necrosis (asterisk) (hematoxylin-eosin, original magnification 

were 702 copies of mycobacteria in four 20-µm histologic sections (44.9 fg of M tuberculosis DNA/1 µg of total DNA). The method and primers used have been previously described.2

Comment. Ocular involvement with tuberculosis is rare.3 In this case, diagnosis was based on positive PCR results following negative results on multiple cultures and stains for AFB on tissue sections and body fluids. Histopathologic analysis may not always offer adequate sensitivity, especially when bacteria are few. This report exemplifies the importance of quantitative PCR in such cases. A confounding factor in this case was tissue immunoreactivity to herpes simplex virus type 1 antibody. Although the antibodies used have a high sensitivity, variable specificity and false-positive reactions may occur.4

This case also highlights the difficulty in treating multi-drug-resistant tuberculous scleritis, which is more likely to have a dismal prognosis as has scleritis secondary to drug-resistant atypical mycobacteria.5

Figure 2. External photograph and photomicrograph montage. A, External photograph showing the scleral rupture site superonasally in the right eye. B, Montage showing extensive areas of inflammatory infiltrate involving the sclera and uvea in the region of perforation (arrow). Note the areas of scleral necrosis (asterisk) (hematoxylin-eosin, original magnification ×4).

A 7-year-old female cynomolgus monkey had a choroidal melanoma. The clinical findings, ophthalmic and systemic investigations, and histopathological examination are described.

Report of a Case. A 7-year-old female cynomolgus monkey (Macaca fascicularis) was obtained in January 2006. Results of the prearrival screening tests for tuberculosis and simian retrovirus were negative. Mild hepatomegaly and moderate dental tartar were present on physical examination on arrival. Minimal hypochromic, normocytic anemia, neutropenia, and lymphocytosis were found on hematologic investigations, and histopathological examination. The serum chemistry data, including levels of hepatic enzymes, were unremarkable.

A prestudy ocular examination was performed in May 2006. Results of the external and anterior segment examinations of both eyes were unremarkable. The dilated examination showed a healthy retina in the right eye and an elevated choroidal mass involving the macula with some intrinsic peripheral pigmentation in the left eye (Figure 1A). Fluorescein angiography showed an intrinsic circulation within the mass with areas of hyperfluorescence (Figure 1B). Optical coherence tomography revealed a choroidal mass with high reflectivity and adjacent subretinal and intraretinal fluid (Figure 1C). B-scan ultrasonography showed acoustic hollowness with medium internal reflectivity. There was excavation of the underlying sclera (Figure 1D). The differential diagnosis included primary intraocular tumor or metastatic spread of a systemic malignant neoplasm as well as rare peripheral nerve sheath tumors such as schwannoma; however, the clinical presentation suggested a choroidal melanoma. The animal was euthanized 2 years after initial presentation, and a necropsy was done with enucleation. No significant change was noticed in the tumor on imaging prior to euthanasia. No other abnormalities were observed. The eye was fixed in Davidson solution prior to its transfer to 70% ethanol.

The histopathological examination of the eye showed a dumbbell-shaped mass arising from the choroid, penetrating the Bruch membrane, and involving the overlying choroid and sclera and uvea in the region of perforation (arrow). Note the areas of scleral necrosis (asterisk) (hematoxylin-eosin, original magnification ×4).

Figure 1. a, b, External photograph showing the scleral rupture site superonasally in the right eye. b, Montage showing extensive areas of inflammatory infiltrate involving the sclera and uvea in the region of perforation (arrow). Note the areas of scleral necrosis (asterisk) (hematoxylin-eosin, original magnification ×4).
ing retina at the macula (Figure 2A). It measured $3.2 \times 1.5$ mm. The tumor was composed of epithelioid and spindle cells (Figure 2B). Rare mitotic figures were noted. The pigmented epithelium of the ciliary body was disorganized with numerous displaced, dysplastic, and lightly pigmented cells present (Figure 2C). Results of immunohistochemical staining of the specimen with HMB-45 and for MART-1 were negative. Transmission electron microscopy, however, confirmed the diagnosis of choroidal melanoma by revealing melanosomes in tumor cells (Figure 2D).

