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A study of cell proliferation using immunohistological staining: A case report of congenital granular cell epulis

Bo Zhang [a, b, *], Xiaodan Tan [b], Kunlun Zhang [b], Yanchun Li [c], Jingjing Chen [d], Feng Zhang [e]

[a] Department of Oral and Maxillofacial Surgery, Hunan Provincial People's Hospital and The First Affiliated Hospital of Hunan Normal University, Changsha, PR China
[b] Hanwoo DNA Solutions Co., Ltd, Changsha, PR China
[c] Department of Pathology, Hunan Provincial People's Hospital and The First Affiliated Hospital of Hunan Normal University, Changsha, PR China
[d] Department of Epidemiology and Public Health, University of Maryland School of Medicine, University of Maryland, Baltimore, MD, USA
[e] Department of Physical Therapy, Baltimore City Community College, Baltimore, MD, USA

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ABSTRACT

An unusual case of a 1-day-old Chinese female neonate with a solid tumor mass in the maxillary anterior ridge of the edentulous jaw is reported. Based on the clinical and histopathological features, the diagnosis was of obstructive congenital granular cell epulis (CGCE) which is an uncommon benign tumor that preferentially develops in female infants. Immunohistochemical analysis of the lesion was performed and the rate of cell proliferation was determined by immunostaining with Ki-67 and PCNA, which showed labeling indexes of 11.1% and 33.3%, respectively. No recurrence was observed in the follow-up.

1. Introduction

Congenital granular cell epulis (CGCE) is a rare benign tumor of infancy that develops in the gingiva of newborns and is synonymous with congenital epulis, congenital myoblastoma or Neumann's tumor [1,2]. The Greek word “epulis” means “swelling of the gingival” [3]. It occurs usually as a solitary, somewhat pedunculated firm, elastic tumor on the gingival mucosa of the anterior alveolar ridge of the maxilla or mandible [4,5]. However, it has also been described on the tongue [6] or laryngo-tracheal involvement [7–9], even presented in the multiple and largest lesion [10,11] but it must be considered in the differential diagnosis of uncommon lesions, such as hamartomas (oral teratoma) [12]. This article presents an unusual case of a 1-day-old Chinese female neonate with CGCE in the region of the maxillary anterior ridge of the edentulous jaw and the histogenesis and generation of this rare lesion are also discussed. The rate of cell proliferation using an immunostaining procedure was determined by immunostaining with Ki-67 and PCNA.

2. Case report

A 1-day-old female neonate was referred to our department with a huge tumor on the upper jaw for a suckling disorder (Fig. 1A). Delivery was normal at full-term and general examination revealed no other abnormality. Local examination showed an elastic slightly hard pedunculate mobile mass which was present in the maxillary anterior ridge of the edentulous jaw and the surface of the mass was smooth with a mucosal color (Fig. 1B). The clinical diagnosis was congenital epulis, a rare benign tumor that develops in the gingiva of newborns. The mass was excised at the base of the peduncle under local anesthesia, 2 days after birth.

The pathological report described one ovoid solid lesion, 20 mm × 16 mm × 16 mm respectively, with smooth pink surface (Fig. 1C); the cross-sectional surface was a homogenous yellowish-white color and also smooth (Fig. 1D).

Histopathological findings: Hematoxylin and Eosin (H & E) stained section showed closely packed, large, rounded, and

* Corresponding author. Department of Oral and Maxillofacial Surgery, Hunan Provincial People's Hospital and The First Affiliated Hospital of Hunan Normal University, Changsha, Hunan 410005, PR China. Tel.: +86 13787789811.
E-mail address: michaelbozhang@gmail.com (B. Zhang).

