Ultrasound Biomicroscopy of Cystic and Solid Caruncular Oncocytoma

Two patients had an asymptomatic, circumscribed, bluish caruncular mass that appeared cystic clinically and was suspected to represent oncocytoa. In both cases, ultrasound biomicroscopy (UBM) revealed a relatively echolucent circumscribed mass with fine internal echoes suggestive of a cystic mass. Following complete carunculectomy, histopathologic findings disclosed a cystic oncocytoa in 1 case that correlated with the cystic findings on UBM. The second lesion was a more solid cystadenomatous oncocytoa that correlated with size on UBM but was not cystic as suggested by UBM. Ultrasound biomicroscopy can be a useful technique for delineating the configuration and extent of tumors in the caruncular region, but both solid and cystic tumors can appear echolucent on UBM.

Oncocytoma is a benign epithelial tumor that arises from glandular structures in the salivary, thyroid, parathyroid, and lacrimal glands. Oncocytic tumors arise predominantly from accessory lacrimal glands in the caruncle or rarely in the main lacrimal gland, lacrimal sac, or accessory lacrimal glands of the fornical conjunctiva. Oncocytoma of the caruncle typically appears bluish in color and shows either a cystic or solid configuration. Prior to the development of UBM, there was no reliable imaging modality to assess the configuration, depth, and internal consistency of caruncular tumors. Ultrasound biomicroscopy is a noninvasive diagnostic technique that offers high-resolution imaging to a fraction of a millimeter. It is used predominantly for anterior segment disorders of the eye. In this article, we report 2 caruncular oncocytoas studied with UBM, and we show that the tissue configuration on UBM correlates with histopathologic findings but that the internal lucency can be misleading.

Report of Cases. Case 1. A 73-year-old woman noticed a blue spot in the inner side of her right eye for several months. Ocular examination showed a small, round, subepithelial, bluish mass measuring 4 mm in diameter deep in the caruncle of her right eye (Figure 1A). Ultrasound biomicroscopy disclosed a well-circumscribed echolucent lesion with an echogenic outer wall and fine internal reflectivity, consistent with a caruncular cyst-
tic mass (Figure 1B). The differential diagnosis included inclusion cyst, hemorrhage, cystic oncocytoma, or deep melanoma. Following complete carunculectomy, histopathologic findings disclosed a large cyst surrounded by smaller cysts within the caruncular stroma. The cystic cavities were lined by a dual layer of tall, benign columnar epithelial cells with copious quantities of intensely eosinophilic cytoplasm, consistent with oncocytic differentiation (Figure 1C). The diagnosis was cystic oncocytoma.

Case 2. A 59-year-old man noticed a painless dark spot in the medial canthus of his left eye for 2 months. Ocular examination disclosed a well-circumscribed, round, bluish lesion measuring 6 mm in diameter deep within the caruncle (Figure 2A). Ultrasound biomicroscopy showed a well-defined, round, echolucent structure with fine internal reflectivity and a dense outer wall (Figure 2B). The differential diagnosis included inclusion cyst, hemorrhage, cystic oncocytoma, or deep melanoma. Following complete carunculectomy, histopathologic findings of the excised lesion disclosed a relatively solid cystadenomatous proliferation of bland, benign epithelial cells with copious quantities of intensely eosinophilic cytoplasm, consistent with oncocytic differentiation (Figure 2C). The diagnosis was cystadenomatous oncocytoma.

Comment. The caruncle is located in the medial canthus and is composed of tissues from both skin and conjunctiva. Its apical surface is lined by stratified squamous epithelium with appendages consisting of several glandular structures, including pilosebaceous glands, sweat glands, and accessory lacrimal glands. Oncocytomas of the caruncle are thought to arise from the accessory lacrimal glands.

Oncocytoma of the caruncle is relatively uncommon and accounts for up to 8% of biopsied caruncular lesions. It is a painless, slow-growing nodule that is a red, blue, or brown, is solid or cystic in morphology, and can be mistaken for hemangioma, cyst, nevus, or melanoma. It most commonly occurs in elderly individuals and probably represents an age-related metaplastic change of the glandular epithelium. Its constituent cells have copious quantities of eosinophilic cytoplasm that contains numerous mitochondria.

