

Nasal Glioma: A Case Report and Review of Literature

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ABSTRACT

The nasal glioma is one of the rare-dysplasia disease that mainly happen in the early stage of infancy or young children. And now many scholars consider that nasal glioma is mainly composed by the brain tissue and meninges protruding to the nasal cavity during the development of skull base, included dura mater, pia mater, arachnoid and disconnect with the intracranial during the development. We reported a case of misdiagnosed preoperatively and confirmed after the surgery in our hospital. Besides, we made a summary of the epidemiology, clinical features, imaging and pathological features of nasal glioma and the state of treatment nowadays.

Introduction

Nasal glialheterotopia (NGH), also called nasal glioma [1-5], which is a glial heterotopia outside the brain belonging to congenital nasal neuroectodermal tumor [6]. However, the mechanism of nasal glioma still remained unclear. Two main theories may explain NGH development. The widely accepted theory is the herniation of tissue through the fonticulus frontalis of foramen cecum [7]. Many scholars consider that nasal glioma is mainly composed by the brain tissue and meninges protruding to the nasal cavity during the development of skull base [2], included dura mater, pia mater, arachnoid and disconnect with the intracranial during the development [3], Glial heterotopia mainly happens on male, the ratio of male: female was 2:1, without any familial tendency. From the accessory examination system, MRI examinations are more better than CT for chosen [1,11-14]. And now we cannot clearly identify the difference between the meningeal and nasal glial heterotopia on pathologic features. Surgery was the first treatment; early surgical intervention can reduce complications such as meningitis, intracranial abscess and facial changes.

Case Presentation

A 10 years old child present with progressive congestion of right nasal cavity, mouth breathing in sleep, continue purulent nasal discharge, without bloody rhinorrhea, no sneezing, no olfactory change or headache. The specialized otorhinolaryngologic examination revealed no abnormal of external nose, and a smooth red mass in the right nasal cavity which compressed the septum to the left side. Under the 0-degree nasal endoscopy, we can see a red smooth mass in the right nasal cavity, the base of mass seems at the top of the nasal cavity

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Figure 1: A: we can see a pale and smooth mass in the right nasal cavity by endoscopy B: the base of the mass is unclear; C: the mass suppresses the nasal septum deviation to the other side.

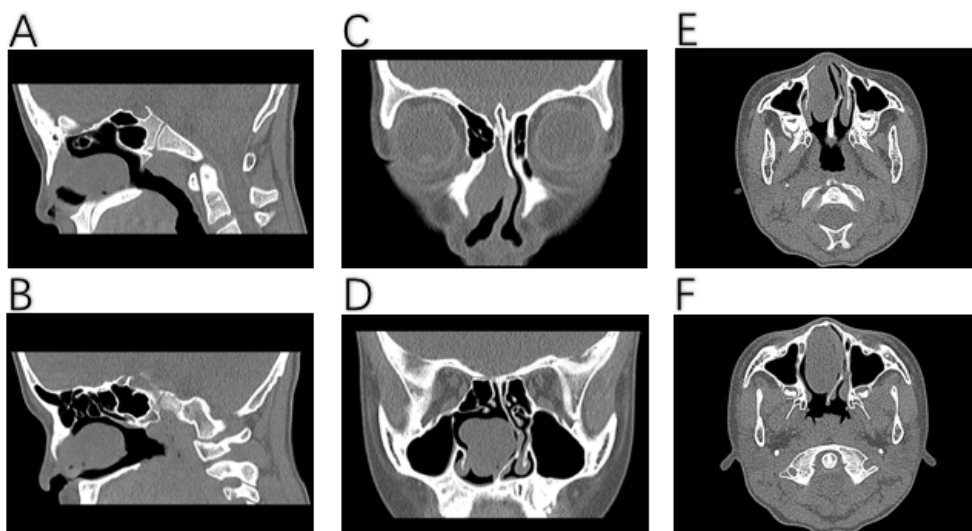


Figure 2: Preoperative sinus CT, A, B: in sagittal view, the base of the mass is suspected to be near the inferior foramen; C, D: in the coronal view, the root of the mass can be observed and the mass compresses the nasal septum deviation; E, F: in the horizontal position, the root of the mass can also be observed from the top of the ethmoid.

