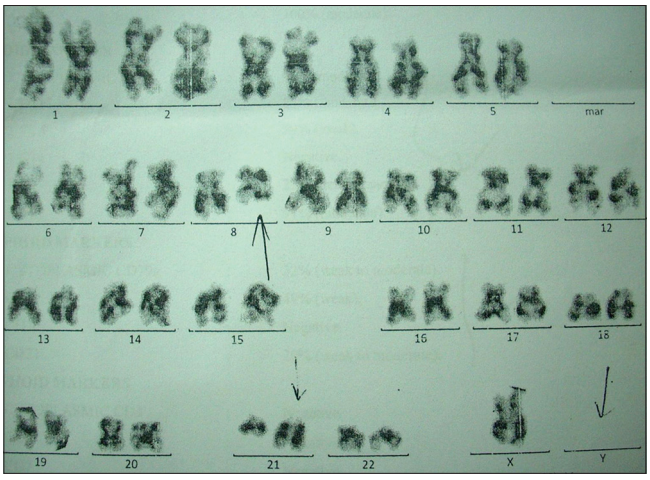

Figure 3: Conventional cytogenetic study in bone marrow aspirate revealed: 45X, t(8; 21)(q22; q22), -Y chromosomal pattern in all cells studied

space resulting proptosis of both eyes. Intra-conal spaces are normal on either side. Both optic nerves and its covering appear normal.

The day after admission, after receiving the BMA morphology report, the child was started with remission induction chemotherapy with cytarabine, daunorubicin, etoposide (Ara-C, daunorubicin, VP-16) according to AML BFM-93 protocol.[5] Proper eye care was given as per advice of a consulting ophthalmologist. Four weeks after starting chemotherapy, before initiation of consolidation therapy, eye swelling completely disappeared [Figure 1b] and vision improved in left eye with residual corneal opacity in the other eye. Ophthalmic examination revealed pupils reacting to light. The patient subsequently completed the consolidation phase and maintenance therapy and now on regular follow-up.

DISCUSSION

The diagnosis of MS in patients with an established leukemia is relatively, straightforward and should always be included in the differential diagnosis of patients with AML who develop a soft tissue mass.[1] Granulocytic sarcoma is rare manifestations of the AML and associated with diverse cytogenetic changes in the leukemic blast, in particular the core binding factor leukemia AML M2 t(8;21). The incidence of 4.5–38% is represented with t(8;21)(q22;q22) with development of granulocytic sarcoma.[6] Males are commonly, affected compared to females. Unilateral or bilateral proptosis is the most common sign of presentation with orbital involvement. Lateral wall of orbits is more commonly affected than medial wall. However, the clinical presentation of the patient may be variable. Involvement can occur either in a known patient of AML or else AML is detected later or during the course of the disease.[7] Dinand *et al*. reported a 10-year-old boy with right proptosis for 8 months. The eyeball was grossly pushed down, with diffuse corneal haze and nonreactive pupil.[8] Orbital involvement in acute MS is relatively rare. Aggarwal *et al*. reported a series of 31 biopsy-proven orbital granulocytic sarcomas with their immunohistochemical features and stressed that knowledge of this entity is important because early diagnosis and prompt treatment are associated with a better prognosis.[7] In our case, the male child presented with bilateral protrusions of eyes and clinched the diagnosis of AML from routine examination of peripheral blood smear. Many authors have stressed upon the importance of peripheral smear examination.[9] However, in the setting of simultaneous bilateral orbital tumors in children, MS appears to be a highly likely, if not the most likely, diagnostic possibility. Any child with an orbital mass of uncertain origins, particularly if it is bilateral, should undergo prompt evaluation for underlying AML.[9,10]

The disease is relatively uncommon in the western hemisphere, but is more prevalent in the Middle East, Asia, and Africa. Most of the larger reported series have come from Turkey and India.[10]

Extramedullary involvement with or without bone marrow disease by acute leukemia is a relatively rare, but clinically significant, phenomenon that often poses therapeutic dilemmas. MS presenting concurrently with marrow involvement always warrants systemic treatment directed at the underlying leukemia.[1] There have been no randomized trials addressing the optimal treatment for patients with EM involvement. The standard approach is to treat with conventional AML type chemotherapy with regimen choices and to dose following standard age and cytogenetic-based risk profile.[11] The results of AML BFM-93 in terms of estimated 5-year survival rate (60 ± 3% [SE]) and event-free survival rate (51 ± 2%) for the total group of patients are significantly better than those of previous study (AML BFM-87) and similar to those of the successful Medical Research Council AML 10 trial in children.[5] In our case, the child was treated with AML BFM-93 protocol, with a satisfactory response in terms of continued bone marrow remission status and also salvation of eyes with improvement of vision.

CONCLUSION

The case was a challenge to us in the time of early diagnosis and also initiating chemotherapy on morphology basis at the earliest to save one's eye.

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