Comment. Uveal melanoma is the most common primary intraocular malignant tumor in humans. Although it constitutes only about 5% of all melanomas, it contributes to 13% of melanoma deaths owing to the high rate of metastasis and poor response to treatment. Kaspareit et al reported spontaneous neoplasms of endocrine organs, the respiratory system, and the female genital system and lymphoma involving multiple organs but no choroidal melanoma in cynomolgus monkeys during a 15-year period. Searches on PubMed (a service of the National Library of Medicine and the National Institutes of Health) have failed to reveal any report of choroidal melanoma.
of Health), PrimateLit (a database that is the collaborative project of the Wisconsin Primate Research Center, the Washington National Primate Research Center, and the University of Wisconsin–Madison Libraries), IndexCat (a National Library of Medicine database), the CAB Abstracts (a database covering veterinary science literature), JSTOR (digital interdisciplinary archives for scholarship), and SciFinder Scholar (a large interdisciplinary database going back the mid 1800s) did not reveal any published report of uveal melanoma in a nonhuman primate. To our knowledge, this is the first reported case of a primary choroidal melanoma in a cynomolgus monkey. In addition to histopathological findings similar to those of human uveal melanoma, similar clinical features were observed in the choroidal mass. These features include a dumbbell shape, adjacent subretinal and intraretinal fluid, internal vascularity on fluorescein angiography, and medium internal reflectivity on B-scan ultrasonography. Although the tumor cells failed to stain for HMB-45 and MART-1, they have an appearance similar to the epithelioid and spindle cell type of human choroidal melanoma as described in the Callender classification modified by the Armed Forces Institute of Pathology. We attribute the absence of immunohistochemical staining to cross-reactivity of antibodies (that are directed against human antigens) with cytomelanosomes that are present in the monkey species. The finding of neoplastic melanocytes containing fully melanized mature melanosomes on transmission electron microscopy further supports the diagnosis of choroidal melanoma. Additionally, the presence of dysplastic pigmented epithelial cells in the ciliary body of this animal is interesting but of unknown significance. There is no known relationship between ocular melanoma and primate species, thereby opening the possibility of further genetic studies and breeding opportunities for primate model development that will advance our knowledge of human uveal melanoma.

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COMMENTS AND OPINIONS

Pathogenesis of Nonarteritic Anterior Ischemic Optic Neuropathy

In their article, Levin and Danesh-Meyer contend that, in nonarteritic anterior ischemic optic neuropathy (NAION), “in many cases the ischemia results from venous congestion.”

Since 1955 I have conducted extensive multifaceted studies on the blood supply and anatomy of the optic nerve as well as experimental and prospective clinical studies on various aspects of NAION (on more than 1000 patients) and central retinal vein occlusion (CRVO) (on more than 1000 patients). Based on those studies, I can only conclude that this hypothesis is based more on armchair philosophy than scientific facts. Thomas Henry Huxley said, “The great tragedy of Science - the slaying of a beautiful hypothesis by an ugly fact.” But what we need to find out is if the hypothesis is based on facts. In the space allowed for a letter to the editor, I cannot discuss the subject in detail. I will simply mention very briefly a few of the problems with the hypothesis. The authors have completely ignored some well-established fundamental facts involved in the pathogenesis of NAION that I have discussed at length elsewhere.

The crux is the authors’ lack of understanding of the anatomy of the optic nerve, vascular and venous system of the optic nerve, and pathogenesis and clinical features of CRVO and NAION.

They apply the concept of “cytotoxic and vasogenic edema” from the brain to the optic nerve. This is invalid because the morphology, vascular pattern, and many other