• Letter to the Editor •

Myeloid sarcoma of the eyelid mimicking pre-septal cellulitis in acute myeloid leukemia

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Dear Editor,

I am Dr. Jungyul Park from the Division of oculoplasty, Department of Ophthalmology, Pusan National University Hospital, Busan, Korea. I write to discuss a case of myeloid sarcoma of the eyelid mimicking pre-septal cellulitis in acute myeloid leukemia (AML). This article does not contain any studies with human participants or animals performed by any of the authors and informed consent for publication was obtained from the family of the patient in this case report, as potentially identifying information may be included in this article.

Myeloid sarcoma is a rare extramedullary manifestation of leukemia, which can occur in isolation or concurrently with a myelodysplastic syndrome, myeloproliferative disease, or AML. Ocular myeloid sarcomas may appear at any time during the course of AML, and often develop simultaneously during onset or relapse of systemic symptoms of leukemia[1-3]. Ocular involvement of myeloid sarcoma is uncommon, few cases of eyelid involvement have been reported[4]. According to previous reports, myeloid sarcoma on the eyelid forms a mass-like lesion[5-7]. In this case report, we present a case of a patient, who has a history of lymphadenopathy for several months, with an eyelid myeloid sarcoma, which mimicked pre-septal cellulitis without a palpable mass, as the presenting sign of AML without systemic symptoms.

A 68-year-old Asian man with a history of lymphadenopathy for several months presented to our clinic with a right upper eyelid swelling, which had been recalcitrant to treatment (at another tertiary medical center) for orbital cellulitis of the eyelid. The painful swelling was reddish, relatively hard, and partially necrotic with blackish discoloration on the eyelid crease area. No palpable mass, madarosis, or proptosis were found (Figure 1). Orbital computed tomography revealed diffuse skin thickening and subcutaneous enhancement of the right periorbital space (Figure 2). We diagnosed the lesion as pre-septal cellulitis; thus, empirical antibiotics were initiated and laboratory blood tests were performed. Despite treatment with broad-spectrum antibiotics for 5d, the lesion did not subside and necrosis increased. Eyelid biopsy was performed, which showed myeloblasts with limited cytoplasm, round-to-oval nuclei with fine chromatic and prominent nucleoli. Numerous mitotic figures were identified. Immunostaining was positive for myeloperoxidase and negative for cluster of differentiation (CD) 3, CD15, CD10, CD20, and CD34 (Figure 3). The pathological diagnosis was myeloid sarcoma. Laboratory test results were as follows: white blood cell count 50 000/μL with neutrophil 12% (band neutrophils 0 and segmented neutrophils 12%), lymphocytes 11%, monocytes 6%, eosinophils 0, basophils 0, metamyelocytes 0, and blasts 70%; red blood cell count 3.99×10^6/μL; hemoglobin 8.8 g/dL; platelets 674 000/μL; C-reactive protein 3.66 mg/dL. Blood cultures showed no bacterial growth. The patient underwent a bone marrow biopsy for further workup by the hematology/oncology department, which revealed an AML. He was administered two cycles of Ara-C and Idarubicin chemotherapy for 3 and 4d, respectively. The right upper eyelid swelling and blackish lesion were satisfactorily subsided after concurrent treatment with chemotherapy and antibiotics. However, the patient's AML became aggravated, leading to development of pneumonia; as a result, the patient died 4mo after the initial examination.

There are two major types of acute and chronic leukemia: lymphocytic and myelocytic. Thus, there are four patterns of leukemia: acute lymphocytic leukemia, chronic lymphocytic leukemia, acute myelocytic leukemia, and chronic myelocytic leukemia[8]. Among these four, although it is less common, acute myelocytic leukemia can be observed initially with orbital involvement, most commonly in young children[5,8].

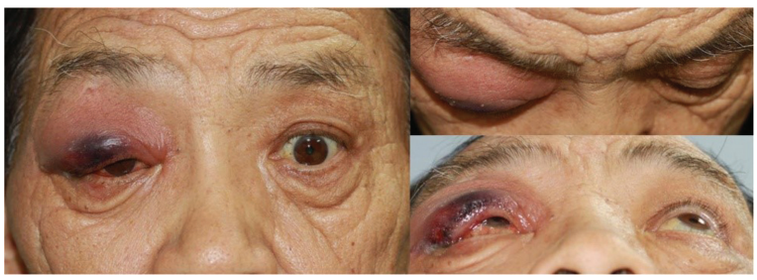

Figure 1 Clinical photographs of the patient demonstrate a mild right sided ptosis with indurated eyelid, swelling, erythema and blackish skin color change The conjunctiva on right eye is injected and mild chemosis was found. No palpable mass was found.

