Case study

Bilateral orbital chloroma revealing acute myeloid leukemia: a case report

KEYWORDS: Acute myeloid leukemia, exophthalmos, orbital biopsy, chemotherapy

ABSTRACT:

Chloroma is a rare extra-myeloid tumor composed of leukemia cells derived from granulomatous myeloid precursors. It occurs in only 2 to 8% of acute myeloid leukemia and rarely occurs in the orbital area. We report the case of an adolescent with no specific history, who consults for rapidly progressive bilateral exophthalmos. A blood count showed leukocytosis, bicytopenia and absence of cells blastics. Cranio-orbital computed tomography showed a bilateral multilobed orbital tumor process invading the oculomotor muscles and the optic nerve. Orbital biopsy confirmed the diagnosis of acute myeloid leukemia.

The positive diagnosis is guided by the blood count and confirmed by the biopsy of the orbital tumor and the myelogram. The radiological assessment is of interest in the evaluation of the tumor extent and post-treatment monitoring.

The treatment is based on chemotherapy and corticosteroid therapy combined or not with radiotherapy.

INTRODUCTION:

Myeloid sarcoma, also called chloroma, granulocytic sarcoma, or extramedullary myeloid tumor is a rare extra-myeloid tumor in the orbit made up of immature leukemia cells from granulomatous myeloid precursors. It can be associated with acute myelogenous leukemia, myelodysplastic syndrome, or chronic myelogenous leukemia, synchronously or asynchronously, upon initial diagnosis or upon relapse.

Granulocytic sarcoma represents 2 to 8% of acute myeloblastic leukemia [1] and most often affects children under 10 years of age (75% of cases), and in particular infants (52% of cases) [2]. In children, it is often indicative of leukosis. Orbital chloroma occurs in 8% of acute myeloid leukemias. The locations described are numerous: bone, skin, eye socket, lymph nodes, digestive tract, and central nervous system [3]. Its localization in the orbit is rare, and would rather be the prerogative of children under 10 years of age suffering from acute myelogenous leukemia de novo [4]. This is a factor of poor prognosis for most patients, according to most authors [5].

We report a case of bilateral granulocytic sarcoma of the orbit occurring in a 16-year-old child revealing acute myeloid leukemia.

Case Presentation:

This is a 16-year-old child, with no particular pathological history, hospitalized in the ophthalmology department with bilateral exophthalmos (Fig. 1) developing for 1 month and in whom the ophthalmological clinical examination finds: a visual acuity with positive light perception, lagophthalmos, ptosis and non-reducible non-axile exophthalmos with 360 degree chemosis in both eyes. Examination of the anterior segment revealed an inferior para axial epithelial-stromal corneal abscess and corneal edema. Faced with this environmental disorder, the ocular ultrasound did not identify any intra-vitreous organization, retinal detachment or intraocular tumor.

An orbital CT scan was performed, highlighting a bilateral intra-orbital tumor process contrasting with an invasion of the OMs (upper right + external right + upper oblique) as well as the left optic nerve. (Fig. 2 and 3). The complete blood count showed anemia at 11.2 g / dl with the absence of blasts and an LDH level of 1344 IU / l.

A series of biopsies were performed using a 14G core needle, histological analysis showed round cell tumor proliferation with immunohistochemistry: P8 and PT negativity with CD 34 positive. Confirming the diagnosis of acute myeloid leukemia. A myelogram produced shows a medullary richness by the presence of 77% of blast cells, with a crosslinked chromatin nucleus, nucleolus, basophilic cytoplasm, granular with AUER rod, MPO positive in 100% of blasts. Immunophenotyping: LAM-MPO (+) with CD13 +, CD34 +, CD15 +, CD117 +, HLA-DR + and MPO +. The diagnosis retained was that of acute myeloid leukemia type 2.

The patient was transferred to the clinical hematology department, where treatment was started with systemic chemotherapy: aracytine 180 mg x 2 / d, D-blastine 80 mg and methotrexate, systemic corticosteroid therapy and local treatment with artificial tears and fortified eye drops (ceftazidime and vancomycin).

The evolution on day 7 of chemotherapy (fig. 4) was marked by regression of eyelid tumors and chemosis, a favorable evolution of the right eye with visual acuity at AV 08/10 and a decrease in the size of the corneal abscess and the onset of scarring in the left eye.

DISCUSSION :

Granulocytic sarcoma was first described by Burns in 1811 [6]. In 1873, King baptized it "chloroma" because of its green color at the cut [7]. The link with acute leukemia, first credited to Van Recklinghausen by Dock in 1904 [8], was confirmed in a series of 21 cases in 1904 by Dock [9].

The myeloid character was confirmed by labeling with myeloperoxidases in 1912 [10]. It was not until 1996 to designate this tumor a granulocytic sarcoma: or extra-medullary tumor that has myeloid B cells, 30% of the "chloromas" not being green in color due to the presence of monocytic and non-myeloid tumor cells [2, 11] Finally in 2001, the WHO classified this tumor as "myeloid sarcoma" [12].