Ultrasound biomicroscopy is an ultrasound imaging technique that uses frequencies in the 50- to 100-MHz range to produce high-resolution images of small segments of the body. This technique has been most often used for imaging of the cornea and anterior chamber of the eye. Others have investigated its value for scleral invasion of conjunctival tumors and malignancies. In this article, we used UBM to assess the size, configuration, and internal tissue qualities of caruncular tumors. In our 2 cases, UBM was useful in delineating the extent and configuration of the tumors and provided important information regarding tumor depth. However, UBM was misleading in suggesting that both tumors were cystic based on echolucency. We found that the oncocytoma in case 1 was indeed cystic and correlated well with the UBM findings whereas the lesion in case

Figure 2. A 59-year-old man had solid caruncular cystadenoma. A, The mass appeared as a deep blue lesion. B, Ultrasound biomicroscopy showed a circumscribed echolucent mass. C, Histopathologic findings revealed a benign cystadenomatous oncocytoma composed of tall cells with abundant eosinophilic cytoplasm (hematoxylin-and-eosin, original magnification ×25). Inset, Oncocytic differentiation of the bland epithelial cells is evident (hematoxylin-and-eosin, original magnification ×100).
2 was relatively solid but appeared hollow ultrasonographically. We advise that UBM be used for assessment of caruncular tumors, as it provides high-resolution imaging to submillimeter levels and can delineate tumor extent and configuration. However, we caution that both cystic and densely packed solid tumors can appear echoluent.

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**Choroidal Neovascularization After Epiretinal Membrane Removal**

Surgical removal of an epiretinal membrane (ERM) is a relatively common procedure, often resulting in significant visual improvement. Several complications, however, are well recognized, and include cataract formation, retinal breaks and detachments, cystoid macular edema, retinal phototoxicity, and endophthalmitis.1 Choroidal neovascularization (CNV) is a rare complication of ERM surgery, and, to our knowledge, only 3 cases have been reported in the literature.2-4 We report 3 additional cases of CNV after surgical removal of idiopathic macular pucker, and comment on the literature regarding this entity.

**Report of Cases. Case 1.** A 47-year-old man complained of increasing metamorphopsia in his left eye for 3 years. His ophthalmic history was notable for myopia of 7.75 diopters, cataract surgery in his left eye at the age of 40 years, and a small retinal tear in the nasal periphery in the left eye treated with a laser. His visual acuity (VA) was 20/60 OS, and the result of a fundus examination revealed a macular pucker (Figure 1A). Examination results were unremarkable in the right eye. The patient underwent pars plana vitrectomy and an uncomplicated ERM peel using fine forceps.

Four weeks postoperatively, the patient reported a central scotoma and blurred vision. Eight weeks postoperatively, his VA decreased to 20/800 OS and juxtapfoveal CNV was noted on fundus examination and fluorescein angiography (FA) (Figure 1B). Seven weeks later, a focal intraretinal hemorrhage was seen inferior to the fovea. One month postoperatively, the patient developed a rhegmatogenous retinal detachment requiring vitrectomy and silicone oil placement; his VA 2 years later was 20/500 OS.

**Case 2.** A 77-year-old man complained of decreased VA in his right eye for 2 years. His VA was 20/80 OD. The results of an ophthalmic examination revealed cataracts in both eyes, a mild ERM in his left eye, and an ERM associated with cystic retinal changes in his right eye. The patient underwent uncomplicated pars plana vitrectomy and an ERM peel in his right eye using Tano forceps (Synergetics Inc, Wilsonville, Ore). A trace intraretinal hemorrhage was noted inferotemporal to the fovea postoperatively.

Four weeks postoperatively, the patient’s VA improved to 20/50 OD. Because of a residual intraretinal hemorrhage, FA was performed, revealing no evidence of CNV.

Five months postoperatively, the patient developed metamorphopsia and his VA declined to 20/125 OD. The results of a fundus examination revealed an elevated grayish lesion temporal to the fovea. The FA showed classic extrafoveal CNV that was treated with laser photocoagulation. Three weeks following treatment, his VA was 20/100 OD. The FA showed no evidence of CNV. Seven weeks later, his VA remained stable at 20/100 OD.

**Case 3.** An 80-year-old man complained of deteriorating vision in his left eye 1 month after uneventful cataract extraction and intraocular lens implantation. His ocular history was significant for cataract extraction in his left eye and medically managed glaucoma in both eyes. The result of a fundus examination was unremarkable in his right eye and revealed a macular ERM and cystoid macular edema in his left eye, which was confirmed by FA. Eighteen months after cataract surgery, the cystoid macular edema had resolved; however, the patient’s VA remained poor, at 20/50−3 OD, secondary to the ERM. A pars plana vitrectomy and membrane peel using Tano forceps were performed. Minimal surface bleeding was noted during the procedure; 1 week later, a focal intraretinal hemorrhage was seen nasal to the fovea and a preretinal hemorrhage was seen inferior to the fovea. One month postoperatively, the patient’s VA was 20/200 OS. The FA showed classic extrafoveal CNV that was treated with laser photocoagulation.

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