Pigmented Adenoma Mimicking a Juxtapapillary Melanoma

A 20-Year Follow-up

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A 52-year-old white woman was first diagnosed with a tumor of the right optic nerve in 1972. She remained asymptomatic until 1992, when she had a seizure on the left side of her body from a frontoparietal glioblastoma multiforme. Ophthalmic examination revealed enlargement of the eye tumor. This case provides clinical documentation spanning 20 years of a growing, pigmented tumor of the optic nerve head shown histopathologically to be a retinal pigment epithelial adenoma.

Tumors of the retinal pigment epithelium (RPE) are rare intraocular tumors that are often misdiagnosed clinically as other pigmented tumors such as melanomas. In this article, we describe the clinicopathologic correlation of a juxtapapillary RPE adenoma the progression of which was followed for 20 years.

REPORT OF A CASE

An asymptomatic 52-year-old white woman was first examined in November 1972 because of a juxtapapillary tumor of the right eye (Figure 1). At that time her visual acuity was 20/20 OU. After observation during which the tumor remained quiescent, the patient remained asymptomatic for the next 15 years. She was examined in December 1992 at the ophthalmology service at Northwestern University Medical School, Chicago, Ill, after having a seizure involving the left side of her body. She had a visual acuity of 20/30+ OU and no afferent pupillary defect. On fundus examination, a tumor of the right optic nerve head was identified (Figure 2). The tumor was moderately pigmented, but not jet black, and it had invaded the superior disc. Some vessels coursing from the nerve were obscured and others were sheathed (Figure 2). The tumor had increased in size moderately since 1972. A fluorescein angiogram (Figure 3 and Figure 4) revealed early blocked fluorescence. Dilated vessels on the surface of the lesion leaked fluorescein. The optic nerve head stained intensely in the late views. Following an evaluation of the seizure, the patient underwent a right craniotomy for resection of a frontoparietal glioblastoma multiforme. The patient died as a result of the brain tumor and the right eye was obtained for histopathologic investigation.

PATHOLOGIC EXAMINATION

On microscopic examination, the normal, cuboidal cells of the RPE had changed to somewhat flattened, more heavily pigmented cells. These cells infiltrated and replaced the overlying retina and infiltrated and distorted the optic nerve anterior to the lamina cribrosa. The cells also invaded the choroid adjacent to the optic nerve (Figure 5). The tumor consisted of numerous, branching tubes lined by retinal pigment epithelial cells with large, ovoid melanin granules. In many areas, the tubular structures were well formed, while in other areas the proliferating cells had the appearance of linear strands, focal accumulations, and independent cells embedded in an eosinophilic stroma (Figure 6). These proliferating retinal pigment epithelial cells...
Figure 1. Fundus photograph, 1972, shows a brown tumor at the optic nerve head. Some invasion of the optic nerve head is apparent. Retinal arterial sheathing is present.

Figure 2. Fundus photograph, 1992, shows a substantial increase in tumor size. Note that this photograph has lower magnification than Figure 1. Clear extension is seen superiorly and invasion of the optic nerve head is apparent.

Figure 3. Fluorescein angiogram, 1992, shows early hypofluorescence from the pigmented tumor. The retinal vessels on the surface of the tumor are dilated and leak fluorescein.

Figure 4. Some leakage into the tumor is seen, and substantial leakage of the inferior optic nerve head is apparent.

Figure 5. Low-magnification photomicrograph in the region of the optic nerve head. The tumor is anterior to the lamina cribrosa replacing the optic disc. There is a transition from normal retinal pigment epithelium to pigmented tumor cells at the left side of the figure (periodic acid–Schiff, original magnification ×10).

Figure 6. Photomicrograph shows tubular structures lined by pigmented tumor cells and cords of deeply pigmented tumor cells (hematoxylin-eosin, original magnification ×100).
elaborated periodic acid–Schiff–positive material (Figure 5). The lamina cribrosa was undisturbed and the retrolaminar optic nerve was somewhat atrophic and gliotic. Embedded deep within the mass, but anterior to the lamina cribrosa, were fairly large, nonlaminated calcium deposits (Figure 5). Tumor cells extended from the main mass into the choroid and overlying retina without extraretinal extension. The tumor was not particularly rich in vascular channels and the vessels of the involved portion of the optic nerve and retina appeared normal. Bleached sections revealed minimal nuclear pleomorphism and an occasional nucleolus. The tumor was diagnosed histopathologically as an RPE adenoma involving the choroid, optic nerve anterior to the lamina cribrosa, and overlying retina with focal calcific degeneration.

**COMMENT**

There are several pigmented tumors at the optic nerve head that should be considered in the differential diagnosis, including melanocytoma, choroidal melanoma, tumors of the RPE, and hyperplasia. Primary melanomas of the optic nerve are extremely rare, although we have reported a case that simulated a melanocytoma. \(^1\) Melanocytomas are the most common pigmented tumors at the optic nerve head. The RPE has a remarkable ability to respond to changes in intraocular homeostasis. After ocular trauma, inflammation, hemorrhage, or neoplasia, the RPE can undergo hyperplasia. Our patient did not have a history of ocular trauma or inflammation. Often, hyperplasias are more deeply pigmented and the margins of the reactive process are more irregular than choroidal melanomas. \(^2\)

Histopathological examination of RPE adenomas should reveal an abrupt transition between normal RPE and the tumor, as was seen in this case. Adenocarcinomas are often difficult to distinguish from adenomas histologically and may be impossible to distinguish from adenomas on clinical examination. Extracelular extension of adenocarcinomas may not occur, making this distinction academic. \(^3\) Unlike RPE adenocarcinomas, our cytologic examination did not reveal mitotic activity or numerous nucleoli, although the nuclei were somewhat pleomorphic. A diagnosis of reactive hyperplasia may be somewhat more difficult to exclude pathologically. Invasion of the neurosensory retina or invasion into the choroid combined with a history lacking in both ocular trauma and ocular inflammation supports a diagnosis of RPE adenoma and not reactive hyperplasia.

**REFERENCES**


**A look at the past . . .**

\textbf{V} \textit{AN DUYSE AND VAN SCHEVENSTEEN} observed, in the person of a farmer aged fifty-four, a leucosarcoma involving the greater part of the inner half of the iris, extending to the iris angle, touching the cornea, uniformly red, pervaded with vessels, and entirely free from pigment. There were no signs of inflammation, but the tension was increased. The authors discuss the clinical differentiation of this from other forms of tumor of the iris. No pigment was found in the tumor, which proved to be a spindle-celled sarcoma arising from the adventitia of the vessels. The region of Schlemm’s canal, a portion of the ciliary body, and the anterior portion of the suprachoroidal space were involved; the lens was atrophic and compressed; and the detached retina had undergone cystic degeneration. Leucosarcoma of the iris is four times as rare as melanosarcoma. Both lead to metastases less frequently than sarcoma of the choroid, because recognized and removed earlier than the latter.