Granulocytic sarcoma is found in 2 to 8% of patients with acute myelogenous leukemia [1]. It is more common in the M4 and M5 forms [11].

The triggering factor for the appearance of granulocytic sarcomas in myeloblastic proliferations is poorly understood. The role of the human myeloid cell line HSM-1, which can adhere to the stroma of the skin, has been implicated in explaining the formation of granulocytic sarcomas of the skin [11]. Granulocytic sarcomas have also been associated with chromosomal translocation (t8; 21) (q22, q22) [14], and chromosome 16 inversion [15]. More interesting are undoubtedly the studies relating to adhesion molecules. Lisuka et al. [16] noted that among 10 patients treated for acute myelogenous leukemia whose cells expressed NCAM (Neural cell adhesion molecule, CD56), 40% developed granulocytic sarcoma. This could be the explanation for extra-medullary tumor adhesion.

The most frequent locations are bone, lymph node and skin [17]. According to Giordano's thesis, the localizations propagated to the orbit are the second in frequency [18]. Orbital imaging, although not very specific, helps guide the diagnosis. Computed tomography shows a heterogeneous, extensive, osteolytic mass, but which relatively respects the intra-orbital elements. It is enhanced by the contrast product at the periphery, maintaining a central hypodensity [19, 20].

On magnetic resonance imaging, the tumor appears isointense in T1 and T2 mode to muscles and bones with homogeneous contrast enhancement [19].

The ophthalmologic clinical examination and radiology don't always point to this etiology, which can mimic orbital lymphoma, metastatic localization or even a malignant sinus tumor spread to the orbit, as is the case in this patient. In addition, histological confirmation of the hematological origin of this tumor after orbital biopsy is sometimes difficult, especially in aleukemic forms.

The tools currently used during anatomopathological analysis are more sensitive and the discovery of abnormalities during hematological workup improves the specificity of the aetiological diagnosis. Histology of the patch shows proliferation of undifferentiated cells whose myeloid origin is suggested by the use of vital stains (Leder and MayGrunwald-Giemsa stain) [21].

The diagnosis of granulocytic sarcoma can be confirmed by specific immunohistological markers for lysozymes as well as by the "MAC 387" technique according to Stokl et al. [21]. The biological assessment confirms the hematological origin of this tumor syndrome by finding a circulating blastosis greater than 5% on the blood count.

The diagnosis of acute myelogenous leukemia is based on the analysis of the myelogram, which must objectify a rich marrow with a blastosis greater than 30%. The cytologic and cytochemical study of the blasts determines the subtype of acute leukemia.

Treatment is hematological and consists of intravenous chemotherapy combining systemically prescribed cytostatic agents. Orbital radiotherapy may be combined in the event of a significant risk of compressive optic neuropathy or ischemic arterial occlusion.

These therapies usually allow a dramatic decrease in the orbital tumor process to be observed within a few days. The prognosis of granulocytic sarcoma is functional by damage

to the optic nerve, but above all vital by pancytopenia. The average life expectancy is 7 to 8 months in patients with orbital granulocytic sarcoma, demonstrating the negative nature of this involvement during the course of acute myeloid leukemia [22].

CONCLUSION :

For any ophthalmologist, it is important to think about acute myeloid leukemia before a rapidly progressive uni or bilateral exophthalmos. The management is multidisciplinary involving ophthalmologist, onco-pediatrician, radiologist and biologist. Orbital chloroma is a therapeutic emergency whose visual prognosis is reserved in the event of delayed treatment.

