History and Exam

This is the case of a 61-year-old male, seen initially on June 28 by neuro-ophthalmology for diplopia and facial numbness. In May he developed tingling and numbness on the left chin progressing to involve the entire left side of the face over one month. A brain MRI was interpreted as “inconclusive” although that scan is unavailable. In late May the left eye “froze,” “it moved hardly at all.” This led to repeat MRI on June 1 that was said to be negative for lesions. An MRA showed an 80% stenosis of the Lt ICA. A spinal tap was done at that time. CSF showed a low-grade pleocytosis but was otherwise normal. Cytology was not performed but no malignant cells were appreciated on smear. Lyme serology done because of recent travel to CT was negative as were IgG studies.

Because of the carotid stenosis the patient underwent carotid endarterectomy (CEA).

While in the hospital he was found to be anemic, leading to diagnosis of colon cancer. Colectomy was performed for stage C, invasive, moderately to poorly differentiated adenocarcinoma with 4 of 9 nodes positive. Imaging of the abdomen and chest revealed no metastatic lesions in liver or lungs. The patient started on chemotherapy (Camptosar 125 mg/M2, leucovorin 20/mg/M2, 5-FU 350 mg/M2 on a three week on, fourth week off treatment) beginning in early June, completing one course by the time of his evaluation and completing a second course during the next month.

PMH: unremarkable other than as detailed above.

On exam, visual acuity, color vision, pupil reactions, anterior segment and fundi were all normal. There was age-related ptosis with mild but symmetrically weak eye closure. Eye movements OD were normal. In primary position OS was fully deviated medially, moved to the midline but not past it on left gaze and had full vertical movements. The general neurologic examination was unremarkable. Specifically there was no facial motor weakness, hearing was normal, and tongue, soft palate function and gag were intact.

The patient’s findings localized to the left cavernous sinus region. The patient’s oncologist was enthusiastic about the patient’s prognosis with chemotherapy, stating that the absence of any metastatic disease in the liver or lungs argued strongly against metastatic colon cancer. She agreed, however, that another MRI was appropriate and on July 16 a repeat study was also interpreted as negative, no metastases. Both MRI’s were obtained for review.

On review the initial MRI on June 1 was found to have marked, symmetric enlargement of both cavernous sinuses. There was some extracavernous extension on the left in the region of the petroclival region where the fifth nerve crosses over the petrous apex and the sixth nerve enters the cavernous sinus. Interestingly, the MRI of July 16 showed marked resolution of the cavernous sinus enlargement but persistence of the petroclival mass adjacent to the cavernous sinus. In addition, the trigeminal nerve could be seen to enhance. A reading without history by our neuroradiologist indicated infiltrative or inflammatory conditions as the most likely diagnosis, specifically lymphoma or sarcoid. With the history of cancer the neuroradiology comment was that metastatic cancer was always a possibility. The oncologist remained skeptical and continued chemotherapy. A spinal tap with cytology was normal in all respects.

Management choices: Repeat CSF cytologies; biopsy; observation?
The Cavernous Sinus Is Normal?

Answer

Final Diagnosis

Since this is a neuro-ophthalmology-pathology symposium the answer must be biopsy. At the time, however, the radiologic findings had improved and therefore the patient was followed with planned repeat MRI one month later. He finished the second course of chemotherapy but was clinically unchanged. Repeat MRI showed return of cavernous sinus enlargement with enhancement of additional cranial nerves. A biopsy/decompression of the extracavernous extension in the petroclival region was done. The pathology report was metastatic poorly differentiated adenocarcinoma of colonic primary with essentially identical morphology as that of the original colon tumor.

Summary of Case Including Pathology

In an earlier time, Thomas and Yoss reviewed 102 cases of parasellar syndrome at the Mayo Clinic and found 13 cases of inflammation (Herpes zoster, Tolosa Hunt, arachnoiditis, giant cell arteritis, Wegener’s granulomatosis and Lues), 19 aneurysms, and 70 neoplasms. Of the neoplasms, four were lymphoma or multiple myeloma and 23 were distant metastases, two from the GI tract. The majority, two-thirds, of neoplastic parasellar syndromes at the cranial base are the result of a primary intracranial tumor (pituitary adenoma, meningioma, craniopharyngioma, neurofibroma, chordoma) or local spread of a sinus or nasopharyngeal tumor, a figure likely to remain valid in today’s world of sensitive neuroimaging. Thomas and Yoss did not note how in many patients the neurologic syndrome was the presenting problem in the cases with distant metastases. In a review of 17 patients with cavernous sinus metastases, Lanning Kline, Joel Glaser and others had six patients in whom the cavernous sinus syndrome was the presenting complaint but did not specify which primaries these patients had; in any case, none of their patients had GI malignancies. There has been one report of acute bilateral ophthalmoplegia secondary to cavernous sinus metastases from a known colon cancer primary in a patient with known liver metastases. Cavernous sinus syndrome as a presenting symptom of unknown GI malignancies is rare.

Bilateral symmetric cavernous sinus changes raised the possibility of lymphoma. Lymphoma was responsible for two of 17 cases in Kline and Glaser’s series and, along with multiple myeloma, four of Thomas and Yoss’ cases. Three of four of Roman-Goldstein et al.’s cases of primary lymphoma at the cranial base involved the cavernous sinus with peri orbital pain and diplopia. Cavernous sinus involvement by lymphoma is not common (see reviews by Galetta and Nakatomi) and primary cavernous sinus lymphoma makes up only a minority of these cases. Bilaterality also does not appear to be very helpful: reviewing cavernous sinus syndrome related to lymphoma, Kasner et al. found only one bilateral case out of 16 cases. Bilateral metastases from distant sites to the cavernous sinuses are also uncommon but probably occur with sufficient frequency that this is not a useful distinguishing feature.

Pain is common in cavernous sinus syndrome whether from distant metastases or lymphoma, sometimes leading to a misdiagnosis of Tolosa-Hunt syndrome. Nevertheless, it is a small majority with non-painful cases being common. A CT scan might have been useful in looking for bony erosion suggesting metastases, but only 8/17 of the patients reported by Kline and Glaser had bony erosion on CT imaging.

The development of metastases without involvement of the liver and lungs certainly occurs with GI malignancies although it is notably unusual. Further it would be highly unusual for adenocarcinoma of the colon to present initially as metastases to the CNS or to the cavernous sinus or other meningeal structures. The neuroradiologic pitfall in our case may have been the symmetric involvement of the two cavernous sinuses that lulled the radiologists into believing there was no disease there.

Initial response to his chemotherapy regimen is not especially helpful. Camptosar and related compounds are used primarily for GI tumors but have been studied in late, refractory hematologic malignancies. The response of meningeal metastases to any systemic chemotherapy is usually not promising so the improved MRI findings were surprising when seen.

References


