Case report

Primary glioma of the parotid gland: a case report and the literatures review

ABSTRACT

Gliomas are by far the most common primary central nervous system tumours. So far, the most gliomas were reported to derive from CNS and located in cranium. Here we describe a rare case of glioma located in the parotid gland. The possible mechanisms of this tumor and its diagnostic investigation are discussed in the literature.

Keywords:Glioma; parotid gland

1.INTRODUCTION

Gliomas, which are by far the most common primary central nervous system (CNS) tumours, arise from the brain's supporting cells, or glia, with varying prognosis

depending on malignancy grade (or histologic differentiation), and its etiology is largely unknown[1]. So far, the most gliomas were reported to derive from CNS and located in cranium. Very few extracranial gliomas were reported, and most of them located in the nasal region[2]. Here we describe a rare case of glioma located in the left parotid gland. The possible mechanisms of this tumor and its diagnostic investigation are discussed in the literature.

2.CASE REPORT

A five-years boy was referred to the department of stomatology, the First People's Hospital of Chenzhou, Hunan province, China, complaining of a congenital mass in the left parotid region.

The boy was born with a grape-sized mass right anterior the left earlobe without any abnormal symptom. And he was born at full-term and had a normal vaginal delivery with no other abnormalities. No congenital abnormality was detected in his elder sibling and the family history was unremarkable. His mother denied any drug administration history and disease history during her duration of pregnancy. His parent thought the mass would resolve spontaneously with the boy's growth. However, five years later, the mass gradually enlarged and affected his appearance.

Physical examination revealed an approximately 3x2 cm, firm, moveable, noncompressible, nontender, nonpulsatile mass located right anterior the earlobe which buried in the parotid gland tissue. And no symptom of facial palsy was presented since his born. No pharyngeal wall bulging was detected. No abnormal

secretion discharged from the left parotid papilla. After the parotid region colour type-B ultrasonic and maxillofacial region and head CT scan, the mass was detected and located in the deep lobe of the left parotid with mixed characteristics and there was not any intracranial extension or evidence of defect at the base of the skull. But the boy was extremely reluctant to accept the fine-needle biopsy under the guide of type-B ultrasonic. The mass was then diagnosed as left parotid gland benign tumor, and the pleomorphic adenoma may be the most possible diagnosis.

The patient was admitted to the hospital in July and underwent surgery under general anesthesia. The parotidectomy was performed to remove the mass and the left parotid gland. The tumor was 3x3x2 cm in diameter and appeared with an unbroken capsule, lobulated, and fairly firm, with grayish white cut surfaces in the deep lobe of the parotid gland. The intra operation rapid frozen section diagnosis was parotid benign tumor. Therefore the facial nerve was preserved intactly to keep the normal emotive function. Seven days after operation the surgical incision cured.

For the microscopic examination, the section of paraffin presented the characteristic of glioma. The fibrillary stroma was seen at higher magnifications. The individual glial-like cells, which had the characteristics of astrocytes, had very regular round nuclei, sharp nuclear membranes, and usually a single conspicuous nucleolus. Then the immunohistochemical analysis of the glial fibrillary acidic protein (GFAP), S100, vimentin (Vim), epithelial membrane antigen (EMA), and pan cytokeratin AE1/AE3 were preformed to confirm the pathological diagnosis. The GFAP, S100, and Vim staining, which could identify neurological cells with high specificity, were positive.

And the staining of GFAP was diffused. Epithelial membrane antigen was negative in lesional cells. And postoperation MRI of the brain was processed to exclude the intracranial glioma, however, no abnormal image finding was observed. Hence, a definitive diagnosis of primary parotid gland glioma was made, and the pathological degrade was defined as WHO grade I. Now, almost 9 years after the operation, the patient is of good health condition, without any signs of the relapse and complications.

3 .DISCUSSION

The parotid glands, the largest salivary glands, are found on each side of the face, just in front of the ears. The most tumors derive from parotid gland are benign. And the benign tumors mainly consist of pleomorphic adenomas and Warthin tumors. The parotid gland malignant tumors include carcinomas, malignant lymphomas and intraglandular metastases. [3] There were several literatures [4-6] reported that the glioma in parotid gland which derived from the metastasis from the endocranial glioma. Despite its aggressive nature in pathology, the clinically extracranial parotid metastases are detected rarely, and the most common sites of metastatic spread in order of frequency are the lungs and pleura, mediastinal and cervical lymph nodes, bones and the liver.[7] The parotid gland metastasis may due to the iatrogenic seeding or hematogenous spread.[6] Otherwise, the excranial glioma reported mostly was nasal glioma. Nasal gliomas are usually regarding as a rare congenital frontonasal lesions estimated to occur in 1: 20,000 - 40,000 live births with a male:female ratio of

3:2 [8]. However, adult was also reported.[9] It was reported in American, England, Indian districts, and et al.[10-12] Approximately 60% of nasal gliomas are extranasal, 30% are intranasal, and 10% are extranasal with intranasal extension. Nasal gliomas are not true neoplasms. They originate from ectopic glial tissue left extracranially following abnormal closure of the nasal and frontal bone during embryonic development.[13] Histologically, nasal gliomas are composed of astrocytes and neuroglial cells, embedded in fibrous and vascular connective tissue.[8] Here we describe a primary parotid gland glioma, which hasn't reported in previous literature.