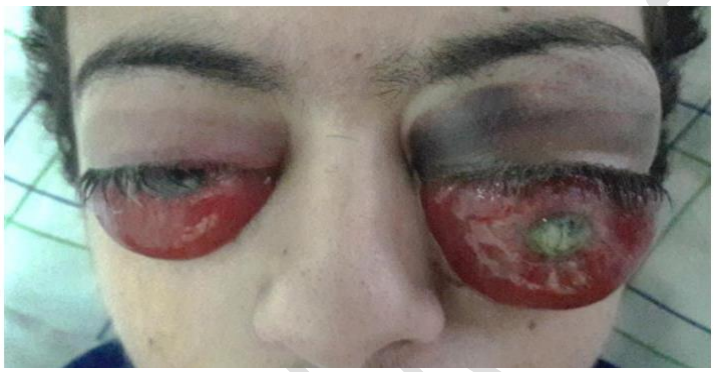
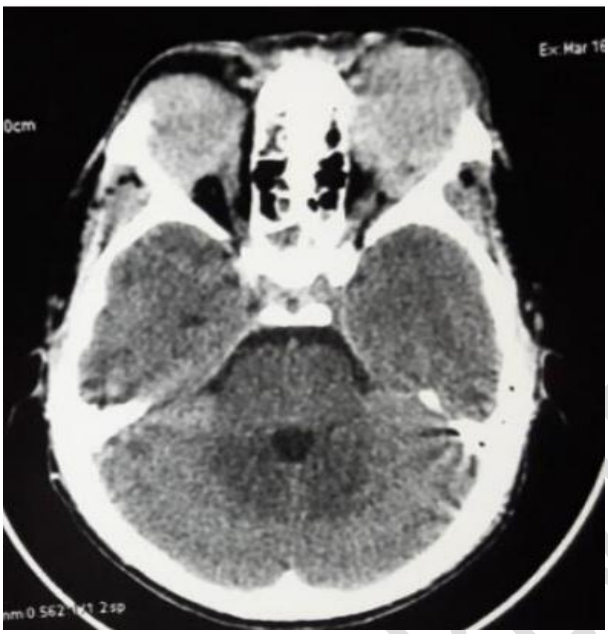
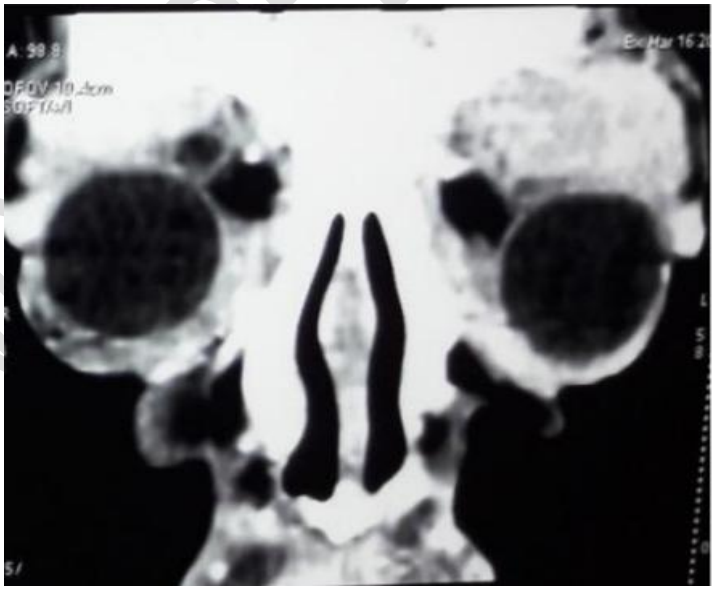


Figure 1: Inflammatory exophthalmos, chemosis and lagophthalmos



<u>Figure 2:</u> Orbital CT (axial slice): Bilateral intra-orbital tumor process taking contrast measuring 31x46x25 mm on the left and 27x34x23 mm on the right with invasion of the left optic nerve.



<u>Figure 3:</u> Orbital CT (coronal slice): Invasion of oculomotor muscles

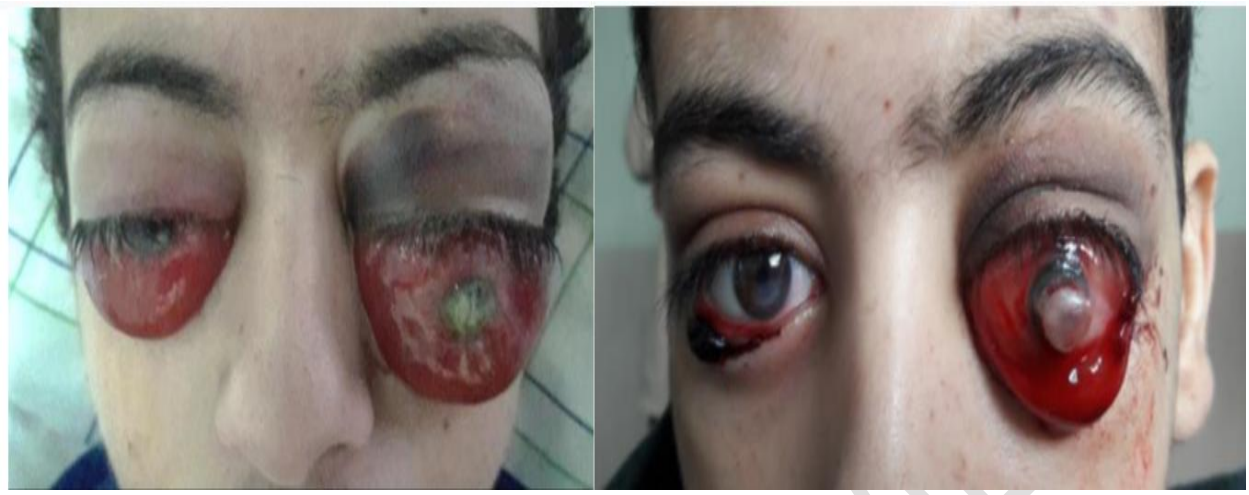


Figure 4: Evolution of the orbital chloroma. Right: Before treatment. Left: one week after chemotherapy.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.