9 months of age, the infant had rovitory iridocyclitis of the right eye. At the course of sulfadiazine, pyrimethamine, and plasma were established, and the areas of subcortical calcification. The brain demonstrated multiple areas of subcortical calcification. The fundus examination findings from the parents were normal. Blood cultures of the infant were negative for organisms. Initial serologic testing results were positive for Toxoplasma IgG and negative for Toxoplasma IgM. A subsequent IgM titer for Toxoplasma was positive. The infant’s mother had an IgG titer positive for Toxoplasma and an IgM titer negative for that organism. Findings from the cerebrospinal fluid culture were negative for organisms, and the values for its components were normal apart from a high total protein level (127 mg/dL). A vitreous biopsy and aspiration of the left eye were performed. The culture was negative for organisms and the findings from polymerase chain reaction analysis of the aspirate were positive for Toxoplasma gondii and negative for Toxocara canis, herpes simplex virus, herpes zoster virus, and Cytomegalovirus.

A diagnosis of congenital toxoplasmosis was established, and the patient was treated with a 6-month course of sulfadiazine, pyrimethamine, and leucovorin calcium. Topical steroids were used to treat the iridocyclitis of the right eye. At 9 months of age, the infant had roving nystagmus and a sensory esotropia. Follow-up examination 9 months later demonstrated no active iridocyclitis, viritis, or retinitis, but there was a stable retinal fold in the right eye.

Comment. Toxoplasmic chorioretinitis is the most common ocular manifestation of both congenital and acquired toxoplasmosis. Retinal detachment, mostly of a tractional origin, occurs in only 10% of cases of congenital toxoplasmosis. Among the entities that were considered in the differential diagnosis of this case were viral retinides, toxocariasis, familial exudative vitreoretinopathy, Norrie disease, and retinoblastoma. A normal family medical history, negative findings for organisms on serologic testing and culturing, and the clinical picture helped to exclude these other possibilities. Although clinical manifestations are usually sufficient to diagnose both congenital and acquired toxoplasmosis, occasionally it presents a diagnostic challenge. In this case, the presence of a macular retinal fold in the absence of the typical chorioretinal lesions and the IgM titer that was initially negative for toxoplasmosis presented a diagnostic challenge. The use of all available investigations, including polymerase chain reaction analysis of the ocular fluid, and viewing this case in the context of other nonocular manifestations helped us reach the proper diagnosis. The prevalence of congenital toxoplasmosis is decreasing and clinicians may be less likely to think of it as a cause of disease, especially when it is atypical in appearance. We report this case of congenital toxoplasmosis because of its atypical ocular presentation.

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The Utility of 0.5% Apraclonidine in the Diagnosis of Horner Syndrome

In 1999, Morales et al. reported that 1.0% apraclonidine hydrochloride (Iopidine; Alcon, Ft Worth, Tex) could be used to diagnose Horner syndrome. Apraclonidine caused reversal of anisocoria (the miotic pupil with Horner syndrome became larger than the normal pupil) in all patients in their study. Apraclonidine is primarily an α2-receptor agonist, but it does have some weak α1 affinity, as evidenced by conjunctival blanching. The authors postulated that the reversal of anisocoria was due to denervation hypersensitivity of α2-receptors in the pupil dilator muscle. The purpose of our study is to determine whether 0.5% apraclonidine, which is less expensive and more readily available than the 1.0% formulation, might also be used to diagnose Horner syndrome in the same lighting conditions.

Report of Cases. Patients with known or newly diagnosed Horner syndrome in 2 of our practices (those of R.A. and K.A.F.) were invited to participate, and institutional review board approval was obtained. Cases were consecutive, and all were confirmed by pharmacologic testing. Demographic data collected included patient age, sex, etiology and duration of Horner syndrome (if known), lesion location (preganglionic or postganglionic, if known), and results of previous pharmacologic testing.

Figure 2. Computed tomographic scan of the brain with contrast showing multiple areas of subcortical calcification.
The baseline pupil diameter was recorded in both dark and light ambient illumination using a Rosenbaum pupil card and measuring to the nearest 0.5 mm. One drop of 0.5% apraclonidine was instilled into each eye. Pupil measurements were repeated 60 minutes later.

Patient demographic information and the results of previous pharmacologic testing are summarized in the Table. The mean patient age was 51 years (range, 39-73 years). The difference in pupil diameter for each condition tested is illustrated in Figure 1 and Figure 2. The test sensitivity was 0.88.

Comment. In 1999, Morales et al1 sought to investigate the intraocular pressure–lowering effect of 1.0% apraclonidine on preganglionic vs postganglionic $\alpha_2$-receptors. They used a small cohort of patients with Horner syndrome in which those with preganglionic lesions showed a purely postganglionic pressure response; fellow eyes served as controls. Coincidentally, a remarkable reversal of anisocoria was found in all patients.