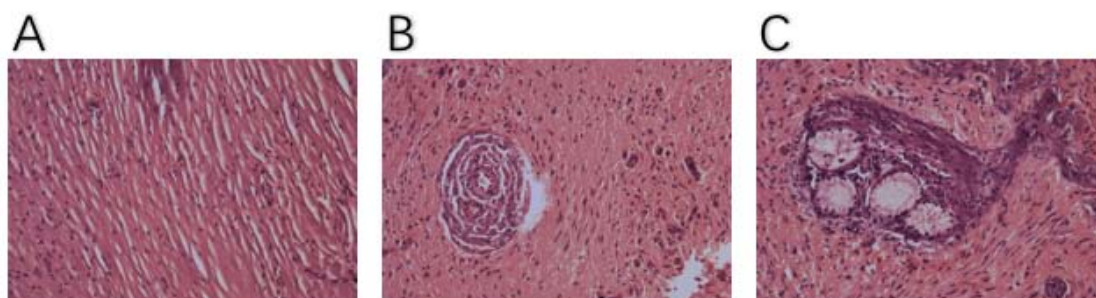


Figure 3: Pathological findings of tumor: A: normal brain tissue can be observed, including a large number of glial cells (He *200); B: vascular stroma (He *200); C: normal nasal glands are visible (He *200).

(Figure 1). From the paranasal sinus computed tomography the mass seems located from the frontal blind hole (Figure 2). The kid was applied a transnasal endoscopic surgery. The mass was completely resected and the size of it was approximately 4*4 cm with smooth borders. Its location was in the right nasal cavity around frontal blind hole. We found the mass was cystic structure with clear water inside. After removal of the mass, there is no clear discharge seen during the operation. The pathological examinations revealed that it is the nasal glioma, included meningoencephalocele (Figure 3). The one month follow-up examination and magnetic resonance imaging (Figure 4) revealed no residue or CSF (cerebrospinal fluid) rhinorrhea.

Glial heterotopia mainly happens on male, the ratio of male: female was 2:1, without any familial tendency. According to the location of mass, it can present as three forms, including an internal nasal mass (30%), external nasal mass (60%) and mixed lesion (10%) [1]. The majority of intranasal lesions arising from the lateral nasal wall of middle turbinate and seen as pale masses; they also can arise from septum [1]. In rare reports, glioma may extend into the orbit, frontal sinus, oral cavity or nasopharynx [8]. 15% to 20% of nasal gliomas have a fibrous stalk connecting to the central nervous system [9]. The case of the 10 years old child, with progressive nasal obstruction and suppressed the septum deviation.

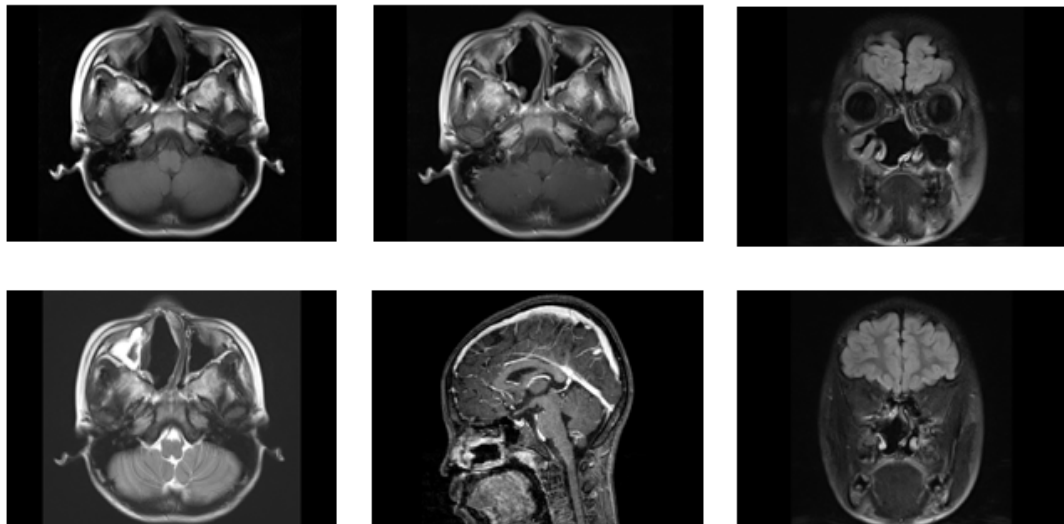


Figure 4: Postoperative paranasal sinus MRI, A, B, C, D, E, F: without any cerebrospinal fluid rhinorrhea and tumor residual.

