There are several tumors that can occur in the posterior segment of the eye. They are generally classified based on the main tissue involved such as the choroid, retinal pigment epithelium (RPE), or retina. The spectrum of tumors in each tissue varies. For example, tumors in the choroid include the melanocytic nevus, melanoma, metastasis, cavernous hemangioma, and other less common tumors such as lymphoma, neurilemoma, leiomyoma, and osteoma.

Lesions of the RPE include congenital hypertrophy, congenital simple hamartoma, combined hamartoma, reactive hyperplasia, adenoma, and adenocarcinoma. Those affecting the retina include capillary hemangioma, cavernous hemangioma, racemose hemangioma, vasoproliferative tumor, astrocytic hamartoma, and retinoblastoma. The differentiation of these tumors by experienced clinicians is made primarily by indirect ophthalmoscopy. Ancillary testing with intravenous fluorescein angiography, indocyanine green angiography, ultrasoundography, optical coherence tomography (OCT), color Doppler testing, magnetic resonance imaging, computed tomography, and fine-needle aspiration biopsy can assist in confirming the diagnosis. This chapter presents the OCT findings of selected intraocular tumors.

Optical coherence tomography provides cross-sectional imaging of the retina and RPE primarily, and deeper tissues, including the choroid and sclera, show poorer resolution. With this in mind, OCT of retinal and RPE tumors shows good resolution, whereas OCT of choroidal tumors shows only superficial information of the choroidal tumor, but more extensive information of the overlying retina and RPE.

Choroidal Tumors

Choroidal Nevus

Choroidal melanocytic nevus is a benign tumor that is seen with increasing frequency in the latter decades of life. It is estimated that between 4% and 6% of Caucasians manifest a uveal nevus. It can occur in the iris, ciliary body, or choroid, and is most frequent in the posterior choroid. Choroidal nevus varies in size from a fraction of a millimeter to several millimeters in the base. The degree of pigmentation can extend from dark brown to slate gray to completely yellow, or it can be amelanotic. The shape of a choroidal nevus is generally round to oval, and it usually manifests smooth regular margins, but slightly irregular margins can be found. Overlying degenerative changes of the retina and RPE can occur, with the most common being drusen, retinal pigment epithelial atrophy and hyperplasia, and clumped orange pigment. Less commonly, subretinal neovascularization and serous and hemorrhagic detachments of the retina and RPE can occur. Most choroidal nevi are less than 2 mm in thickness. It is often difficult to differentiate those nevi that are near 2 mm in thickness from small choroidal melanoma. The following risk factors predictive of small melanoma have been identified: (1) tumor thickness greater than 2 mm; (2) overlying orange pigment; (3) associated subretinal fluid; (4) symptoms of flashes, floaters, or blurred vision; and (5) location of the mass at the optic disc. The presence of three or more of these five risk factors imparts greater than 50% risk that the tumor will grow, a sign of malignant melanoma.

In general, a choroidal nevus is poorly imaged on OCT due to its location deep in the choroid; however, the overlying retina can show several alterations. In an assessment of 120 eyes with choroidal nevus using OCT, Shields and coworkers found related retinal findings that included overlying retina edema (15%), subretinal fluid (26%), retinal thinning (22%), drusen (41%), and RPE detachment (12%) (Figs. 20.1 to 20.3). Furthermore, OCT permitted classification of the overlying retinal edema as focal cystoid (3%), diffuse cystoid (8%), coalescent cystoid (3%), and noncystoid edema (1%). On OCT, the overlying retina was normal thickness (32%), thinned (22%), or thickened (45%), and photoreceptor loss or attenuation was noted in 51% of cases. Specific OCT findings of the choroidal nevus were limited to its anterior surface with minimal information deeper within the mass. These findings included increased thickness of the RPE/choriocapillaris layer (68%) and optical qualities within the anterior portion of the nevus of hyporeflectivity (62%), isoreflectivity (29%),...
Fig. 20.1. Choroidal nevus. (A) Pigmented choroidal nevus displays overlying drusen. (B) Optical coherence tomography (OCT) shows thickening and hyperreflectivity of the retinal pigment epithelium (RPE)/choriocapillaris layer and hyporeflectivity (optical shadowing) of the choroid at the site of the nevus. Note the subtle multifocal elevations at the level of the RPE/choriocapillaris suggestive of drusen.

Fig. 20.2. Choroidal nevus. (A) Pigmented choroidal nevus shows overlying RPE detachment outlined with subtle orange pigment. (B) Optical coherence tomography shows obvious overlying RPE detachment with debris in the subpigment epithelial space.

Fig. 20.3. Choroidal nevus. (A) Lightly pigmented choroidal nevus displays chronic RPE alterations inferiorly suggestive of resolved subretinal fluid. (B) Optical coherence tomography reveals diffuse cystoid retinal edema over the elevated portion of the nevus and extending into the fovea.