Caruncular Oncocytoma Mimicking Malignant Melanoma

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Established Facts

- Oncocytoma generally appears as a dark blue or reddish orange mass in the caruncle.
- Definitive diagnosis of oncocytoma requires histopathologic evaluation.

Novel Insights

- Oncocytoma can mimick malignant melanoma.
- Ultrasound biomicroscopy is helpful in identifying cysts in caruncular tumors, which suggests a benign process.

Keywords

Eye · Tumor · Caruncle · Conjunctiva · Oncocytoma · Melanoma · Ultrasound biomicroscopy

Abstract

Purpose: To report a case of pigmented caruncular oncocytoma that simulated malignant melanoma and discuss the associated ultrasonographic and pathologic features.

Method: Case report. **Results:** An 81-year-old female presented with a painless caruncular mass with a smooth brown surface suspicious for melanoma. Ultrasound biomi-

croscopy revealed a round mass with a large central cavity, more suggestive of a cystic rather than solid lesion. Following complete surgical resection, histopathology revealed a cystadenomatous lesion composed of bland cells with copious eosinophilic cytoplasm consistent with oncocytoma that had a central blood-filled cavity. **Conclusions:** Oncocytoma is a benign tumor that can appear pigmented clinically and resemble melanoma. The definitive diagnosis requires histopathologic evaluation. Oncocytoma should be considered in the differential diagnosis of a pigmented caruncular mass.

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Fig. 1. An 81-year-old woman with a darkly pigmented well-circumscribed caruncular mass (a) noted on slit lamp to be subepithelial (b). c Ultrasound biomicroscopy demonstrated multilobulated cavities.

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Fig. 2. Histopathology of the resected mass demonstrated a predominantly cystic mass (a) with the tumor consisting of a solid component interposed with multiple cysts filled with a mixture of proteinaceous fluid and blood (b). c This cellular pattern demonstrated a papillary proliferation of non-pigmented glandular epithelial cells and the cytoplasm appeared granular and eosinophilic (d), consistent with oncocytoma (hematoxylin-eosin-stained sections, original magnification $\times 25$, 100, 250, 400).

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Introduction

Oncocytoma is a rare, benign neoplasm of glandular epithelial or subepithelial cells that have copious quantities of finely granular, eosinophilic cytoplasm and paracentral nuclei [1–3]. This tumor is commonly found in the lacrimal and salivary glands [1]. Oncocytoma of the lacrimal sac was first described by Radnót in 1941 [3]. Other affected structures in the ocular adnexa include the caruncle and rarely the bulbar conjunctiva and plica semilunaris [4]. The estimated incidence of periocular oncocytoma is 0.3 per million per year [4]. This condition is typically unilateral and affects the elderly population [1, 4, 5].

Clinically, oncocytoma appears as a dark blue or reddish orange mass in the caruncular region with a smooth surface and occasional intralesional cavities [1, 2]. In a review of 15 oncocytic lesions of the ocular adnexa from our department, all cases were unilateral, and the tumor resided in the caruncle (86%), bulbar conjunctiva (7%), and plica semilunaris (7%) [4]. In that series, the oncocytoma clinically simulated lymphoma, inclusion cyst,

pigmented nevus, and sebaceous hyperplasia [4]. Herein we report a brown caruncular oncocytoma that was referred with the diagnosis of possible malignant melanoma.

Case Report

An 81-year-old Caucasian woman was referred for evaluation of a painless pigmented caruncular lesion of the right eye (OD) that was noted 3 weeks prior to presentation and was suspicious for melanoma. She denied discharge, bleeding, growth, or change in lesion color.

On examination, best-corrected visual acuity was 20/30 OD and 20/40 in the left eye (OS). Intraocular pressures were 17 mm Hg OD and 15 mm Hg OS. There was no evidence of tumor OS. Evaluation OD disclosed a darkly pigmented brown-blue subepithelial caruncular mass (Fig. 1a, b). The smooth, dome-shaped mass measured 5 mm in basal diameter. There were no feeder vessels, orbital extension, or primary acquired melanosis. Funduscopically, OD was normal. Ultrasound biomicroscopy (UBM) of the mass disclosed multiple intratumoral cavities, suggesting a cystic rather than a solid mass (Fig. 1c). These features were more consistent with cystic caruncular oncocytoma rather than nevus or melanoma.

Excisional biopsy, using a “no touch” technique, was performed. Histopathologic evaluation revealed a microscopically non-pigmented cystadenomatous lesion with a prominent cavitory component (Fig. 2a, b). The tumor was composed of a papillary proliferation of bland epithelial cells with copious eosinophilic cytoplasm (Fig. 2c, d). The lumen of the cystadenoma was filled with a mixture of proteinaceous fluid and blood. The final diagnosis was caruncular oncocytoma with a cystadenomatous growth pattern. Following surgery, the site was well healed without recurrence.

