Uveitis and cerebral reticulum-cell sarcoma (large-cell lymphoma)

Case report

THOMAS J. ROSENBAUM, M.D., COLLIN S. MACCARTY, M.D., AND HELMUT BUETTNER, M.D.

Departments of Neurologic Surgery and Ophthalmology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota

A patient with a peculiarly refractory uveitis and vitritis was later found to have an infiltrative mass lesion of the posterior portion of the corpus callosum. The histopathological diagnosis of reticulum-cell sarcoma (large-cell lymphoma) was made after study of vitreous tissue obtained by pars plana vitrectomy of the right eye. Intraocular involvement with cerebral reticulum-cell sarcoma has been reported previously.

KEY WORDS - reticulum-cell sarcoma - large-cell lymphoma - uveitis - vitritis - pars plana vitrectomy - microglioma

In 1955, Givner described a patient who had decreased vision from uveitis of unknown cause and who later developed reticulum-cell sarcoma of the brain. This association was established by Neault, et al., in 1972, with the report of seven cases confirmed histologically after craniotomy for cerebral reticulum-cell sarcoma, preceded by uveitis. Barr, et al., later added four cases and demonstrated that the uveitis was caused by neoplastic cells infiltrating the vitreous. Recently, vitreous aspiration and pars plana vitrectomy have been used to establish the histological diagnosis of intraocular reticulum-cell sarcoma.

We report a case of cerebral reticulum-cell sarcoma with intraocular involvement, in which the histological diagnosis was established through cytological study of the material obtained by pars plana vitrectomy of one eye.

Case Report

This 71-year-old man first noticed progressive clouding of his vision in early 1976. In August, 1977, when he was first seen at the Mayo Clinic, his visual acuity was 20/50 and 14/28 in the right eye, and 20/30 and 14/21 in the left eye. Externally, both eyes were quiet. The aqueous humor in both eyes exhibited mild flare and some cells, and there were numerous keratic precipitates on the corneal endothelium, more in the right than in the left. The intraocular pressure was normal in both eyes, and the lenses showed mild nuclear sclerosis. The vitreous in both eyes was diffusely infiltrated by round grayish cells, which were larger than the more irregularly shaped cells that are seen in the vitreous in inflammatory conditions of the eye. These cells also tended to cluster. The fundus visibility was somewhat decreased because of the vitreous haze (Fig. 1), but the optic disc, macula, and periphery of the fundus appeared to be grossly normal. Treatment with topically applied steroids (hydrocortisone, one drop twice a day to each eye) did not affect the visual acuity or the clinical findings. Thorough medical evaluation did not reveal any underlying disease.

The patient's vision had decreased to 20/50 and 14/56 in both eyes when he returned in November, 1977, at which time he had mild confusion and complained of severe frontal headaches associated with nausea and vomiting. The anterior chamber reaction and the cellular infiltrate of the vitreous were unchanged. However, right quadrantanopia had developed. Neurological evaluation demonstrated
Cerebral reticulum-cell sarcoma and uveitis
decreased cognitive function, including calculation
and short-term memory. The patient was ataxic, with
hyperreflexia and bilateral Babinski signs.
A computerized tomogram (CT) of the head
demonstrated a mass in the posterior portion of the
corpus callosum. The mass extended into the
tempo-occipital regions bilaterally, with surround-
ing edema and uptake of contrast material (Fig. 2
left). A transfemoral angiogram indicated an in-
filtrating lesion in the posterior corpus callosum. The
patient underwent whole-brain irradiation without or-
bital ports (25 treatments totalling 5000 rads), and the
neurological abnormalities resolved. A CT scan 6
months after irradiation showed marked resolution of
the lesion (Fig. 2 right).
By January, 1978, his vision had improved to 20/25
and 14/21 in the right eye, and 20/30 and 14/21 in
the left eye. Three months later, his vision had
progressively worsened and acuity was 20/40— and
14/89 in the right eye, and 20/70 and 14/56 in the left
eye. Pronounced vitreous haze due to cellular infiltra-
tion was the cause of the decreased vision. On March
27, 1978, a pars plana vitrectomy (Fig. 3) was per-
formed in the right eye. The vitreous material was
collected on a millipore filter and stained with a
modified Papanicolaou stain. On microscopic ex-
amination, large lymphoid cells with large
hyperchromatic nuclei, believed to be consistent with
large-cell lymphoma (reticulum-cell sarcoma), were
found (Fig. 4 left). The postoperative course was un-
eventful, and the patient's vision in the right eye
returned to 20/25 and 14/21 once the optical media
cleared (Fig. 4 right). The vision of the left eye
remained at the 20/50— level. Irradiation of the left
eye was considered, but the patient did not consent to
it. Neurologically, the patient has remained well and stable.

