SPHENOIDAL RIDGE MENINGIOMA WITH OPTIC NERVE METASTASIS*†

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MENINGIOMA, usually described as a relatively benign localized lesion, may spread by invasion locally, involving dura, venous sinus, brain, and particularly bone, with osteolysis or hyperostosis. Spread by lymphatic paths is rare, as is extension by the cerebrospinal fluid. These tumours may behave in a malignant fashion, with extracranial metastases. Haematogenous generalized metastases, though quite uncommon, do occur, particularly after repeated operations, and multiple primary meningiomata can occur as in the patient reported below.

Case Report

A married woman aged 39 had noticed poor vision in the left eye for 2 months. This was not associated with pain although she experienced occasional bilateral frontal headaches.

Examination.—The visual acuity was 6/5 in the right eye and 6/60 in the left. The left pupil was larger than the right with diminished reaction to light. The left optic disc showed "generalized pallor with distinct outline". The left central visual field showed "centro-caecal scotoma to 7 mm. white/2000, nasal hemianopia to 30 and 7 mm. white/2000". The right field was normal.

There was right-sided emotional facial weakness, otherwise the general and neurological examinations were normal.

LUMBAR PUNCTURE: Pressure 240 mm., no cells, normal chemistry.

RADIOGRAPH: Erosion of left anterior clinoid process.

CAROTID ARTERIOGRAM: The right side was normal, whereas the left demonstrated a vascular tumour posterior to the sphenoidal ridge causing marked attenuation of the carotid artery (Fig. 1, opposite), with displacement backwards and to the right of the anterior cerebral artery. The transverse extent of the tumour is well seen in the antero-posterior projection (Fig. 2, opposite), and the abnormal fine tumour vessels (so-called "tumour blush") are quite evident.

The neuro-surgeon considered that the lesion was "very formidable" with "very ominous attenuation of the internal carotid artery".

Operation.—Utilizing hypothermia, the tumour was subtotally removed from the inner part of the sphenoidal ridge.

Termination.—The patient subsequently developed severe right hemiplegia and aphasia, and then abruptly deteriorated with signs of tentorial herniation. Emergency arteriography disclosed complete obstruction of the left internal carotid artery just within the skull and she died a few hours later.

* Received for publication July 7, 1967.

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FIG. 1.—Left carotid arteriogram.

FIG. 2.—Antero-posterior projection of left carotid arteriogram.

Post Mortem Examination

There was mild right pulmonary oedema.

BRAIN: There was softening of the left cerebral hemisphere with some laceration of the left temporal pole. The sphenoidal ridge was "raw", with little residual tumour except around the region of the internal carotid artery, the narrow residue of the lumen of which was thrombosed. On the left orbital plate was a small isolated nodule of meningioma tissue measuring $3 \times 2 \times 2$ mm.

Histology

SPHENOIDAL RIDGE: Very vascular meningioma residue, with endotheliomatous and syncytial areas on the dura. Underlying bone infiltrated (Fig. 3, overleaf). Tumour presents a loose-textured meningotheelial appearance with areas of syncytial and psammoma body formation. Tumour extends into the optic canal and some meningioma tissue is adherent to the external surface of the optic nerve sheath.

ORBITAL PLATE: A small discrete nodule of meningioma is present on and through the dura, with extension into the underlying bone and connecting with the sphenoidal ridge lesion. Occasional plump cells are present near a well-circumscribed patch of demyelination of the optic nerve and the external surface of the optic nerve sheath is infiltrated by the meningioma.

INTRA-ORBITAL OPTIC NERVE: No abnormality noted in the section. Myelination is intact.

FIG. 3.—Section of sphenoidal ridge, showing infiltration of bone.

FIG. 4.—Section of optic nerve, showing a loose-structured meningioma (M) arising from the optic nerve sheath.

FIG. 5.—Section of posterior part of the globe (high-power magnification of part of Fig. 4), showing detached retina (above), exudate, and tumour tissue (below).

LEFT EYE (Fig. 4, opposite): Some 15 mm. of optic nerve is present, and the proximal 9 mm. appears normal. The terminal 6 mm. contains within it and arising from the optic nerve sheath a loose-structured meningioma (M) which extends through the lamina cribosa and invades beneath the retina at the level of the pigmentary epithelium for a distance up to 1 cm. from the edge of the optic disc. Proteinaceous exudate has formed between the tumour and the retina.

Fig. 5 (opposite) shows the detached retina above, exudate centrally, and tumour below.

Comment

Optic nerve tumour is a rare cause of optic atrophy. The presence of a meningioma in the distal optic nerve extending into the choroid, in association with sphenoidal ridge meningioma of the same side and not apparently directly connected with it, makes one speculate how it developed there. Serial sections would be necessary to exclude direct extension with certainty. Spread *via* the cerebrospinal fluid or, more likely, *via* the ophthalmic artery or central retinal vein could have occurred. The lesion could be another separate primary meningioma, as the multi-centric origin of these tumours is well known.

Summary

A patient is described who presented and died with an inner third sphenoidal ridge meningioma. Histological examination of the atrophic optic nerve showed a meningioma deposit, probably metastatic in nature, but possibly primary.

I gratefully acknowledge the assistance of Mr. D. A. Simpson (neurosurgeon) and Dr. K. D. Murray (pathologist).

REFERENCE

SIMPSON, D. (1957). "Studies on the Treatment of Meningiomas". M. S. Thesis, University of Adelaide.