

# Endoscopic transoral and transmaxillary excision of the infratemporal fossa hemangioma



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## ABSTRACT

Hemangiomas in the infratemporal fossa (ITF) are extremely rare benign vascular tumors. For many tumors of the ITF, with the exception of some small hemangiomas, a lateral facial approach has often been required. Recently, however, there have been some reports that minimally invasive endoscopic surgery can be used in the ITF; this would reduce the risk of surgical complications. To date, there has been no report of a hemangioma of the ITF exceeding 6 cm being resected by the endoscopic approach without facial incisions. Here, however, we report two cases of ITF hemangiomas that were completely extracted endoscopically, using a transmaxillary and transoral approach, without facial incisions or surgical complications.

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## 1. Introduction

Hemangiomas are benign vascular tumors that occur fairly commonly in the head and neck [1], but exceedingly rarely in the infratemporal fossa (ITF) [2,3]. In many cases, surgical extraction of tumors in the ITF requires a lateral facial approach with mobilization of the temporal muscle, parotid gland, and facial nerve, combined with various kinds of mandibular and orbitozygomatic osteotomies [4], as the ITF is a retromaxillary space, bounded by the temporal bone, the medial pterygoid muscle, the mandibular ramus and the posterior wall of the maxillary sinus. Accordingly, the extraction of ITF tumors has typically been associated with surgical complications such as cosmetic deformity, refractory facial pain, and facial nerve injury.

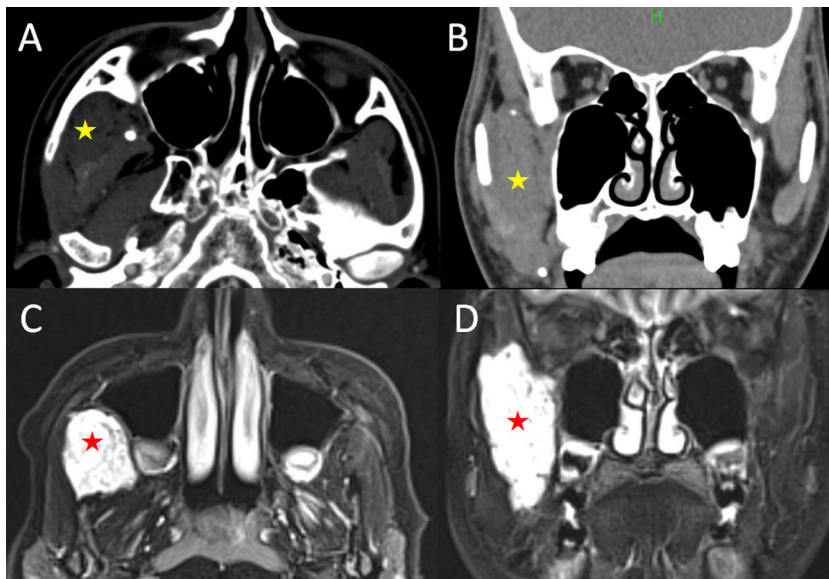
Recently, however, some anatomical studies [5,6] have indicated that an endoscopic approach can be used to resect ITF tumors. Yet no previous report has shown that a hemangioma of the ITF exceeding 6 cm can be resected by the endoscopic approach [7] without facial incisions. Here, we report two cases in which ITF hemangiomas were completely extracted endoscopically, using a transmaxillary and transoral [7] approach, without facial incisions or surgical complications [8].

## 2. Case report 1

A 16-year-old male presented to our clinic with a swelling and severe pain on the front part of the ear, starting 3 months prior to his visit. CT scan revealed a calcification in the ITF which was considered to be a phlebolith (Fig. 1A and B), along with a mass with a well-defined border and a density equal to that of the surrounding muscle. In the same area, a high-intensity mass was found on a T2-weighted MR image (Fig. 1C and D), which led to a diagnosis of hemangioma. The major axis of the tumor was 8 cm. CT-angiography (Fig. 2) indicated that the feeding artery of the tumor was the right maxillary artery.

The interventionalist performed embolization of the right maxillary artery by interventional radiology 1 day before the surgery. Surgical resection of the tumor was performed by an endoscopic approach through the nose and mouth under direct visualization with a 4.0-mm 0-degree and 70-degree telescope fixed with an endoscopic holder, as we have reported elsewhere [7]. First, maxillary fontanelle was opened by endonasal antrostomy. The anterior wall of the maxillary sinus was fenestrated for a hinge flap by a high-speed drill with Caldwell–Luc incisions (Fig. 3A). Only parts of the posterior and lateral walls of the maxillary sinus were removed from the external pterygoid muscle, and the right maxillary artery was coagulated. The tumor was peeled away from the surrounding tissues (such as muscles and fatty tissues) with the aid of cauterization under endoscopic visualization (Fig. 3B) and its inner, lower and posterior parts were detached from the peripheral tissue by the endoscopic