Discussion
Reticulum-cell sarcoma is a large-cell malignant
lymphoma, arising generally in the lymph nodes or
spleen but also in the bone or the central nervous

Fig. 1. Fundus photograph of the right eye taken before
pars plana vitrectomy. The optic disc and large retinal
vessels are blurred because of vitreous haze caused by
cellular infiltrate.

Fig. 2. Computerized tomography of the head. Left: First scan demonstrates a mass lesion in the
posterior corpus callosum extending into the temporo-occipital regions bilaterally. Note surrounding edema
and avid uptake of contrast material. Right: Scan 6 months after whole-brain irradiation with 5000 rads.
Note resolution of the mass lesion in the posterior corpus callosum.
system (CNS). Cerebral dissemination with systemic disease is uncommon and is almost always in the form of meningeal deposits first, whereas primary reticulum-cell sarcoma of the CNS is infiltrative, and extracranial metastasis is unusual. Microglial cells of the CNS and reticulum cells or histocytes elsewhere in the body share a common origin. Therefore, many pathologists have abandoned the category of microglioma in favor of a broad category of cerebral reticulum-cell sarcoma. Others, however, continue to use the term "microglioma" when a focal area of predominant microglial tumor cells is present or the process is diffuse or multicentric, considering the diagnosis of reticulum-cell sarcoma only when the histological structure is identical to that of a systemic tumor.

To our knowledge, only 38 cases of intraocular reticulum-cell sarcoma have been recorded in the English literature. Autopsy in two of the cases revealed eye involvement only. The remaining cases were associated either with systemic involvement or with primary reticulum-cell sarcoma (microglioma) of the CNS. There were 19 recorded cases of cerebral reticulum-cell sarcoma with uveitis from intraocular tumor (Table 1). The mean age of these patients was 54 years, and the sex ratio was approximately equal. In all but three cases, the initial presenting complaint was decreased visual acuity, and an ophthalmological examination revealed uveitis, bilateral or unilateral, at the outset. Eye symptoms preceded brain symptoms by an average of 20.6 months. The tumor bulk was generally located within one cerebral hemisphere.
Cerebral reticulum-cell sarcoma and uveitis

TABLE 1

Reported cases of cerebral reticulum-cell sarcoma with uveitis from intracranial tumor