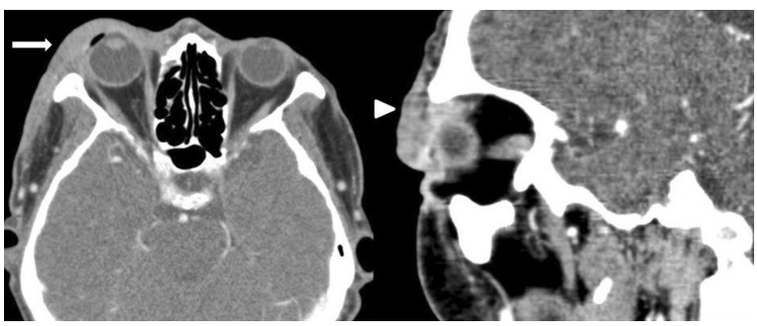

Figure 2 Orbital computed tomography (non-enhanced) demonstrate diffuse skin thickening (white arrow) and subcutaneous layer enhancement (white arrow head) of right periorbital, right zygomatic and right preseptal space.

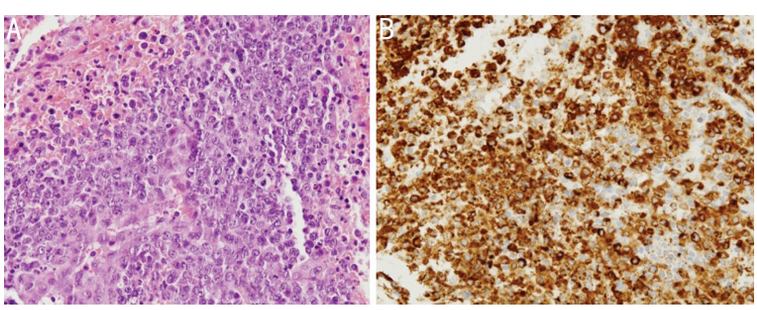

Figure 3 The specimen is composed of myeloblasts with limited cytoplasm, round-to-oval nuclei with fine chromatic and prominent nucleoli (A). Numerous mitotic figures were identified. H&E stain, ×400. Positive immunostaining for myeloperoxidase (B). These findings suggested myeloid sarcoma.

Soft tissue infiltrations of leukemic cells that form a tumoral lesion have been referred to as a granulocytic sarcoma or chloroma[9-14]; however, the term “myeloid sarcoma” is currently preferred[15]. If the lesion resembles cellulitis and involves dermal infiltrations of leukemic cells, it is called Sweet’s syndrome or acute febrile neutrophilic dermatosis. Sweet’s syndrome is characterized by fever, neutrophilic leukocytosis, erythematous, and tenderness of skin lesion that respond well to corticosteroid therapy[16-17].

Myeloid sarcoma is a rare disease with an incidence of 2/1 000 000 in adults; it occurs at any site of the body, but the most common locations are soft tissues, bone, peritoneum, lymph nodes, and the gastrointestinal tract[2,18-19]. It occurs in various parts of the body, including in one or both eyes and periorbital regions; few cases have originated from the lacrimal glands or extraocular muscles, often causing proptosis and diplopia[20]. Myeloid sarcoma arising from the eyelids is very rare, all prior cases have been found as tumors or mass-like lesions[6-7]. Only one case of eyelid cellulitis as the first manifestation of AML has been reported in the literature: the patient in that case was a 17-year-old young man, on whom no eyelid biopsy was performed[21]. In the present case, we observed no leukemic symptoms in our elderly patient; we ultimately discovered a myeloid sarcoma on the eyelid as an initial manifestation of AML, previously diagnosed as unilateral eyelid cellulitis; to our knowledge, this has never been previously reported.

Infiltration of leukemic cells into periocular tissue can cause cellulitis[8]. However, the patient in the present case exhibited progressive worsening of the lesion, despite the application of broad-spectrum antibiotic regimens, including antifungal agents. Therefore, we concluded that these symptoms were due to myeloid sarcoma presenting as cellulitis. In terms of clinical symptoms prior to histological examination, it is necessary

to consider Sweet's syndrome as a differential diagnosis, although it is characterized by specific symptoms that were not present in this patient. Moreover, we diagnosed our patient with myeloid sarcoma by eyelid biopsy[16].

On the basis of previous studies of myeloid sarcoma in the literature, infiltration of myeloid sarcoma to the orbital and ocular adnexa, as well as the surrounding organs and tissues, is more prevalent in pediatric patients, with 88% experiencing exophthalmos; notably, there was no proptosis in our patient, who did not present with characteristic symptoms or history of leukemia. In contrast to our patient, bilateral tumor has been observed more frequently than unilateral tumor. Nevertheless, these reports have not clearly explained initial symptoms, features, or directionality of myeloid sarcoma arising from the periorbital regions, including the eyelids. Based on these prior reports, myeloid sarcoma can infiltrate the orbital and ocular adnexa in various ways. If an elderly patient without characteristic leukemic symptoms shows lesions suggestive of eyelid cellulitis that do not respond to adequate treatment, clinicians should consider the possibility of myeloid sarcoma as a differential diagnosis; these lesions may constitute the initial manifestation of AML[5,8,20,22-23].

The patient in this case received antibiotic treatments for multiple days in multiple hospitals; consequently, his bone marrow examination and final diagnosis at our center was delayed. From this report, we conclude that it is essential to consider various differential diagnoses for a patient with cellulitis and to perform in-depth blood tests and biopsies to ensure that the patient receives appropriate treatment early.

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