tically (Figure 2). *Toxoplasma gondii* serologic testing was positive for IgG and negative for IgM. We did not consider any treatment, including vitrectomy, given the inactivity of the toxoplasmic focus and the very large size of this macular hole.

**Comment.** Overlying vitreitis is a frequent finding with toxoplasmic chorioretinitis. Therefore, it is not unexpected to observe in some cases vitreous traction leading to retinal detachment. This complication has been described by several studies (5%-10% of cases).1-4 However, we could not find in the literature any described case of macular hole due to ocular toxoplasmosis (Table). A study of several hundred ocular toxoplasmosis cases observed a single case of a macular hole, but the case was not published (E. Frau, written communication, February 2004).4 Despite the large number of patients with ocular toxoplasmosis, no other studies have reported on macular holes.1-3

In conclusion, vitreous traction resulting from peripheral ocular toxoplasmosis may lead to a macular hole, even after several years. Therefore, patients with a peripheral toxoplasmic scar should be advised that symptoms of impending macular holes require consultation early so that early intervention might prevent progression to severe loss of central vision.

**Table. Studies Concerning Vitreoretinal Complications Consecutive to Ocular Toxoplasmoses**

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<tr>
<td>Bosch-Driessen et al.†</td>
<td>Ophthalmology</td>
<td>150</td>
<td>9</td>
<td>6</td>
<td>0†</td>
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<tr>
<td>Frau et al.,4 1997</td>
<td><em>J Fr Ophtalmol</em></td>
<td>Several hundred</td>
<td>7</td>
<td>&lt;5</td>
<td>1‡</td>
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<tr>
<td>Mets et al.,2 1996</td>
<td><em>Am J Ophthalmol</em></td>
<td>94</td>
<td>9</td>
<td>10</td>
<td>0§</td>
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<tr>
<td>Friedmann et al.,3 1969</td>
<td><em>Arch Ophthalmol</em></td>
<td>63</td>
<td>3</td>
<td>5</td>
<td>0</td>
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</tbody>
</table>

*The rate of retinal detachment varies between 5% and 10% whereas a macular hole was noted in only 1 patient.†L. Bosch-Driessen, written communication, October 2003.‡E. Frau, written communication, February 2004.§M. Mets, written communication, November 2003.

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**Solitary Choroidal Tuberculoma in an Immunocompetent Patient**

We report a case of choroidal tuberculoma in an immunocompetent patient who was referred to us with the possible diagnosis of choroidal melanoma. Findings from routine investigations failed to identify systemic tuberculosis infection. Visual improvement and choroidal tuberculoma involution to a flat inactive scar can occur with proper and rapid diagnosis and treatment.

**Report of a Case.** A 24-year-old Guinean man living in Belgium for the last 6 months was referred to our hospital with a 10-day history of decreased vision in the left eye. He was of poor socioeconomic status and had no signifi-
cant medical history, had not been exposed to tuberculosis, and had not received the bacille Calmette-Guérin vaccine. His visual acuity was 20/20 OD and 20/400 OS. Anterior segment examination findings from both eyes were within normal limits and did not reveal cell or flare. The right eye was normal on funduscopic examination. In the left eye, a 3-mm-diameter yellow choroidal mass was bisecting the fovea (Figure 1). Discrete vitreous inflammatory reaction was present. Fluorescein angiography findings demonstrated early heterogeneous blockage and late staining of the lesion. Results of B-scan ultrasonography showed a thick, dome-shaped choroidal lesion with a 4.8-mm irregular low-to-medium internal reflectivity. The differential diagnosis included infectious or inflammatory granuloma (sarcoidosis, tuberculosis), Toxocara, fungal disease, lymphoma, and choroidal metastasis. Amelanotic choroidal melanoma was not considered because it is uncommon in African patients.

Complete physical examination and medical evaluation findings, including a chest x-ray film, were normal. Results of a blood uveitis workup (serum angiotensin converting enzyme, serum lysozyme, fluorescent titer antibody, antibody screen, VDRL [Venereal Disease Research Laboratory] titer, Toxoplasma titer, Toxocara titer, Lyme titer, and cultures) were negative. Cultures of sputum and urine also yielded negative results. Test results for human immunodeficiency virus were negative. A purified protein derivative skin test was highly positive (induration, 25 mm). We made the clinical diagnosis of solitary choroidal tuberculoma in an immunocompetent patient in whom routine investigations failed to identify systemic tuberculosis infection. The patient was started on isoniazid, rifampin, and ethambutol for a 6-month period. The choroidal granuloma subsequently decreased in size over the following 6 months to form a flat chorioretinal scar (Figure 2). Visual acuity improved to 20/200 OS.

Comment. Ocular tuberculosis involving any tissue of the eye is a rare event (1% of all cases of tuberculosis). Most patients with ocular involvement have no history of pulmonary or systemic forms of tuberculosis, and 50% have normal findings on chest x-ray. Ocular manifestations associated with tuberculosis are either caused by an active infection or an immunologic reaction (delayed hypersensitivity) in the absence of any infectious agent. Choroidal infection is the most common ocular manifestation during dissemination of the bacillus via the blood stream. Choroidal tubercles are frequently unilateral and appear predominantly in the posterior pole as solitary or multiple amelanotic lesions. They may manifest with or without active tuberculosis.

To our knowledge, only 4 other cases of a choroidal tuberculoma without systemic evidence of tuberculosis and normal chest radiograph findings have been reported. Purified protein derivative skin test results were positive in 2 cases. The third case was confirmed after histopathological examination of the enucleated eye. Mycobacterium tuberculosis DNA amplification by polymerase chain reaction on aqueous humor sample confirmed the diagnosis in the fourth case.

Ocular diagnosis is generally presumptive and is based primarily on clinical appearance, systemic evaluation, and response to treatment. The angiographic and ultrasonographic features can assist in excluding other diagnoses (eg, amelanotic choroidal melanoma, choroidal metastasis). Histopathologic confirmation from ocular tissues is uncommon and difficult to obtain. Molecular diagnosis of tuberculosis by polymerase chain reaction has been recently applied to detect M tuberculosis from aqueous humor or vitreous with interesting results.

Positive purified protein derivative skin test results do not indicate a systemic tuberculosis infection, but this is the first test performed in the investigation of a patient in whom tuberculosis is suspected. The size of the reaction, contact history, regional prevalence of atypical mycobacteria, and patient

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**Figure 1.** Choroidal mass bisecting the fovea.

**Figure 2.** Flat choroidal scar 6 months after antituberculosis therapy.
characteristics such as age and immune status should be taken into consideration while interpreting the result of a purified protein derivative skin test. Nevertheless, all individuals with reaction sizes greater than 22 mm were found to be infected with M. tuberculosis, regardless of contact history.

Most patients with ocular tuberculosis require systemic therapy, and isoniazid, rifampin, pyrazinamide, ethambutol, and streptomycin are the principal antituberculosis drugs. Protocol for treating ocular tuberculosis is similar to that for pulmonary tuberculosis and should be adapted to the immune status of the patient. Visual recovery and choroidal tuberculoma involution to a flat inactive scar can occur with proper and rapid diagnosis and treatment.

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From the Archives of the Archives

The most important pneumococcal infection in the eye is the serpentine ulcer of the cornea (hypopyon keratitis), though the typical clinical picture is exceptionally produced by other organisms. The treatment of this condition with serum is entirely due to Roemer’s excellent work.