In this patient, after the CT scan, neither intracranial extension nor evidence of defect at the base of the skull was detected. And the MRI scan further excluded the primary intracranial glioma. The medical history indicated that the boy was born with the parotid mass. So it is supposed that the neural tissue cell sequestrated in the parotid tissue or ectopic neural tissue cells during the embryo may contribute to the mechanism of the primary glioma of parotid gland. Embryologically, the parotid is the first gland to make its appearance at week 6 of gestation. It originates from buds in the posterior stomodeum, which elongate forming solid cords (it is therefore of ectodemal origin). Cords extend laterally through the mesenchyme across the developing masseter muscle toward the ear. Cords canalize and form ducts, and their distal portions form acini. Surrounding mesenchyme forms the capsule of the gland at a relatively late development stage. [14] The brain tissue mostly originates from the ectoderm. So during the period of embryo, the brain tissue may heterotopically grow in the tissue or the organ beside the brain. The heterotopic brain tissue was also

reported in the scalp [15], orbit [16], lip [17], tongue [18], palate [19], pharynx [20], and et al.

Grade I gliomas are slow growing and relatively benign. The treatment for small tumors and tumors located in areas that are not suitable for surgery may be observed. While surgical treatment was chosen for most cases. Complete surgical remove usually could be curative. For tumors that are unable to be surgically removed or recurrent tumor, the radiation-reserved was an effectively adjunctive therapy. The 9 years follow-up after operation, the patient is of good health condition, without any signs of the relapse and complications

4.CONCLUSION

Though the most tumors derive from parotid gland are benign, the glioma would be also consider for the congenital parotid mass which is a rare anomaly. The CT or MRI of the brain must be done to exclude any intracranial metastases before performing a surgical procedure. And the fine-needle biopsy under the guide of type-B ultrasonic may supply more diagnosis information. Complete surgical excision seems to be the mainstay of the management of a parotid glioma which located in the deep lobe of parotid.

Ethical Approval:

As per international standard , written ethical approval has been collected and preserved by the author(s).

CONSENT

As per international standard or university standard, patient's consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Fisher JL, Schwartzbaum JA, Wrensch M, Wiemels JL. Epidemiology of brain tumors. Neurol Clin 2007;25:867–90.
2. Rahbar R, Resto VA, Robson CD, Perez-Atayde AR, Goumnerova LC, McGill TJ, et al. Nasal Glioma and Encephalocele: Diagnosis and Management. Laryngoscope,2003;113:2069–77.
3. Seifert G, Sobin LH. Histological typing of s alivary gland tumours. Springer, Berlin, 1991,pp 9–38.
4. Ogungbo BI, Perry RH, Bozzino J, Mahadeva D. Report of GBM metastasis to the parotid gland. J Neurooncol 2005;74:337–8.
5. Taha M, Ahmed A, Wharton S, Jellinek D. Extracranial metastasis of glioblastoma

multiforme presenting as acute parotitis. Br J Neurosurg 2005;19:348–51.

6. Kraft M, Lang F, Braunschweig R, Janzer RC. Parotid gland metastasis from glioblastoma multiforme: a case report and review of the literature. Eur Arch Otorhinolaryngol 2008;265:709–11.
7. Pasquier B, Pasquier D, N'Golet A, Panh MH, Couderc P. Extraneural metastases of astrocytomas and glioblastomas: clinicopathological study of two cases and review of literature. Cancer 1980;45:112–25.
8. Strauss RB, Callicott JH, Hargett IR. Intranasal heterotopia. So-called nasal glioma. Am J Dis Child 1966;111(3):317-20.
9. Xie C, Hampal S, Li C. Adult nasal gliomas. J Laryngol Otol 2015;129(3):282-92.
10. Chandna S,Mehta MA, Kulkami AK. Nasal Glial Heterotopia with cleft palate. J Indian Assoc Pediatr Surg 2018;23(1):39-41.
11. Friel MT, Flores RL. Resection of Nasal Glial Heterotopia Using a Nasal Subunit Approach. Ochsner Journal 2018:18;176–179.
12. Boyer AC, Anant Krishnan A, Goncalves LF, Williams L, Chaiyasate K. Prenatal Diagnosis of Nasal Glioma Associated with Metopic Craniosynostosis: Case Report and Review of the Literature. Radiology Case 2015;9(4):1-8.
13. Uzunlar AK, Osma U, Yilmaz F, Topcu I. Nasal glioma: report of two cases. Turk J Med Sci 2001;31:87–90.
14. Johns. The salivary glands: anatomy and embryology. Oto Clin North Am 1977;10:261–71.
15. Zook EG, Nickey WM, Pribaz JJ. Heterotopic brain tissue in the scalp. Plast