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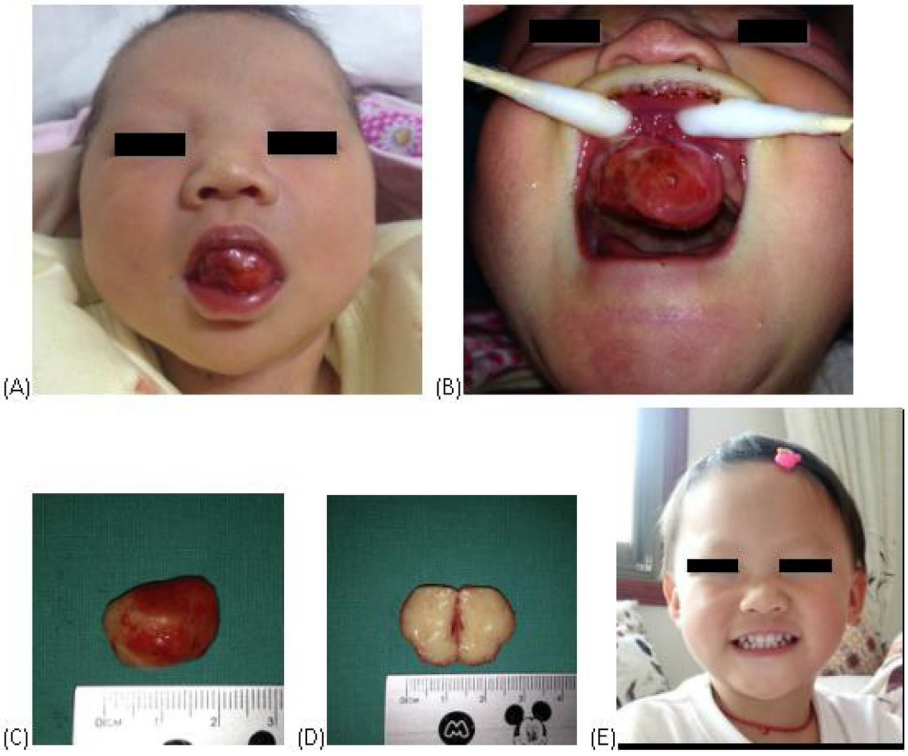

Fig. 1. Clinical and pathological presentation of CGCE. (A) CGCE on the upper jaw preventing normal breast-feeding of a 1-day-old female neonate. (B) and (C) The mass was pedunculated and measured about 2 cm in its greatest diameter. Its surface was smooth with a mucosal color. (D) The cross-sectional surface was yellowish-white and also smooth. (E) The follow-up of 2 years situation showing a normal full frontal view. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

polyhedral cells with slightly eosinophilic granular cytoplasm; the nuclei of the cells were usually small, dark, round-to-oval in shape, and placed centrally or somewhat eccentrically without mitotic figures, some nuclei appeared to be vesicular with a well-defined nucleolus, but there were no malignant findings. The picture was a typical of a CGCE (Fig. 2A and B).

Immunohistochemical findings (Table 1): Histochemically, positive staining was found for PAS, a glycogen marker (Fig. 3A). Samples were positive for NSE, a marker for nerve tissue and neuroendocrine cells (Fig. 3B), negative for S-100, a neuroectoderm-derived cell marker (Fig. 3D) but positive for vimentin, a mesenchymal cell marker (Fig. 3C). The Ki-67 labeling index, which reflects the level of cell proliferation, was 11.1% (Table 1 and Fig. 3E), and the PCNA labeling index was 33.3% (Table 1 and Fig. 3F). Based on these findings, we made a final diagnosis of CGCE. There was no evidence of recurrence in the 2 years follow-up (Fig. 1E).

Table 1
Histochemical and immunohistological staining.

	Result of histochemical staining
PAS	+
Antibody	Result of immunohistological staining
NSE	+
S-100	−
Vimentin	+
Antibody	Labeling index
Ki-67	11.1%
PCNA	33.3%

This study was approved by the Institutional Review Board of Hunan Provincial People's Hospital, and informed consents were obtained from the parents of the infant.

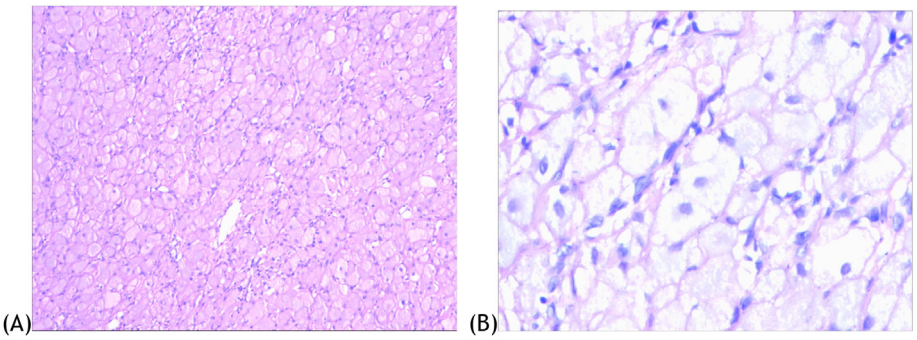

Fig. 2. (A) Closely packed, large, rounded, and polyhedral cells with slightly eosinophilic granular cytoplasm (H&E, OM 100×). (B) The typical nuclei of CGCE (H&E, OM 400×).