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Original Article

Balloon cell nevus of the iris

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ABSTRACT

Balloon cell nevus is a rare histopathological lesion characterized by a predominance of large, vesicular and clear cells, called balloon cells. There is only 1 case of balloon cell nevus of the iris reported in the literature.

Case report: A 55 year-old man presented a pigmented elevated lesion in the right iris since the age of 12 years old. The lesion had been growing for the past 2 years and excision was performed. Histopathological examination showed a balloon cell nevus composed of clear and vacuolated cells without atypia. A typical spindle cell nevus of the iris was also observed. The differential diagnosis included xanthomatous lesions, brown adipocyte or other adipocytic lesions, clear cell hidradenoma, metastatic clear cell carcinoma of the kidney and clear cell sarcoma. The tumor was positive for Melan A, S100 protein and HMB45.

Conclusion: Balloon cell nevus of the iris is rare but should be considered in the differential diagnosis of melanocytic lesions of the iris.

Introduction

Balloon cell nevus is a rare histopathological lesion characterized by predominantly large, vesicular and clear cells termed 'balloon cells'. In general, the balloon cell nevus is easily recognizable histopathologically; however, it may be mistaken for a xanthomatous lesion, adipocytic lesion (including brown fat), clear cell hidradenoma, metastatic clear cell carcinoma of the kidney or clear cell sarcoma [1]. Importantly, balloon cell nevus must be differentiated from balloon cell melanoma. It is a well-recognized dermatopathological entity which accounts for less than two percent of cutaneous nevi [2]. Rare cases of balloon cell nevus of the conjunctiva have been described; however, it is very rare in the iris, with only one reported case in the literature.

Case report

A 55-year-old man presented with a longstanding history of a pigmented, elevated lesion of the right iris which had been present since 12 years of age. He reported an increase in the size of the lesion over the preceding two years. The patient was otherwise healthy with no relevant past medical history. Regular visits to his ophthalmologist over the previous six months demonstrated a slight increase in the size of the lesion (Fig. 1). On examination, the visual acuity of the right eye (OD) was 6/6 (corrected with glasses) and of the left eye (OS) was 6/18. The intraocular pressure was 17 OD and 12 OS. Slit lamp examination showed a pigmented iris lesion (OD) with antero-inferior synechia leading to angle closure at the bottom. The clinical differential diagnoses included Iridocorneal Endothelial Syndrome (ICE) versus malignant melanoma and nevus. An excisional biopsy was performed to better determine his correct diagnosis.

Histopathological examination showed a tumor composed of sheets of polyhedral cells with well-defined cell borders dispersed within a background stroma and lacking any glandular or nested arrangement. The lesional cells contained clear cytoplasm, centrally placed, small to medium-sized nuclei with smooth nuclear borders and inconspicuous nucleoli. Mitotic figures, pleomorphism and severe atypia were not identified. The anterior aspect of the tumor showed an area of fusiform cells with bland, small nuclei and minimal eosinophilic cytoplasm. This area also displayed no evidence of mitoses or necrosis. The surgical margins were positive for tumor involvement. Immunohistochemical studies showed strong and diffuse positivity for S-100 and Melan-A, weak and focal

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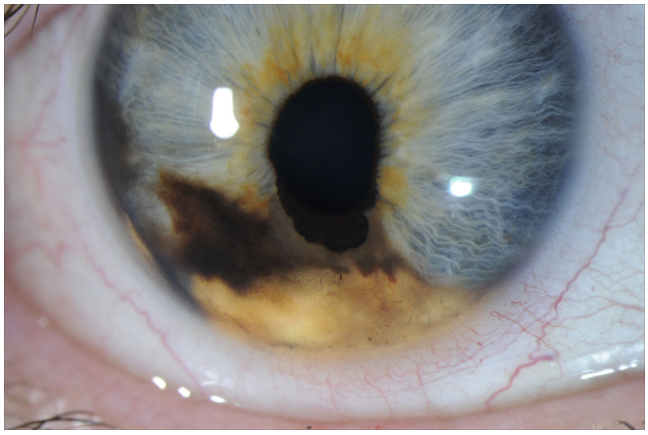

Fig. 1. Clinical picture showing the pigmented lesion located at the inferior aspect of the iris. The lesion presented darkens and lighter pigmented areas with irregular borders.

positivity for HMB-45, and negativity for CD68, CD1a, AE1AE3, CD10, Factor VIII, Desmin and Actin (Fig. 2). Ki-67 proliferative index marker showed positivity in approximately one percent of lesional cells. The histopathological and immunohistochemical findings supported a final diagnosis of balloon cell nevus with an area of conventional spindle cell nevus. More than one year post excision, the patient's follow-up showed that he is currently without any evidence of recurrence.

