Transient global amnesia associated with a single metastasis in the non-dominant hemisphere

Case report

GIDEON FINDLER, M.D., MOSHE FEINSOD, M.D., GRACIELA LIJOVETZKY, B.Sc., M.D., AND MOSHE HADANI, M.D.

Department of Neurosurgery and Pathology, Hadassah University Medical Center, Ein Kerem, Jerusalem, Israel

A patient in whom transient global amnesia (TGA) led to the diagnosis of a metastasis of a transition-cell carcinoma of the bladder to the non-dominant hemisphere is described. In previously reported cases of TGA associated with brain tumors, the tumors involved either the dominant or both hemispheres. The etiology of TGA associated with a brain tumor is most likely vascular, as suggested by the sudden development and the transitory character of the event. In contrast to the "common" form of TGA (where both temporal lobes suffer temporary ischemia), in these patients only one side of the limbic system is affected, because a brain tumor has already compromised the other limbic area. Therefore, the dominance of the hemisphere with the tumor is of no consequence, as both hemispheres have been involved. It is concluded that the TGA in these patients is not due to, but is rather associated with, a unilateral brain tumor.

KEY WORDS · transient global amnesia · brain metastasis · metastatic tumor · transitional-cell carcinoma

Case Report

This 67-year-old man was admitted in August, 1981, to a neurological service because of the sudden onset of confabulation, confusion, and memory loss. He was known to suffer from transitional-cell carcinoma of the bladder, proven by biopsy in 1979, and had been treated by repeated local resection and chemotherapy. During the 2-year follow-up period, he had shown no evidence of metastasis.

Examination. He was agitated, confused, and unable to recall recent events or recognize friends. He did, however, recognize members of his family. There were no other neurological signs. Fundi were normal. Blood pressure and pulse were normal, and physical examination revealed no pathological findings. Carotid pulsations were equal bilaterally without bruits. Laboratory blood and urine analysis, and skull and chest films were normal. An electrocardiogram showed no arrhythmia, and an electroencephalogram (EEG) was normal.

There was gradual clearing of the patient's condition, and after 6 hours he had completely regained his
TABLE 1

Summary of patients with transient global amnesia associated with brain tumor

<table>
<thead>
<tr>
<th>Authors, Year</th>
<th>Age (yrs)</th>
<th>Tumor Type</th>
<th>Site of Tumor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aimard, et al., 1971</td>
<td>65</td>
<td>glioma</td>
<td>corpus callosum &amp; bilateral thalamic area</td>
</tr>
<tr>
<td>Hartley, et al., 1974</td>
<td>62</td>
<td>pituitary adenoma</td>
<td>sella turcica with suprasellar &amp; lt parasellar extension</td>
</tr>
<tr>
<td>Boudin, et al., 1975</td>
<td>75</td>
<td>glioma</td>
<td>bilateral limbic systems</td>
</tr>
<tr>
<td>Lisak &amp; Zimmerman, 1977</td>
<td>70</td>
<td>glioma</td>
<td>lt thalamic area</td>
</tr>
<tr>
<td>Ziegler, et al., 1977</td>
<td>59</td>
<td>glioma</td>
<td>corpus callosum &amp; bilateral thalamic regions</td>
</tr>
<tr>
<td>Shuping, et al., 1980</td>
<td>60</td>
<td>glioma</td>
<td>lt posterior thalamic region</td>
</tr>
<tr>
<td>Findler, et al., 1983</td>
<td>67</td>
<td>metastasis of bladder carcinoma</td>
<td>rt posterior thalamic region</td>
</tr>
</tbody>
</table>

Fig. 1. Computerized tomography scan with contrast enhancement showing a deep-seated cystic mass in the right posterior thalamic region.

memory. He could not recall the event and was surprised to find himself at the hospital. On further questioning and neuropsychological examination, he appeared to be purely right-handed. The next day he was well oriented; however, a very mild left hand weakness had ensued. Computerized tomography (CT) revealed a deep-seated right temporal cystic mass (Fig. 1).

Operation. Through a temporo-occipital craniotomy, the cyst was drained and a biopsy was taken. Histological examination revealed a metastasis of the transitional-cell carcinoma of the bladder. The patient was referred for radiotherapy.

Discussion

Brain tumors are known to produce dementia and memory loss of slow progression. An abrupt onset of memory loss is, however, not frequently seen in association with a brain tumor. Only six reports of such an event have been found (Table 1). In four of them, the tumor involved both the thalamic and limbic systems. In the other two, a glioma was found in one hemisphere only: in both, the left (dominant) hemisphere was involved. In our patient, the right (non-dominant) hemisphere was invaded by the tumor.

Various explanations have been suggested as to the etiology of TGA in patients with brain tumors; these include convulsive phenomena, occlusion of a blood vessel by the tumor mass, and hemorrhage within the tumor with subsequent sudden expansion. However, a normal EEG, and the lack of hemorrhage or midline shift on the CT scan exclude these as the cause of TGA in our patient. It is conceivable that the TGA was not directly related to the tumor or to any change within its mass, but was the result of two different lesions which independently caused damage to both sides of the limbic system. The metastasis in the right hemisphere rendered the patient vulnerable to TGA, which probably occurred because of transient vascular insufficiency in the left hemisphere. This is in accordance with the concept that TGA develops only when both temporal lobes are involved.

We may assume that the dominance of the hemisphere harboring the tumor plays no role in the production of TGA, as both hemispheres are involved, either by a tumor or by ischemia. This is in contrast with the findings of Shuping, et al., who suggested that a unilateral lesion can cause TGA, provided it is in the dominant temporal lobe. However, they did not explain the TGA in their patient.

Sudden destruction of the fornices and/or the mammillary bodies by the tumor was suggested as the cause of TGA by Ziegler, et al. This also is unlikely as it does not explain the transitory nature of the memory loss. The vascular etiology of the TGA in our patient, as well as in the cases described by others, is supported by the patients’ ages (Table 1), which are in the range commonly seen in patients with “idiopathic” TGA.

Thus, TGA is not due to a unilateral brain tumor, but rather is associated with it. Consequently, it is suggested that a CT scan should be performed routinely in all patients with TGA to exclude surgical
Transient global amnesia

lesions, in spite of the rarity of tumors and metastasis presenting with an abrupt transient memory loss.

The appearance on CT scanning of a metastasis of a transitional-cell carcinoma to the brain is nonspecific, and differential diagnosis includes primary brain tumors (gliomas), brain abscess, and infarction. A single metastasis of such a tumor to the brain is rare; most of the patients reported in the literature had asymptomatic multiple brain metastases, found only at autopsy. Goldman, et al., described a symptomatic case of single metastasis from a bladder carcinoma to the brain; however, that patient also had widespread systemic involvement. Our patient had no evidence of such spread.

References


Manuscript received May 3, 1982.
Accepted in final form September 8, 1982.
Address reprint requests to: Gideon Findler, M.D., Department of Neurosurgery, Sheba Medical Center, Tel Hashomer, Israel.