Intracanalicular meningioma with normal tomography

Case report

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A middle-aged woman presented with the typical symptoms and signs of a compressive optic nerve lesion. Plain skull films, tomography of the optic canals, and selective angiography with magnification and subtraction were normal. Computerized transaxial tomography clearly showed the tumor, which was a meningioma of the optic nerve sheath. At surgery the tumor was found within the optic canal with intracranial and orbital extensions. It was strictly intradural and did not involve the surrounding bone at any point. This case documents the fact that an intracanalicular meningioma may be associated with normal tomograms of the optic canal.

KEY WORDS □9 meningioma □9 optic nerve □9 tomography

According to "Walsh's Dictum" progressive loss of vision in one eye is due to a compressive lesion of the optic nerve. In a classic paper on this subject, Little, et al., 2 recommended surgical exploration despite negative neuroradiological procedures. More recently Knight, et al., 1 stated that with the use of polytomography of the sella and canals, pneumotomography, and selective angiography with magnification and subtraction, even the smallest prechiasmal tumors could be detected.

The patient reported here had a meningioma that involved the intracranial optic foramen and the entire length of the optic canal, but showed no radiological changes on tomography. Selective angiography was also normal. The computerized transaxial tomography (CT) scan was strikingly positive, and obviated pneumotomography. Although pneumotomography was not performed, it is unlikely that it would have shown the small intracranial extension of this meningioma. We wish to emphasize that a tumor can, in fact, be present within the optic canal despite normal tomography.

Case Report

This 44-year-old woman presented to Walter Reed Medical Center in November, 1975, with a chief complaint of painless, progressive loss of vision in the left eye over a 10-month period. An evaluation in May, 1975, showed that she had 20/40 vision in the
Examination. The visual acuity was 20/15 in the right eye and 5/200 in the left eye. Visual fields were normal on the right, but on the left a large central scotoma was found to break out inferiorly in an altitudinal fashion (Fig. 1). A 3+ Marcus Gunn pupil was present and the left disc showed marked edema with optic atrophy. The right disc was normal. Motility was completely normal and there was no proptosis.

Routine skull x-ray films with optic canal views (Fig. 2) and tomography of the optic canals (Figs. 3 and 4) were entirely normal. Selective angiography revealed a normal caliber ophthalmic artery. The height of the optic nerve was normal as estimated from the vertical portion of the artery as it crossed over the nerve. No abnormal vasculature or stain was noted, although there was equivocal flattening of the choroidal blush. The cavernous internal carotid and its cerebral branches and the external carotid were normal. A CT scan was interpreted as showing diffuse enlargement of the left optic nerve within the orbit (Fig. 5).

Operation. Under general anesthesia, the roof of the left orbit was exposed extradurally through a standard left frontal craniotomy. Hyperventilation and spinal drainage improved exposure. With the orbit unroofed, the optic nerve was visualized throughout its intraorbital course and appeared normal. The remainder of the procedure was carried out under magnification provided by the operation microscope. The dural sheath of the optic nerve was opened throughout its intraorbital course. Growing within the subdural space of the posterior one-third of the nerve was a small strand of tumor tissue, which extended beyond the exposure toward the optic canal. It was reddish-purple, friable, and in most areas not particularly adherent within the orbit to either nerve or dura. The dura over the
Meningioma of optic canal

FIG. 3. Tomography of right optic canal done at 2-mm intervals. Beginning at the upper right, the series proceeds from cranial (scan 1) to orbital (scan 6) end of canal in a clockwise fashion. A representative cranial portion of the canal (long axis horizontal) is indicated in scan 1 (arrow); and a representative orbital portion of the canal (long axis vertical) in scan 5 (arrow).

FIG. 4. Tomography of left optic canal done at 2-mm intervals. Beginning at the upper right, the series proceeds from cranial (1) to orbital (6) end of canal in clockwise fashion. Arrow in scan 2 indicates cranial optic canal; arrow in scan 6 indicates orbital optic canal as in Fig. 3.

The orbital surface of the frontal lobe was then opened and the intracranial extension of the same tumor immediately came into view. The tumor was about the size of an aspirin tablet and surrounded the optic nerve as it emerged from its foramen like the head of a mushroom. The tumor did not involve other structures and was only loosely attached to the dura intracranially. The roof of the optic canal was then removed and the dura within the canal opened (Fig. 6). Within the canal the tumor was adherent to both dura and nerve. The tumor seemed to have arisen from the meninges of the optic canal and subsequently grew along the subdural plane intracranially as well as into the orbit. Pressure of the tumor on the nerve within the canal was probably responsible for the loss of vision.

Because the right eye had been functionally blind for some months before surgery, we elected to remove the nerve, complete with its dural sheath, en bloc from just in front of the chiasm to 2 cm behind the eyeball to ensure complete removal of all tumor cells. The bone of the optic canal appeared normal under X 40 magnification. The wound was then closed. The postoperative course was uneventful.
FIG. 5. Computerized transaxial tomography scan. Initially this was interpreted as showing a diffusely enlarged optic nerve within the orbit. In retrospect, however, a small nubbin of tumor can be seen at the intracranial end of the optic canal (arrow).

Discussion

The unilateral progressive visual loss and afferent pupillary defect in our patient were compelling evidence of a compressive lesion of the optic nerve. The marked disc edema suggested an intraorbital tumor and the normal tomography of the sella and canals reinforced this clinical impression. Although selective angiography revealed no definite abnormalities, there was equivocal indentation of the choroidal blush consistent with an intraorbital mass lesion. The CT scan (Fig. 5) was initially interpreted as showing a diffusely enlarged optic nerve within the orbit, consistent with an intraorbital meningioma.

Susac, et al., recently reported their experience with meningiomas occurring in the apex of the orbit. They described four women who presented with unilateral progressive visual loss in association with the typical findings of optic nerve compression. Orbital signs were conspicuous by their absence. Skull x-ray films, tomography of the sella and canals, selective angiography, and pneumoencephalography were normal. The tumor was demonstrated by CT in two patients, but the scan was negative in one. In the patient with the negative CT scan, surgical exploration revealed a meningioma in the posterior orbit just anterior to the optic foramen. They emphasized that this region was neuroradiologically silent and, in spite of failure to demonstrate the meningioma in one case, their results showed the importance of CT in such cases.

In our patient we expected to find an intraorbital meningioma at surgery, but were surprised to find very little tumor in the orbit. The intraorbital optic nerve was normal in size and the CT scan was misleading in this regard. The tumor appeared to have arisen from the meninges of the optic canal and then spread intradurally into the orbit and also intracranially (Fig. 6). The bulk of the meningioma was at the intracranial portion of the canal and in retrospect, the CT scan probably demonstrated this portion of the tumor (Fig. 5). The meningioma was entirely intradural and did not invade or distort bone at any point.

References


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