Discussion and Review

As the child had not the rhinorrhea and meningitis in our case, and the shape of the mass was not consistent with the meningocele under endoscopy, a provisional diagnosis of nasal cyst was set [1,3,8]. We could find the base of mass may come from the foramen cecum, but could not estimate the base of the mass exactly. Due to the mass demonstrated expansive growth and the long medical history, we thought the mass was a benign tumor.

1. The epidemiology and clinical characteristics

2. Radiography characteristics

The imaging method for diagnosing glial heterotopia include: B ultrasound, computed tomography, magnetic resonance. B ultrasound could be used as the prenatal diagnosis of nasal glioma, which present on ultrasound as a solid frontonasal mass with characteristic end-diastolic low arterial flow velocity on Doppler imaging [10]. On MRI, it is discontinuous with the brain parenchyma as compared to encephaloceles. The nasal glioma shows more hyperintense on T2 relative to normal brain parenchyma. As the ionizing radiation is at risk of

cancer for pediatric patients, who are suspected of nasal glioblastosis, the MRI examinations are better than CT for chosen [1,11-14]. In the above case, due to the patients did not finish the preoperative Sinus CT with enhancement or MRI scan with enhancement; it could not be sure the base of the tumor. While the characteristic expansive growth of the tumor, clinical consideration the possibility of benign lesions.

3. Pathologic features

Nodular or polypoid shapes, smooth surface, gray pink are the pathology characteristics of the nasal glial heterotopia. Sometimes there is cyst containing fluid-like liquid. Under the microscopic, we cannot see the meningeal wrap, the tumors are covered with nasal mucosa, including the blood vessels, dense fibrous connective tissue and mature glial cells and oligodendrocytes. Sometimes it includes the neurons and ependymal cells. And the indicators S100 and GFAP by immunohistochemical test can be used to definite whether the cell source is from the glial [7,15,16]. The pathologic present as more fibrous connective tissue or glial composition is not obvious with long medicine history. We cannot clearly identify the difference between the meningeal and nasal glial heterotopia. In the above case, the tumor preferred to more fibrous connective tissue than the glial cells, due to the long medicine history.

Differential Diagnosis

1. Meningocele

Meningeal encephalocele, nasal / nasopharyngeal pharyngeal cysts, nasogastric gliomas are the congenital mass derived from the nasal midline; due to the defect of skull base bony structure during the development which leading to cranial contents hernia out to the nasal cavity. The meningoencephalocele occurred in infants and young children, the incidence rate reach at 1: 3000-1: 12500 [17], without family genetic bias. Forty percent of patients were accompanied by other abnormalities. Meningoencephalocele in the nasal cavity, sometimes is soft, flexible; the nasal lump becomes bigger with crying or the pressure of the jugular vein increased, or the emergence of unilateral nasal clear

liquid outflow [11]. General intranasal meningocele is rarely found before the emergence of nasal congestion. It may be associated with cerebrospinal fluid rhinorrhea and meningitis.

2. Nasal / nasopharyngeal and pharyngeal cysts

Nasal / nasopharyngeal pharyngeal cysts with the highest incidence of occurrence in the congenital midline nasal tumor in the Asian population. The average incidence rate is 1/6000, male predilection. There is no relevant literature reported family relevance. Nasal dermoid cysts contain mesoderm and ectodermal components; when the dura mater during embryonic development cannot be recovered through the blind hole dura mater, it could lead to nasal dermoid cysts. Nasal dermoid cysts can also be divided into external and intranasal masses, vesicles, fistula. The clinical features of it includes: no pulsation, solid tumor, et al. The negative trans-illumination test can be used to differentiate it from meningocele. 4% -45% of dermoid cysts contain the presence of intracranial contents [11].

Conclusion

At present, nasal glial heterotopia needs ENT, neurosurgery and radiology multidisciplinary combination therapy. Surgical resection is the first treatment. Preoperative CT and MRI can provide tumor size, base, and intracranial communication, the surgical approach [4], such as the exclusion of the tumor and intracranial connection, the proposed endoscopic surgery [18]. Early surgical intervention can reduce complications such as meningitis, intracranial abscess and facial changes, long-term nasal glial heterotopia can lead to nasal septum deviation and other related issues.

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