Reconstr Surg 1984;73:660–3.

16. Elder JE, Chow CW, Holmes AD. Heterotopic brain tissue in the orbit: case report. Br J Ophthalmol 1989;73:928–31.

17. Pasyk KA, Agenta LC, Marks MW, Friedman RJ. Heterotopic brain presenting as a lip lesion. Cleft Palate J 1988;25:48–52.

18. Knox R, Pratt M, Garvin AJ, White B. Heterotopic lingual brain in the newborn. Arch Otolaryngol Head Neck Surg 1989;115:630–2.

19. Al-Nafussi A, Hancock K, Sommerlad B, Carder PJ. Heterotopic brain presenting as a cystic mass of the palate. Histopathology 1990;17:81–4.

20. Okulski EG, Biemer JJ, Alonso WA. Heterotopic pharyngeal brain. Arch Otolaryngol 1981;107:385–6.

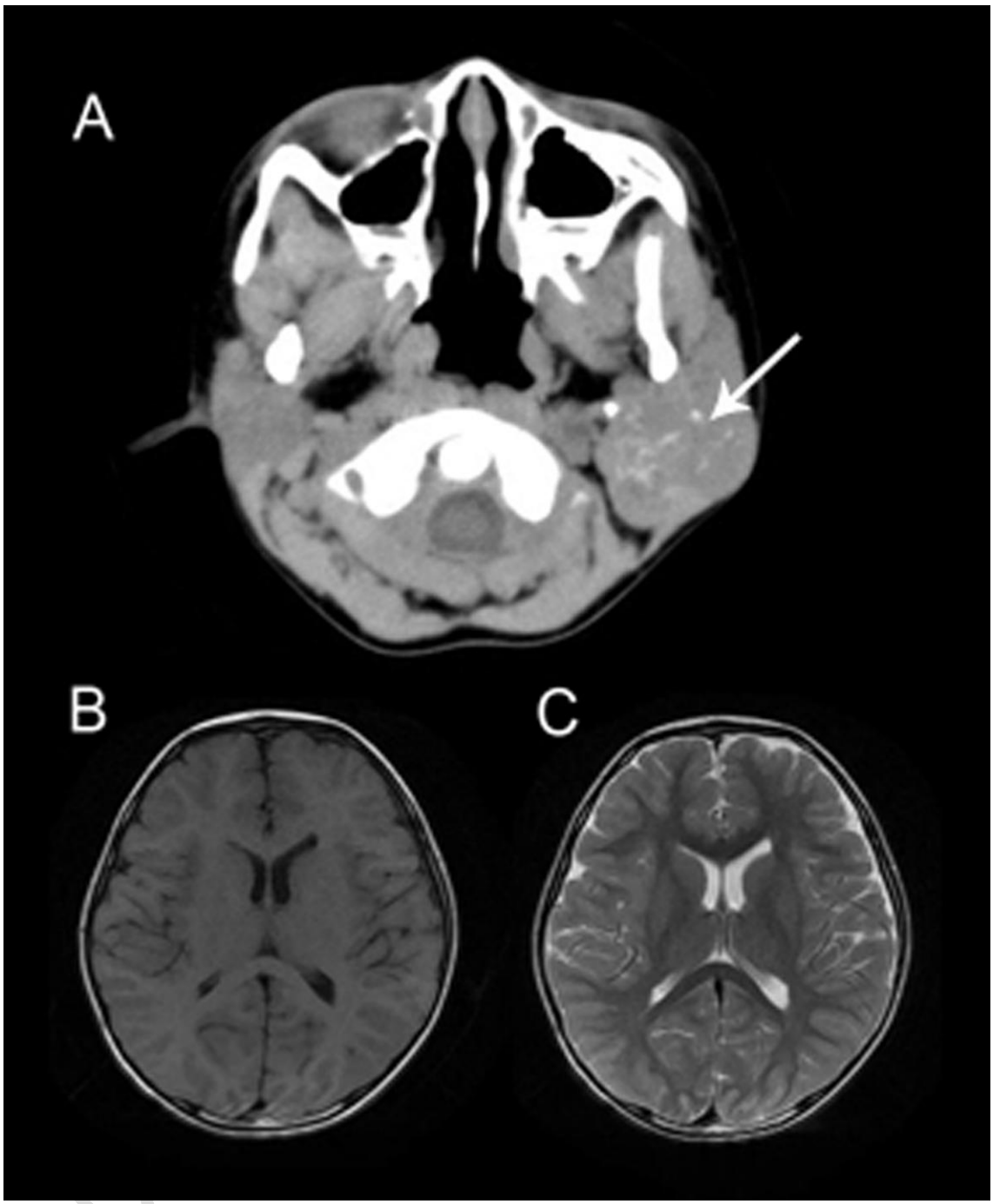

Figure. 1 The CT scan which showed a mass located in the deep lobe of left parotid gland. (A) The MRI scan which showed the normal images. (B,C)

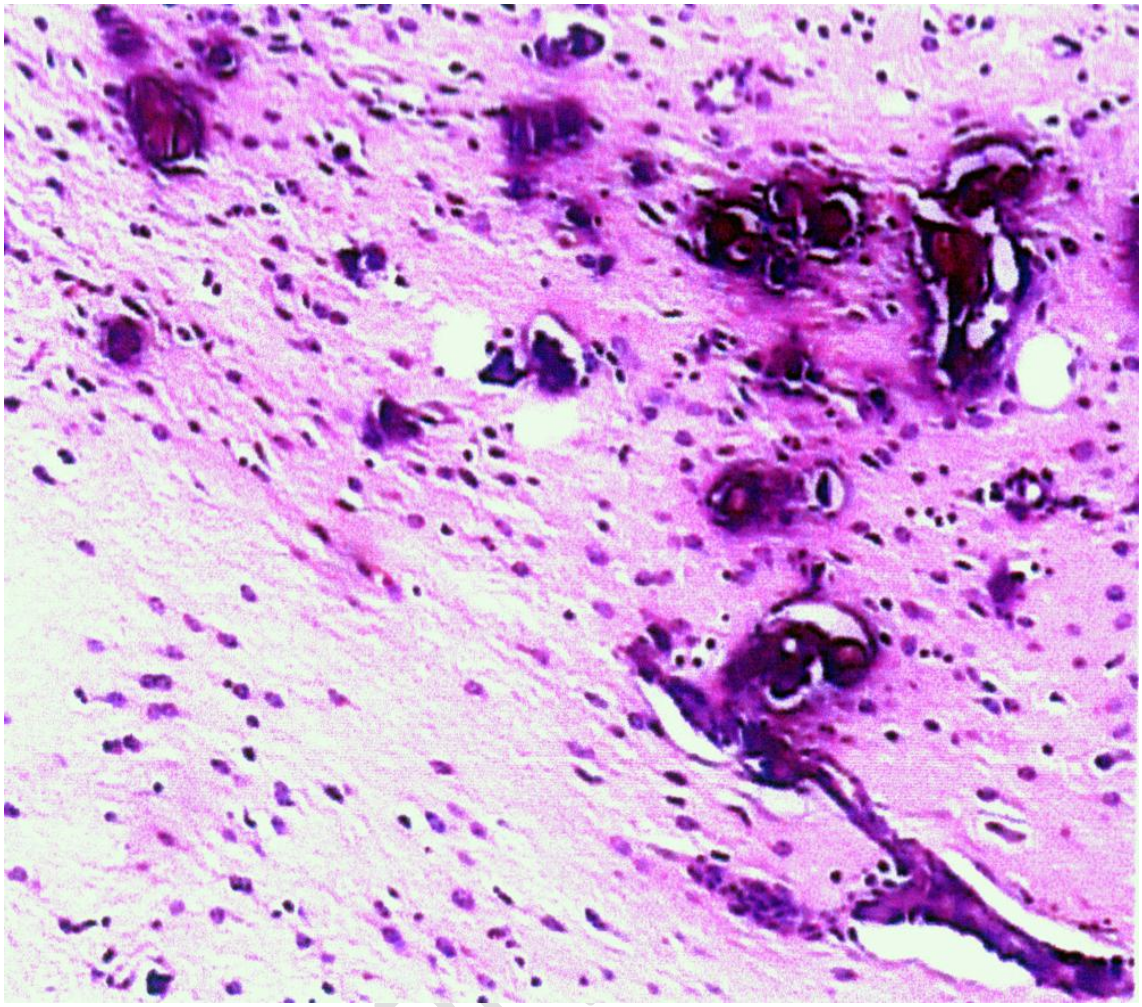

Figure. 2 The high magnification (×400) of the tumor tissue with H&E staining.