



## Benign osteoblastoma of the ethmoid sinus

Hideyuki Kiyohara<sup>a,b,\*</sup>, Motohiro Sawatsubashi<sup>a</sup>, Nozomu Matsumoto<sup>a</sup>, Shizuo Komune<sup>a</sup>

<sup>a</sup> Department of Otorhinolaryngology – Head and Neck Surgery, Graduate School of Medicine, Kyushu University, Fukuoka 812-8582, Japan

<sup>b</sup> Department of Otorhinolaryngology – Head and Neck Surgery, Oda Regional Medical Center, Kashima 849-1392, Japan

### ARTICLE INFO

#### Article history:

Received 26 November 2011

Accepted 11 July 2012

Available online 4 August 2012

#### Keywords:

Osteoblastoma

Ethmoid sinus

### ABSTRACT

Osteoblastoma is categorized as a benign bone-forming tumor, which occurs rarely in the craniofacial region. We report a case of osteoblastoma developed in the nasal cavity and ethmoid sinus in a 14-year-old girl whose chief symptom was nasal obstruction and exophthalmos on the right side. CT revealed the lesion having the same density as bone and a ground-glass border, expanding to the nasal and paranasal cavities. Complete removal was accomplished under endoscopic view, although the tumor was removed piece by piece. Histologic inspection showed exuberant osteoid trabeculae and immature bone formation by osteoblasts with vascularized connective tissue. We diagnosed the tumor as osteoblastoma based on the clinical presentation and the size of the tumor. No recurrence was evident at the 1-year follow-up visit.

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### 1. Introduction

Osteoblastoma is a benign bone-forming tumor. This tumor accounts for less than 1% of all bone tumors and generally occurs in the vertebrae or the long bones of the extremities [1–4], but rarely in the craniofacial region, especially in the nasal and paranasal sinuses. Although the best treatment choice of osteoblastoma is complete resection by means of open surgical excision approaches traditionally, less aggressive resection may be preferred to preserve important organs and to consider cosmetic outcomes. We present a case of osteoblastoma of the nasal cavity and the ethmoid sinus, and should be successfully removed by endoscopic sinus surgery.

### 2. Case report

A 14-year-old girl presented to our clinic with chief complaint being right nasal obstruction and slowly progressive right exophthalmos. Right nasal obstruction had been present since childhood, and right exophthalmos had been present since she was 11 years old. She did not complain of orbital pain, epistaxis, or diplopia.

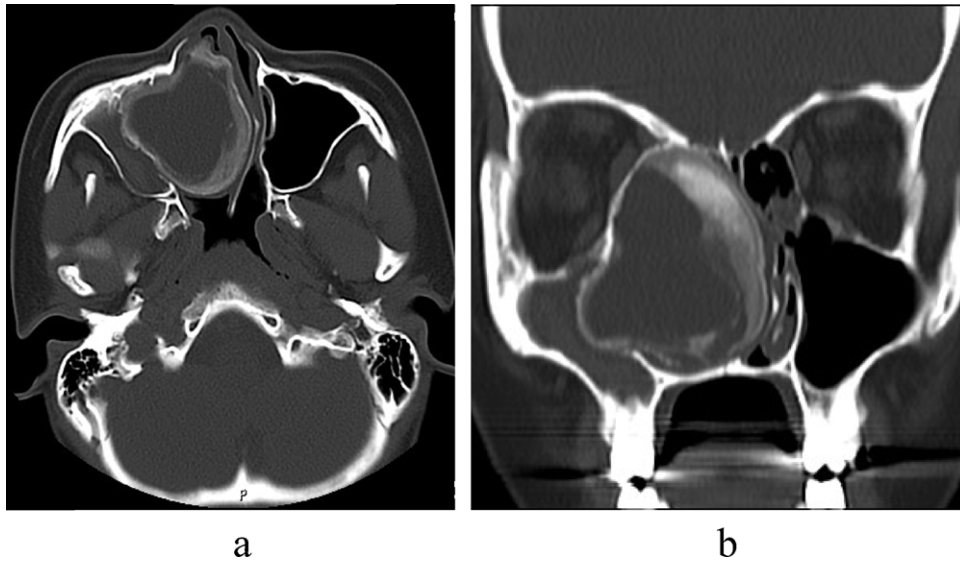
Anterior rhinoscopy showed that the mass was covered with a smooth and normal mucosa, occupying most of the right nasal cavity, deviating the nasal septum to the left. Computed

tomography (CT) scan (Fig. 1) showed an expansive mass having the same density as bone and a ground-glass border in the nasal cavity, extending to the medial wall of the right orbit and the ethmoid sinus. The right middle turbinate could not be seen due to the mass compression. Magnetic resonance imaging (MRI) (Fig. 2) showed the border of the mass of low intensity on both T1- and T2-weighted images and the inside the mass to be an area of low intensity on T1-weighted images and of high intensity on T2-weighted images. A mucocele or benign fibro-osseous lesion was suspected preoperatively.