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**Fig. 1.** CT and MRI images in Case 1 (★: tumor). (A) CT axial view: mass with well-defined border and density equal to that of muscles with some phleboliths. (B) CT coronal view: mass with well-defined border and density equal to that of muscles with some phleboliths. (C) MRI (T2) axial view: high intensity mass visible in the ITF. (D) MRI coronal view: high intensity mass visible in the ITF.

transmaxillary approach. From the region of the dental root incision outwards, the anterior and lateral parts were exteriorized and the lateral and superior parts of the tumor were detached from the masseter muscle with bipolar scissors (Fig. 3C). The upper part of the tumor, which was the most difficult to view during surgery, was detached using a 70-degree endoscope fixed with an endoscopic holder (Fig. 3D). Finally, the tumor was extracted en bloc after we had removed the superior part of the tumor using a suctionable monopolar radio knife. Its actual measurements were 6 cm × 4 cm × 3.5 cm. The fenestrated anterior wall of the maxillary sinus was sewn back into its original position after the maxillary sinus was filled with SORBASAN<sup>®</sup>. SORBASAN<sup>®</sup> was suctioned from the maxillary sinus via maxillary fontanelle endonasally 14 days after operation.

After the operation, the patient was observed to have some temporary swelling of the cheek and difficulty opening the mouth,

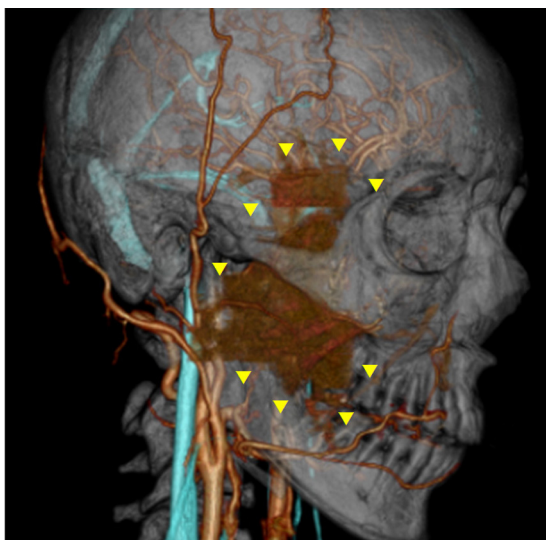
but these resolved without treatment. There was no sign of facial nerve paralysis or numbness in the upper jaw. A pathological study identified the tumor as cavernous hemangioma. MRI (Fig. 4) shows no evidence of recurrence 2 years after surgery.

### 3. Case report 2

A 52-year-old woman became aware of a swelling in her left cheek 6 months prior to visiting our hospital. A CT image showed a tumor mass with a tumor stain of the maxillary artery (Fig. 5A and B), but no phlebolith was found. T2-weighted MRI (Fig. 5C and D) revealed a high-intensity area with contrast unequal to that in a T1-weighted image using gadolinium contrast agent; this led to the diagnosis of a hemangioma. The major axis of the tumor was 7 cm.

In this case, embolization was not enforced. First, maxillary fontanelle was opened by endonasal antrostomy. The anterior wall of the maxillary sinus was fenestrated as in Case 1, but only parts of the posterior and lateral maxillary walls were removed and the inner part of tumor was visualized using a 0-degree and 70-degree telescope fixed with an endoscopic holder (Fig. 6A). The light maxillary artery feeding to the tumor was identified and clipped (Fig. 6B). Additional thin blood vessels running into the tumor were cut by ablation using a suctionable radio knife. From the region of the dental root incision outwards, the anterior and lateral parts of the tumor were exteriorized (Fig. 6C). Finally, the tumor was extracted en bloc after the lateral and superior parts of the tumor were detached with a bipolar radio knife as well as a suctionable monopolar radio knife (Fig. 6D). Its actual measurements were 6 cm × 3 cm × 3 cm. The fenestrated anterior wall of the maxillary sinus was sewn back into its original position after the maxillary sinus was filled with SORBASAN<sup>®</sup>. SORBASAN<sup>®</sup> was suctioned from the maxillary sinus via maxillary fontanelle endonasally 14 days after operation.

After the surgery, temporary swelling on the cheeks and trismus was observed, but these resolved without treatment. There was no sign of facial nerve paralysis or numbness in the upper jaw. A pathological study identified the tumor as cavernous hemangioma. MRI (Fig. 7) shows no evidence of recurrence 2 years after surgery.



**Fig. 2.** 3D-CT angiography. Tumor (surrounding ▼) was fed by right maxillary artery. Tumor visible in the ITF above the zygomatic arch.

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