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Sex, Age (yrs)</th>
<th>Initial Symptom</th>
<th>Interval (mos)</th>
<th>Method of Diagnosis</th>
<th>Tumor Site</th>
</tr>
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<tbody>
<tr>
<td>Givner, 1955</td>
<td>F, 49</td>
<td>uveitis</td>
<td>9</td>
<td>craniotomy</td>
<td>lt temporoparietal</td>
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<tr>
<td></td>
<td>M, 67</td>
<td>uveitis</td>
<td>2</td>
<td>enucleation</td>
<td>lt cerebral</td>
</tr>
<tr>
<td></td>
<td>F, 40</td>
<td>uveitis</td>
<td>11</td>
<td>enucleation &amp; craniotomy</td>
<td>lt parieto-occipital</td>
</tr>
<tr>
<td>Vogel, et al., 1968</td>
<td>M, 67</td>
<td>uveitis</td>
<td>72</td>
<td>craniotomy</td>
<td>rt temporoparietal</td>
</tr>
<tr>
<td>Neault, et al., 1972</td>
<td>F, 40</td>
<td>uveitis</td>
<td>4</td>
<td>craniotomy</td>
<td>rt frontal</td>
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<tr>
<td></td>
<td>M, 59</td>
<td>uveitis</td>
<td>94</td>
<td>craniotomy</td>
<td>lt frontoparietal</td>
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<tr>
<td></td>
<td>F, 60</td>
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<td>11</td>
<td>craniotomy</td>
<td>lt frontoparietal</td>
</tr>
<tr>
<td></td>
<td>F, 66</td>
<td>uveitis</td>
<td>4</td>
<td>craniotomy</td>
<td>lt frontotemporal</td>
</tr>
<tr>
<td></td>
<td>M, 57</td>
<td>uveitis</td>
<td>2</td>
<td>craniotomy</td>
<td>rt cerebellar</td>
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<td></td>
<td>M, 64</td>
<td>uveitis</td>
<td>50</td>
<td>craniotomy</td>
<td>rt parietal</td>
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<td>Klingele &amp; Hogan, 1975</td>
<td>F, 52</td>
<td>headache &amp; weak arm</td>
<td>27</td>
<td>craniotomy</td>
<td>lt frontal</td>
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<tr>
<td></td>
<td>M, 67</td>
<td>uveitis</td>
<td>4</td>
<td>craniotomy</td>
<td>rt parietal</td>
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<td></td>
<td>M, 60</td>
<td>seizure</td>
<td>6</td>
<td>craniotomy</td>
<td>lt parietal</td>
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<td></td>
<td>M, 38</td>
<td>uveitis</td>
<td>60</td>
<td>CSF cell study</td>
<td>meningeval</td>
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<tr>
<td></td>
<td>M, 65</td>
<td>lt hemiparesis</td>
<td>70*</td>
<td>craniotomy</td>
<td>rt parietal</td>
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<td>Barr, et al., 1975</td>
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<td>uveitis</td>
<td>13</td>
<td>autopsy</td>
<td>lt frontoparietal</td>
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<td>Minckler, et al., 1975</td>
<td>F, 65</td>
<td>uveitis</td>
<td>42</td>
<td>autopsy</td>
<td>lt thalamic</td>
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<tr>
<td>Kennerdell, et al., 1975</td>
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<td>30</td>
<td>autopsy</td>
<td>corpus callosum</td>
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<tr>
<td>Appen, 1975</td>
<td>M, 46</td>
<td>uveitis</td>
<td>6</td>
<td>craniotomy</td>
<td>lt frontal</td>
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</tbody>
</table>

*Patient still alive.

although in one case the cerebellum was involved. There was no relationship between the side of the cerebral tumor and either the eye that was involved first with uveitis or the eye that was more severely involved. Craniotomy was the most common method of obtaining tissue for histological diagnosis.

Our case is not unusual in respect to patient age, mode of onset, or clinical course. However, the recent development of pars plana vitreous surgery allows a new diagnostic approach to this entity. The diagnosis was confirmed histologically by pars plana vitrectomy.

In 1975, Michels, et al., and Klingele and Hogan each reported two cases of intraocular reticulum-cell sarcoma in which biopsy revealed that the primary lesion was in the eye or that there was widespread systemic tumor. The diagnoses were established by pars plana vitrectomy.

Our patient is the first reported case of cerebral involvement in which cytological study of the vitreous led to the diagnosis of reticulum-cell sarcoma (large-cell lymphoma). In only one other case of cerebral reticulum sarcoma, that reported by Kennerdell, et al., have cells been recovered from the vitreous, but these were interpreted histologically as being inflammatory rather than neoplastic.

The primary mode of therapy of reticulum-cell sarcoma (large-cell lymphoma) of the CNS is radiation therapy after histological confirmation of the diagnosis. Histopathological verification may be achieved by craniotomy with debulking of the mass, by study of the cerebrospinal fluid if the involvement is primarily leptomeningeal, or by vitrectomy if the vitreous is involved and craniotomy is not required. Vitrectomy, cranial radiation with or without orbital ports, and systemic chemotherapy may all improve visual acuity.12 Although intraocular reticulum-cell sarcoma is uncommon, the possibility of ocular and cerebral malignancy must be considered if there is uveitis and vitritis of otherwise unexplained cause along with neurological symptoms.

The temporary improvement of vision noticed by our patient may have been the transient effect of "stray" radiation on the intravitreal lymphoma cells, when his brain was irradiated. Because large-cell lymphoma is radiosensitive, irradiation of the fellow eye after histopathological confirmation of the diagnosis by pars plana vitrectomy in the first eye should be considered.

References

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Address reprint requests to: Thomas J. Rosenbaum, M.D., c/o Section of Publications, Mayo Clinic, 200 First Street S.W., Rochester, Minnesota 55901.