

CASE REPORT

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Small lymphocytic lymphoma in true trilineage hematopoietic tissue within heterotopic ossification in an enucleated blind painful eye: a case report

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Abstract

Background: The finding of hematological malignancies within bone marrow in heterotopic ossification has been reported only a handful of times previously in the literature. We described a case of true trilineage hematopoiesis in an excised area of heterotopic ossification from an enucleated blind painful eye.

Case presentation: A 70-year-old Caucasian man, positive for asymptomatic lymphoplasmacytic lymphoma, presented with a blind painful right eye in our ophthalmology department to evaluate enucleation bulbi. After enucleation, a histopathologic examination revealed the presence of intertrabecular infiltration in the metaplastic bone marrow of non-Hodgkin B lymphoma, with small lymphocytes, with similar characteristics to the already known disease.

Conclusion: This uncommon case reveals the possibility of the localization of malignant cells within bone metaplasia of intraocular ossification in an enucleated blind painful eye. From a practical point of view, a careful systematic histopathological examination of all resected tissues in patients with a history of malignant neoplastic pathology is necessary to confirm the diagnosis and exclude occult malignancies.

Keywords: Intraocular heterotopic ossification, Extramedullary hematopoiesis, Small lymphocytic lymphoma

Background

The presence of bone marrow within heterotopic ossification (HO) has been reported only a few times in the literature, and reports of finding hematological malignancies within the same bone marrow are even rarer. This uncommon case reveals the possibility of localization of malignant cells within bone metaplasia and we want to highlight the importance of a systematic histopathological examination of all resected tissue

in patients with a history of malignant neoplastic pathology.

Case presentation

We report a case of true trilineage hematopoiesis in an excised area of HO from an enucleated blind painful eye.

A 70-year-old Caucasian man presented with a blind painful right eye to our ophthalmology department to evaluate enucleation bulbi. He had a history of a blunt trauma injury to his right eye that occurred 49 years ago, and he subsequently experienced hyphema, vitreous hemorrhages, and traumatic cataract. Over the past 10 years, he experienced episodes of ocular pain phthisis

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bulbi associated with trigeminal neuralgia. A slit lamp examination of his right eye showed band keratopathy and seclusion pupillae, with a brunescant traumatic cataract. A fundoscopic examination of his right eye was not executable due to media opacity. His left eye was normal without any kind of lesions and had an uncorrected visual acuity (UCVA) of 20/20. A right eye ultrasound B-scan examination showed a phthisic eye, with complete retinal detachment, and hyperechogenic tissues with an acoustic shadowing due to calcification projected into the orbital tissue. For that reason, the clinicians decided to perform the enucleation of his right eye. His past medical history was positive for asymptomatic lymphoplasmacytic lymphoma associated with immunoglobulin M (IgM) monoclonal peak diagnosed 12 years before enucleation. At the onset, neither lymphadenopathies nor hepatosplenomegaly were described, and 20% bone marrow infiltration was documented. Our patient was periodically followed up without any treatment with evidence of a slow progressive disease, which did not require treatment up until now. Prior to the

enucleation, magnetic resonance imaging (MRI) of his brain was performed to study a possible trigeminal neuralgia and was normal without any cerebral lesions.

The eyeball was removed and marked fibrosis with places of osseous metamorphosis was noticed macroscopically. A histopathologic examination revealed diffusive fibrotic and calcified uveo-scleral flaps, with widespread bone metaplasia with hematopoietic marrow, mixed with retinal fragments with atrophic areas alternating with hyperplastic aspects and blood clots (Fig. 1a).

A further typing showed the presence of intertrabecular infiltration in the metaplastic bone marrow of non-Hodgkin B lymphoma, with small lymphocytes, with similar characteristics to the already known disease. Immunostaining was positive for CD20, CD3, CD10, CD43, CD23, CD138, S100 GFAP, MelanA, and Ki-67 (Fig. 1b-c).

Discussion

Heterotopic bone formation, also known as HO, is the unusual growth of bone outside the skeleton [1].

