Nasal Gliomas: A Report of Five Cases with Electron Microscopy of One*

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Nasal glioma has been defined by Black and Smith as:

"a mass of glial tissue of congenital origin that occurs intranasally and/or extranasally at or near the root of the nose. It may or may not be connected to the brain by a pedicle of glial tissue, but it does not contain a fluid-filled space connected with either the ventricles or the subarachnoid spaces of the brain."

Other terms that have been used to describe the lesion are glioma (astrocytoma), ganglioma, filroglioma, encephalochoriostoma, and encephaloma. Frank encephalocoeles or encephalomeningocoeles, as has been pointed out by Davis and Alexander, are readily recognizable as a neurosurgical problem. The recognition of the less obvious nasal glioma is not so easy and requires the cooperation of rhinologists and neurosurgeons to assure proper diagnosis and treatment. This report reviews some of our cases together with those in the literature, a description of the pathological specimens, including electron microscopy of 1 case, and our conclusions regarding the management of nasal gliomas.

Case Reports

Case 1. D.P.C., a 6½-month-old white boy, was admitted to the Ear, Nose and Throat Service of Dr. Joseph Ogura at St. Louis Children’s Hospital on Feb. 7, 1961 with a history of progressive right nasal obstruction and occasional clear nasal discharge for 3 months.

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Examination revealed a large right parasellar mass which was firm, pink, and covered by normal mucosa, extending down to within a centimeter of the right nasal opening. The child otherwise was normal. Roentgen-ray studies revealed no definite bony defects, even with laminography.

A biopsy was performed on Feb. 8, 1961 which revealed glial and fibrous tissue with no neurons seen.

The child had no rhinorrhea and was discharged on antibiotics.

He was re-admitted and transnasal excision of the lesion was carried out on March 1, 1961. The mass was seen to extend upward through a defect in the cribriform plate. Escape of cerebrospinal fluid was noted and the patient was transferred to the Neurosurgery Service.

Right frontal craniotomy was performed 3 hours later. The dura mater was adherent to the right cribriform plate. A band of gliotic tissue extended from the frontal lobe along an hypertrophied olfactory bulb through a hole, 5 mm. x 10 mm. in size, in the cribriform plate and dura mater. This tissue was cut across and the portion extending into the nose was excised. The dural defect was closed with a dural flap and a patch of muscle. The bony defect was filled with methacrylate and covered with Gelfoam.

Pathological specimens showed disorganized gliotic tissue covered by nasal epithelium and glands and infiltrated with inflammatory cells. Glial tissue merged imperceptibly with cerebral cortex in the proximal portion of the specimen.

The child did well postoperatively with no meningitis or rhinorrhea. He was given antibiotics for 10 days, and discharged to return for final excision of residual nasal tissue on May 17, 1961. This was done without complication. Only chronic inflammatory tissue was present in this specimen. The child has had no further difficulties.

Case 2. M.M., a 3-year-old girl, was hospitalized on the Ophthalmology Service in February 1952 because of right esotropia which had been noted first at the age of 6 months. The right eye was amblyopic and there was right microphthalmos.

A muscle-recession operation was performed, and was repeated 13 months later, with good result.

In September, 1956, she was admitted to the
Ear, Nose and Throat Service with a firm mass in the right nostril. Roentgenograms showed a soft-tissue mass in the right ethmoid region and nasal fossa, with deviation of the septum to the left. The right maxillary and ethmoid sinuses were small.

Biopsy of the nasal mass revealed only chronic inflammation and fibrosis.

Three days later meningitis developed. Cultures of spinal fluid yielded no growth. Tuberculin test was positive. Rapid clearing of the meningitis followed vigorous antibiotic therapy, and she was discharged 2 weeks later.

Fullness of the right side of the nose remained unchanged over the next several years. Lamina- grams in June 1959 revealed slight thinning of the right cribiform plate which was considered to be compatible with the congenital hypoplasia of the right maxillary and ethmoid sinuses.

In January 1962, the child (now 13 years old) was re-admitted to the Ear, Nose and Throat Service because of slight increase in the right nasal mass. Repeated roentgen-ray studies showed no significant changes. Spinal fluid was normal. Pneumoencephalography showed no air in the olfactory cistern. Because of the bout of meningitis occurring after intranasal biopsy of the tumor in 1956, craniotomy was thought to be the procedure of choice.

A right frontal craniotomy was done, using a coronal incision of the scalp. The dura mater was adherent to the medial wall of the orbit and cribiform plate. Two defects in the bone were found—one in the cribiform plate and the other in the medial inferior portion of the orbital plate. Through these defects extended gliotic tissue in direct continuity with the frontal cortex. Portions of this tissue were removed, the bony defects were packed with methacrylate, and the dura mater was closed.

The patient did well postoperatively. She was given antibiotics and had no meningitis or rhinorrhea. She returned 2 months later for excision of the intranasal tumor. Specimens from both operations revealed glial tissue with a few neurons present. Her course has been uncomplicated.

Case 3. K.C., a 6-week-old girl, was admitted to the Otolaryngology Service on Oct. 30, 1962 with a complaint of a polyposid mass presenting in the right nostril since birth (Fig. 1). She had no respiratory difficulty, and no rhinorrhea had been noted. The mass had not changed in size. The child ate well and was developing normally. Roentgenograms revealed no bony defect in the nasofrontal area.

An intranasal biopsy was performed on Nov. 1, 1962. The mass was adherent to the nasal cavity laterally as well as medially. When a probe was passed upward a defect was palpable in the cribiform plate.

After the biopsy the patient was transferred to the Neurosurgery Service and a right frontal craniotomy was performed immediately, using a coronal incision. A defect was found in the dura mater and right cribiform plate. There was grey tissue lying in the bony defect but no definite connection between this tissue and the brain could be demonstrated. The dura mater was sutured and methacrylate was placed in the bony defect.

The specimens contained glial tissue with a few neurons.

Four days postoperatively there was some purulent discharge from the nose and fever developed. Spinal fluid on Nov. 5, 1962, revealed 2 cells with protein of 57 mg. per cent and sugar 56 mg. per cent. Aspiration of the scalp yielded 40 cc. of sanguinopurulent, material, cultures of which were found to contain paracolon bacilli. The subgaleal pus was very similar to that draining from the nose.

On Nov. 9, 1962, secondary craniotomy was performed with drainage of subgaleal, extradural and subdural pus, cultures of which yielded paracolon bacilli sensitive to penicillin and kanamycin.

Following this procedure antibiotics were injected through two catheters using 10,000 units of penicillin and 10 mg. of kanamycin daily for 4 days. Subsequently the wound healed without further complication. There was no rhinorrhea and the patient was discharged on Nov. 26, 1962.

She returned on Feb. 12, 1963, and the following day the mass remaining in the right nostril was removed. At this transnasal operation, Dr. Ogura was able to visualize the undersurface of the methacrylate plate and on palpation found it to be immovable, with no evidence of any leakage. Sections of the mass removed from the nose revealed it to be similar to the specimen removed intracranially. The patient was discharged on Feb. 18, 1963, with no neurologic abnormalities.