Discussion

Balloon cell changes can be seen in approximately 1.7% of all melanocytic lesions. Balloon cell changes of the iris, however, are extremely rare, with only one published case report in the literature [3]. In the vicinity of the ocular region, this phenomenon is not so rare and is reported in up to four percent of all nevi of the choroid [4] and in ten percent of all choroidal melanomas [5]. Some cases of balloon cell nevi of the conjunctiva [2] and one case of balloon cell nevus of the caruncle [6] have been described. Table 1 [1,3,4,6–11] describes the clinical features of all cases of balloon cell nevus of the ophthalmic region reported in the English literature.

In cutaneous lesions, balloon cell changes are subdivided into primary and secondary phenomena depending on the percentage of affected cells. When balloon cell changes are seen in more than 50% of lesional cells, it is considered a primary phenomenon and these lesions are called balloon cell nevi or balloon cell melanoma. When balloon cell changes are seen in the minority of lesional cells (<50%) and the lesion has another predominant morphological appearance, it is considered a secondary phenomenon [12]. Approximately 80% of cutaneous balloon cell nevi are described in patients who were 30 years or younger at the time of diagnosis [13,14]. In terms of common anatomical locations for cutaneous balloon cell lesions, they are seen most commonly in the head and neck region, followed by trunk and extremities [14]. Clinically, these lesions usually appear as a smooth papule or small polyp with brown pigmentation.

The pathogenesis of balloon cell nevus is not fully understood; however, it seems to be caused by an arrest in the biosynthesis of melanin within the melanosome and is therefore considered an intrinsic cellular degenerative process [15,16]. Ultrastructural examination shows the balloon cells are formed by vacuolization of melanocytes secondary to enlargement and disintegration of melanosomes. This finding suggests that apoptosis may be involved in the development of this lesion [15]. Interestingly, vacuolization or balloon cell degeneration can be found in uveal melanomas treated by radiation therapy. Messmer et al. [17] found a dose-dependent cytoplasmic vacuolization with balloon cell degeneration more prominent at the base (near the radiation plaque) than the apical portion of the tumor.

Cytologically, balloon cells are characterized by large size, centrally placed small, round, basophilic nuclei with inconspicuous nucleoli and a clear, foamy, well-demarcated cytoplasm [16]. The balloon cell nevus is generally composed of balloon cells in addition to some normal appearing nevus cells, which tend to be found near the periphery of the lesion. In our case, the base of the lesion showed an ordinary iris nevus with small fusiform nuclei and inconspicuous nucleoli. Mitoses are absent in balloon cell nevi and pigment may be absent, sparse or abundant [18]. Certainly, balloon cell nevus may present a particularly difficult and challenging diagnosis in the absence of pigment

The differential diagnoses of a balloon cell nevus include balloon cell melanoma, xanthoma, brown adipocytes, clear cell hidradenoma, metastatic clear cell carcinoma of the kidney and clear cell

Table 1

Age	Gender	Ethnicity	Site	Lesion size (mm)	Duration	Signs/symptoms	Treatment	Recurrence
7 [7]	F	Caucasian	CO, OS	4	12 months	Pigmented lesion increasing in size, no other symptoms	EB	None
11 [1]	F	Caucasian	CO, OS	<5	3 weeks	Slightly elevated, movable, tan-yellow nodule with a deep brown area	EB	NS
19 [8]	NS	NS	CO, OD	2.5	6 years	Slightly pigmented, prominent, movable tumor	EB	NS
19 [8]	NS	NS	CO, OS	3	NS	Brownish pigmented, well-defined tumor	EB	NS
16 [6]	F	NS	caruncle, OS	0.4	NS	Brown, cystic appearing lesion	EB	NS
39 [9]	F	Caucasian	CO, OS	6–8	27 years	A slightly elevated, plaque-like lesion (age 11) with multiple recurrences	Multiple EB	Multiple recurrences
6 [11]	F	Indian	CO, OD	4	Present since birth	Well defined, slightly elevated, brownish, movable plaque	EB	None at 6 months
44 [10]	F	Caucasian	CO, OD	4	NS	Asymptomatic pigmented lesion	EB	NS
56 [3]	F	NS	Iris, OS	2.5	2 years	Light gray enlarging tumor.	EB	NS
55[a]	M	Caucasian	Iris, OD	5	43 years	Pigmented elevated lesion	EB	None at 1 year

4 cases of balloon cell nevi of choroid and ciliary body with no other specific details [4].
F, female; NS, not stated; CO, conjunctiva; OS, left eye; OD, right eye; EB, excisional biopsy.
[a] Current case.