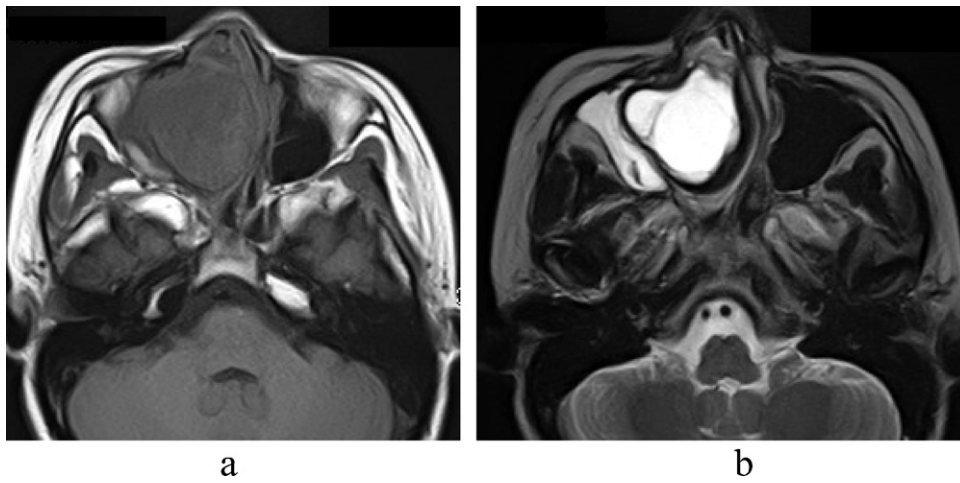
The patient underwent endoscopic resection under general anesthesia, taking into account that the patient wished to have her facial skin intact. The mass was constituted of a thick wall of soft tissue, containing bloody fluid inside. The wall was removed piece by piece endoscopically. The wall of the tumor adhered to the inferomedial wall of the orbit, suggesting the tumor originated from this portion. Otherwise the tumor was removed without difficulty. Thus, we considered that the tumor resection was complete.

Histopathologically, the mass included exuberant osteoid trabeculae and immature bone formation by osteoblasts, as well as vascularized connective tissue (Fig. 3). There was no evidence of malignancy. Histopathological diagnosis was osteoblastoma or osteoid osteoma. We finally diagnosed osteoblastoma based on these histopathologic findings and clinical presentation (no nocturnal pain and tumor size: more than 2 cm). Postoperative radiographic assessment showed that the patient was free of the tumor. There was no sign of recurrence in 1 year after surgery (Fig. 4) except for the soft tissue density at the medial wall of the orbit which has been rhinoscopically observed and showed no change so far.

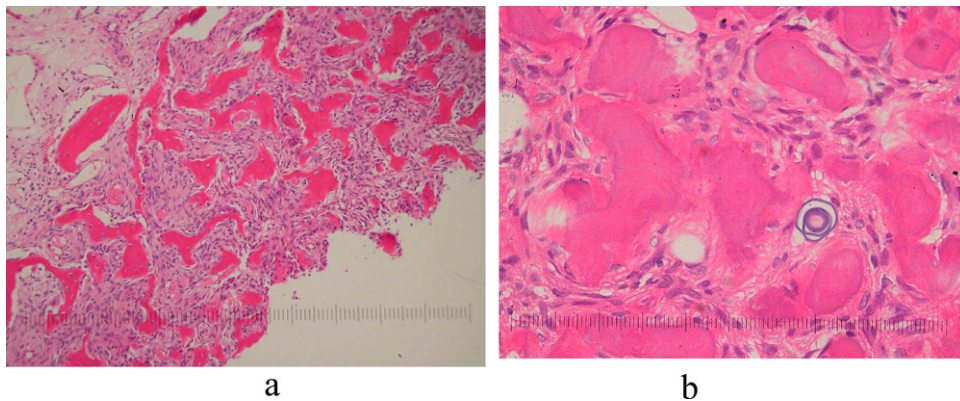
\* Corresponding author at: Department of Otorhinolaryngology – Head and Neck Surgery, Graduate School of Medical Sciences, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, Japan. Tel.: +81 92 642 5668; fax: +81 92 642 5685. E-mail address: [hideyuki@qent.med.kyushu-u.ac.jp](mailto:hideyuki@qent.med.kyushu-u.ac.jp) (H. Kiyohara).



**Fig. 1.** Preoperative computed tomography (CT) scan showing an expansible low-density mass with the same density as bone and a ground-glass border in the nasal cavity, extending to the medial wall of the right orbit and the ethmoid sinus. The right middle turbinate could not be seen. Bone destruction was not evident.



**Fig. 2.** (a) T1-weighted magnetic resonance imaging (MRI) and (b) T2-weighted MRI. Preoperative MRI showed the border of the mass to be an area of low intensity on both T1- and T2-weighted images and the inside portion of the mass to be an area of low intensity on T1-weighted images and of high intensity on T2-weighted images.



**Fig. 3.** (a) Hematoxylin and eosin (H.E.) staining of a tumor section, 40 $\times$ . (b) H.E. staining, 400 $\times$ . Histologic features included exuberant osteoid trabeculae and immature bone formation by osteoblasts, as well as vascularized connective tissue.

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