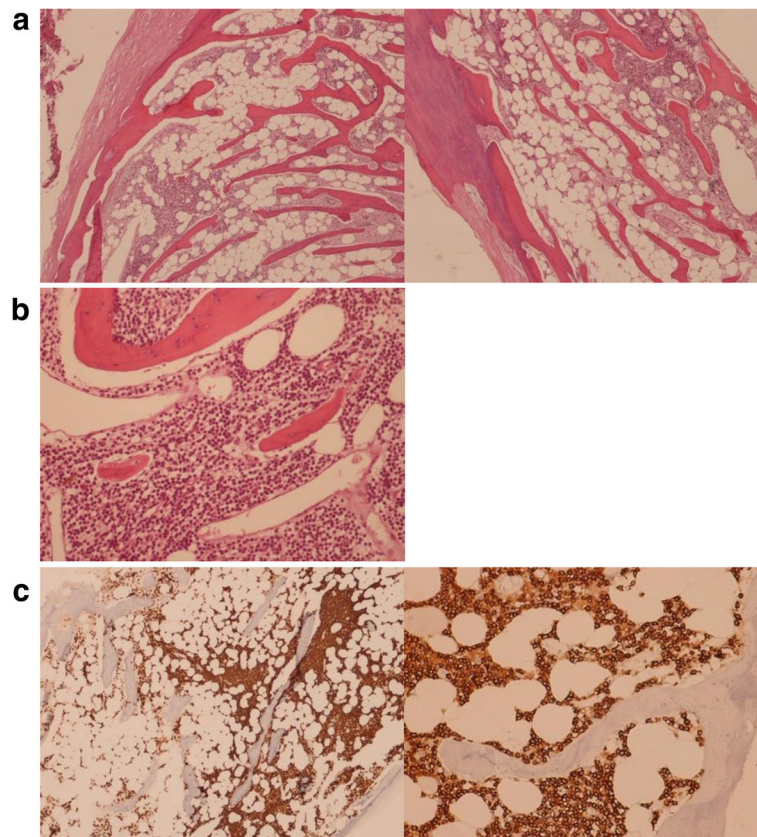


Fig. 1 **a** Calcified and ossified sclera flap, with bone trabeculae and intertrabecular spaces inhabited by adipose and hematopoietic medullary elements. There are areas more densely cellulated and occupied by small round cells with little lymphoid-looking cytoplasm (EE= Hematoxylin and Eosin (H&E) $\times 10$ after decalcification treatment). **b** Homogeneous, small-sized lymphoid cells occupying the entire intertrabecular space (EE= Hematoxylin and Eosin (H&E) $\times 40$ after decalcification treatment). **c** Immunohistochemical staining with CD20 demonstrates the B lymphoid differentiation of the neoplastic population, occupying the medullary intertrabecular spaces of the newly formed metaplastic bone

Heterotopic secondary ossification is usually seen in structures, such as muscles and tissues adjacent to the bone, after musculoskeletal injury or central nervous system or spinal cord trauma [1]. Less commonly encountered sites of heterotopic secondary ossification are in the mesentery, gastrointestinal tract, abdominal incisions and wounds, the walls of blood vessels, the kidneys, the uterus, and the eye [2, 3].

Intraocular ossification is a rare type of metaplasia that can occur after long-standing retinal detachment, some intraocular tumors, chronic inflammation, or eyeball trauma [4]. The incidence of intraocular ossification described in the literature of studies performed on enucleated eyes is up to 18%; however, there are unpublished studies that report an occurrence rate higher than 38% [5, 6]. This condition tends to develop very slowly. Choroidal ossification could be histopathologically traced approximately a year after a traumatic event, whereas it needs 10–20 years to be radiologically identifiable [7, 8].

The pathogenic mechanism underlying intraocular ossification is not completely understood [5, 6, 9]. It seems that the base of intraocular bone formation is metaplastic retinal pigment epithelium (RPE) cells, which after a traumatic and inflammatory stimulus undergo osteoblastic and fibroblastic differentiation. This hypothesis is supported by the frequent observation of islands of RPE cells trapped in the newly formed bone [10].

The presence of bone marrow within HO has been reported only a handful of times in the literature; moreover, the finding of hematological malignancies within the same marrow has been described a few times, as in the case of the formation of myeloma found inside a heterotopic bone marrow in the aortic wall, and in bone metaplasia of a surgical scar [11–13]. This is possibly the first description of true trilineage hematological malignancy in intraocular HO in the literature.

Small lymphocytic lymphoma (SLL) is a non-Hodgkin lymphoma affecting the B lymphocytes of the immune system [14]. SLL often involves the bone marrow, which is why cancer cells have been found within intraocular ossification containing true hematopoietic tissue [15].

Conclusions

This rare case reveals the possibility of localization of malignant cells in true trilineage hematopoietic tissue within HO in an enucleated blind painful eye. In managing a painful blind eye, we must subject all enucleated specimens to a systematic histopathological examination, to confirm the diagnosis and exclude a hidden intraocular malignancy.

Abbreviations

SLL: Small lymphocytic lymphoma; HO: Heterotopic ossification; RPE: Retinal pigment epithelium

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Not applicable.

Authors' contributions

AB and AD contributed to conception and design. SM, MB, and PV contributed to data acquisition. All authors contributed to interpretation of data; all authors drafted the article and approved its final version.

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Availability of data and materials

All data supporting our findings are provided in the manuscript.

Ethics approval and consent to participate

The local ethics committee ruled that no formal ethics approval was required in this particular case.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal. The patient consented to the submission of the case report to the journal.

Competing interests

All other authors have no financial relationships to disclose. The authors declare that they have no competing interests.

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