Compared with other $\alpha_2$-agonists such as brimonidine tartrate, apraclonidine appears unique in having weak but clinically detectable $\alpha_1$-activity. The authors postulated that the anisocoria reversal seen in patients with Horner syndrome demonstrated denervation hypersensitivity of postsynaptic $\alpha_1$-receptors in the pupil dilator muscle. This effect may be indirectly amplified by the absence of presynaptic $\alpha_2$-receptor activity, which normally down-regulates the release of norepinephrine into the synaptic junction and thus decelerates $\alpha_1$-stimulated mydriasis. This theory was supported by evidence obtained through an extensive review of the clinical and pharmacologic literature pertaining to the action of apraclonidine,2,3 and readers are re-

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**Table**

<table>
<thead>
<tr>
<th>Patient No./Age, y/Sex</th>
<th>Etiology of Horner Syndrome</th>
<th>Lesion Location</th>
<th>Duration</th>
<th>Pharmacologic Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/57/F</td>
<td>Unknown</td>
<td>Postganglionic</td>
<td>9 y</td>
<td>NA</td>
</tr>
<tr>
<td>2/43/F</td>
<td>Unknown</td>
<td>Unknown</td>
<td>9 mo</td>
<td>No dilation</td>
</tr>
<tr>
<td>3/56/F</td>
<td>Possible cervical disc disease</td>
<td>Unknown</td>
<td>8-12 mo</td>
<td>NA</td>
</tr>
<tr>
<td>4/42/F</td>
<td>Cervical disc degeneration</td>
<td>Postganglionic</td>
<td>2 y</td>
<td>NA</td>
</tr>
<tr>
<td>5/75/F</td>
<td>Cervical degeneration</td>
<td>Postganglionic</td>
<td>Unknown</td>
<td>NA</td>
</tr>
<tr>
<td>6/48/M</td>
<td>Cervical tumor (goiter)</td>
<td>Unknown</td>
<td>4 mo</td>
<td>NA</td>
</tr>
<tr>
<td>7/39/F</td>
<td>Posterior T2 ganglionectomy</td>
<td>Unknown</td>
<td>10 mo</td>
<td>NA</td>
</tr>
<tr>
<td>8/57/M</td>
<td>Carotid stenosis</td>
<td>Postganglionic</td>
<td>1 mo</td>
<td>NA</td>
</tr>
</tbody>
</table>

Abbreviations: HA, hydroxyamphetamine hydrobromide; NA, not applicable.
ferred to the original article\textsuperscript{1} for that discussion. Our study was undertaken to determine whether 0.5% apraclonidine, currently the more readily available commercial product, might also cause reversal of anisocoria in patients with Horner syndrome.

Seven of 8 patients showed a reversal of anisocoria of at least 0.5 mm in both dark and light conditions. One patient did not show reversal. Although the small sample size precludes a detailed statistical analysis, an examination of the Figures shows that patients with a greater degree of anisocoria generally showed a greater degree of reverse anisocoria after apraclonidine instillation. This may reflect a greater or more long-standing degree of denervation and therefore of $\alpha_2$-receptor hypersensitivity. It is not possible to correlate the degree of reversal with the location and duration of the lesion because both were unknown in several patients in this small series.

Clinically the anisocoria reversal, even when slight, was easily detected with the naked eye. Testing for Horner syndrome using 0.5% apraclonidine does not depend on highly accurate measurements of the pupil diameter and is unlikely to be confounded by physiologic variation in pupil size or mild differences in room illumination before and after apraclonidine administration. Topical cocaine hydrochloride and hydroxyamphetamine hydrobromide are increasingly difficult and costly to obtain and are rarely used for any purpose by ophthalmologists other than to diagnose Horner syndrome. Within our admittedly small cohort, we have demonstrated that 0.5% apraclonidine, which is readily available in a multidose preserved bottle, is an acceptably sensitive test for the detection of this infrequent condition. Even though the mechanism of action is different, we propose that 0.5% apraclonidine may be substituted for cocaine in the pharmacologic confirmation of Horner syndrome. For localization of the sympathetic lesion, hydroxyamphetamine is still required. If apraclonidine does not cause anisocoria reversal and there is an important therapeutic need to pharmacologically confirm the diagnosis, further assessment with the classic agents should be conducted.

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\textbf{From the Archives of the ARCHIVES}

\textbf{The Lymph Passages of the Lids}

Grunert followed the method of Gerota in injecting a solution of Prussian blue into the skin of the lid. This fills first the superficial network of the lymph spaces and capillaries which pervades the subcutaneous fatty tissue between the skin and the orbicularis muscle. Among the muscle bundles numerous canals pass to a second network which lies on the tarsus. The exit channels have deep and superficial origins, but both end jointly in the same lymph gland.