Discussion

The caruncle is a small, pink, nodular-shaped island of skin surrounded by conjunctiva located near the medial canthus nasal to the plica semilunaris. Histologically, the surface of the caruncle is capped by keratinized epithelium that is continuous with non-keratinized conjunctival epithelium on its sides. The caruncle uniquely harbors skin components including pilosebaceous units with fine vellus hairs, sweat glands, and the accessory lacrimal glands of Popoff, that can spawn a diversity of lesions [1–7]. Oncocytes are large epithelial cells that arise from glandular ducts and contain copious quantities of granular eosinophilic cytoplasm, filled with numerous mitochondria [1, 3]. Overgrowth of these cells in an adenomatous pattern in a partially or completely encapsulated manner is described as oncocytoma and can be found in several organs including kidney, thyroid gland, salivary glands, and the ocular adnexa [4].

Most caruncular tumors are benign (95%) [5–8]. Levy et al. [5] and Luthra et al. [6], in a report of 42 and 112 caruncular lesions, respectively, found nevus (60 and 43%) to be the most common, while Shields et al. [7], in an analysis of 57 caruncular tumors, found papilloma (32%) more commonly than nevus (24%). In a more recent analysis of 5,002 conjunctival tumors, of which 218 originated in the caruncle, the array of caruncular tumors included nevus (50%), papilloma (9%), melanoma (6%), lymphoma (5%), primary acquired melanosis (4%), and others (26%) [8]. In this large study, oncocytoma represented only 1.8% of caruncular tumors [8], in contrast to 7.1% [5], 3.6% [6], and 3.5% [7] as previously reported.

The caruncle is the most frequent location of oncocytoma affecting the ocular adnexa [4, 5, 9]. Histopathologic features and cytokeratin immunoreactivity suggest that caruncular oncocytoma arises from the accessory lacrimal glands of Popoff [10, 11]. Based on a literature review of 127 published cases, caruncular oncocytoma showed a mean basal diameter of 5 mm and a mean thickness of 5 mm [4]. Given its small size and location, caruncular on-

cocytoma rarely affects visual acuity. Classically, it presents as a gradually enlarging, painless blue, red, or brown mass in an elderly patient [1, 5, 9, 12, 13]. Of the 36 cases in which oncocytoma coloration was reported, 47% were described as orange-red, 19% dark blue, 19% tan-yellow, and 14% reddish-brown [4]. The differential diagnosis of pigmented caruncular mass includes caruncular nevus, melanoma, melanosis, oncocytoma, hemorrhage, and inclusion cyst [4, 14]. Regarding melanoma, caruncular involvement is a predictor of poor prognosis, so the presence of a large darkly pigmented mass in the ocular adnexa should warrant suspicion for malignant melanoma [5, 15].

Caruncular oncocytoma can manifest as a solid, partially cystic, or completely cystic mass [4, 16]. The acoustic features on UBM can help differentiate solid from cystic manifestations. UBM of four patients with caruncular oncocytoma disclosed three with mixed solid and cystic features, and one with purely cystic appearance [4]. In contrast, malignant melanoma is generally solid without cavitory or cystic findings. Cyst-like cavities can occur within benign and malignant intraocular tumors including uveal melanoma [17], retinoblastoma [18], uveal metastasis [19], and retinal astrocytic hamartoma [20]. Furthermore, cystic lesions of the eyelid skin with a blue pigmented appearance such as apocrine hidrocystoma can resemble a blue nevus or melanoma [21]. Cavities can be seen in orbital tumors such as schwannoma [22], rhabdomyosarcoma [23], and necrotic melanoma [24]. Regarding conjunctival melanoma, a cavitory appearance has not been documented, so this feature in our case is strongly suggestive of an alternative diagnosis.

Histopathologic features of oncocytoma include oxyphilic or eosinophilic cells organized in sheets as the solid portion of the mass, and occasionally eosinophilic fluid-filled spaces representing the cystic portion [12]. The solid, cellular portion is composed of epithelial cells filled with granular eosinophilic cytoplasm reflecting the presence of myriad mitochondria, whereas the cystic portion is filled with proteinaceous fluid and occasionally blood. The pigmented appearance has been presumed to arise from dense concretions within the tumor, rather than intracellularly [14]. In this case, the copious cystic portion was likely responsible for the macroscopic appearance that mimicked melanoma. Although oncocytic carcinomas have been reported, cellular atypia is rare [12]. Immunohistochemistry usually is not necessary to make the diagnosis but can be helpful in differentiating oncocytoma from melanoma. Melanoma typically is immunoreactive for S-100 protein and HMB-45, but oncocytoma is not [12, 25]. Treatment outcomes following complete ex-

cision of the oncocytoma are usually excellent. Though unlikely, the presence of tumor recurrence warrants suspicion for oncocytic adenocarcinoma [13].

In conclusion, oncocytoma is a rare tumor but should be included in the differential diagnosis of a pigmented caruncular lesion especially in an older adult. Slit-lamp examination alone may not suffice to differentiate an oncocytoma with intralesional hemorrhage from a melanocytic melanoma. UBM can disclose intratumoral cavities suggesting that the process is benign. The definitive diagnosis of oncocytoma is confirmed by histopathologic evaluation.

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Statement of Ethics

Our case report complies with all guidelines for human studies and animal welfare regulations. The patient has given informed consent. Our institute's committee on human research has approved the study's protocol. Our case study does not include any animal experimentation.

Disclosure Statement

The funders had no role in the design and conduct of the study, in the collection, analysis, and interpretation of the data, or in the preparation, review, or approval of the manuscript. Carol L. Shields, MD, has had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. No conflicting relationship exists for any author.