

## Solitary Fibrous Tumor Arising from the Superior Nasal Turbinate: A Case Report

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### Abstract

Solitary fibrous tumor is a rare neoplasm, which was first described as a primary spindle-cell tumor of the pleura, is a type of mesenchymal tumor. Although the majority of these tumors originate in the pleura, they can also derive from extrapleural sites, such as the liver, lung, abdomen, and extremities. We report a rare case of a nasal solitary fibrous tumor that originated from the nasal superior turbinate. The tumor, measuring 45 × 25 × 10 mm, was in the right nasal cavity. We successfully removed the tumor in one piece through endonasal endoscopic surgery. The tumor had spindle-shaped cells within a collagenous stroma and was positive for CD34. There has been no evidence of tumor recurrence in the 14 months following surgery.

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**Key words:** solitary fibrous tumor, nasal cavity, endoscopic surgery, CD34

### Introduction

Solitary fibrous tumor (SFT) is an uncommon neoplasm that usually arises from the pleura<sup>1</sup>. To the best of our knowledge, there have been only 30 reports of nasal SFT in the English-language literature<sup>2</sup>. Recently, the number of reported cases of nasal SFTs has been increasing<sup>2-4</sup>. We present an additional case of nasal SFT and discuss its diagnosis, histological characteristics, and treatment.

### Case Report

A 37-year-old Japanese woman presented with a 6-month history of headache, rhinorrhea, and right-

sided nasal obstruction. There was no history of nasal bleeding. Anterior rhinoscopy revealed a large elastic tumor with a smooth, grayish, and glistening surface which had originated from the olfactory fissure of the right nasal cavity (**Fig. 1**). Coronal and horizontal computed tomography (CT) scans showed a homogeneous mass occupying the space from the anterior ethmoid sinus to the sphenoid sinus with osteoblastic components and calcification at the level of the superior turbinate. The right maxillary sinus was occupied by secretions (**Fig. 2, 3**). An excisional biopsy of the frontal surface of the tumor was performed. Light microscopic examination of the specimen showed fibrosis, edema, and inflammatory-cell infiltration of the nasal mucosa. The provisional pathological diagnosis was mucosa with chronic

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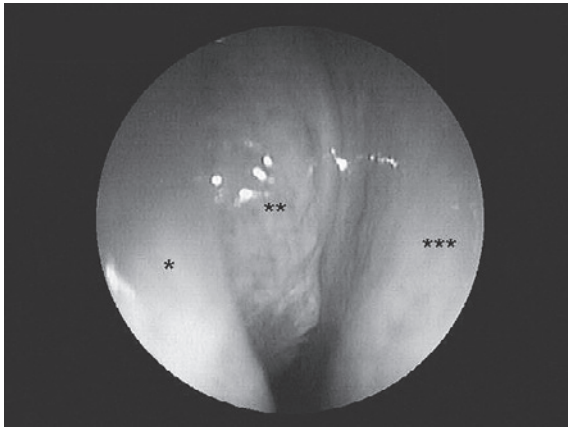


Fig. 1 The findings of endoscopic examination. We found a large tumor with a grayish and glistening surface in the right nasal cavity.  
\*: Inferior turbinate, \*\*: Tumor, \*\*\*\*: Nasal septum



Fig. 3 Horizontal CT scan shows a homogeneous mass with calcification occupying the space from the anterior ethmoid sinus to the sphenoid sinus.  
\*: Homogenous mass with calcification at the level of ethmoid sinus  
\*\*: Homogenous mass at the level of sphenoid sinus



Fig. 2 Coronal CT scan shows a homogeneous mass occupying the right nasal cavity with osteoblastic components at the level of the superior turbinate. The maxillary sinus was occupied by secretion.  
\*: Tumor, \*\*: Osteoblastic components at the level of superior turbinate, \*\*\*: Inferior turbinate, \*\*\*\*: Maxillary sinus with secretion

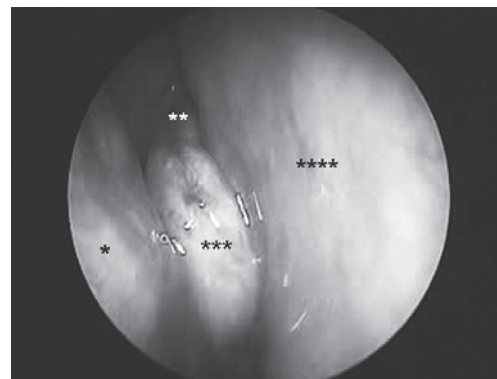


Fig. 4 Further endoscopic examination suggested that the tumor had originated from the superior turbinate near the sphenoethmoidal recess.  
\*: Middle turbinate, \*\*: Superior turbinate, \*\*\*: Tumor, \*\*\*\*: Nasal septum

sinusitis.

On the basis of these results, we performed endonasal endoscopic surgery with the patient under general anesthesia. Through the enlarged endoscopic view, we could clearly identify the portions of the nasal cavity the tumor had invaded. The tumor occupied mainly the olfactory fissure in the right nasal cavity. Further endoscopic examination suggested that the tumor had originated from the superior turbinate near the sphenoethmoidal recess but had not invaded the

sphenoid sinus (**Fig. 4**). The sphenoid sinus was occupied by mucous effusion. We also resected the superior turbinate because it showed severe fibrotic and osteoblastic changes and was thought to be a root of this tumor. The tumor could be removed in a single piece with minimal bleeding. The tumor measured 45 × 25 × 10 mm and was not encapsulated. On light microscopic examination of the surgical specimen, a patternless arrangement of spindle-shaped cells within areas of different cellularity was noted. Ovoid and spindle-shaped cells

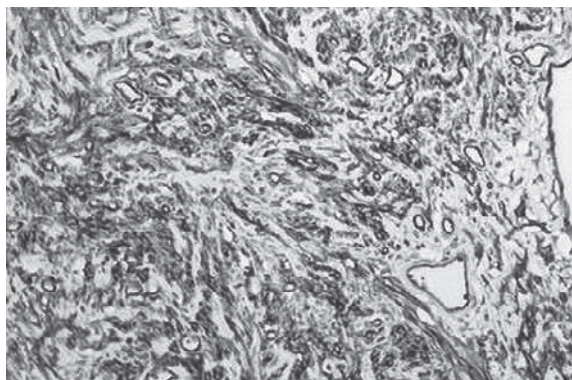


Fig. 5 Tumor section showed positive staining for CD34 (original  $\times 200$ ).

were irregularly distributed in a dense collagenous stroma with numerous vessels. The tumor nuclei showed no atypical mitoses. Immunohistochemical staining showed the tumor cells were positive for CD34 (**Fig. 5**) and vimentin but negative for S100 protein and smooth muscle actin. On the basis of these pathologic findings, the final diagnosis of SFT was made.

### Discussion

The main symptoms of nasal SFT are progressive unilateral nasal obstruction, rhinorrhea, headache, and epistaxis<sup>2</sup>. In present case, headache and nasal obstruction had been noted by the patient for 6 months, but there were no bleeding or other specific symptoms. The typical rhinoscopic or endoscopic findings of nasal SFT are of 2 types. One type is a grayish or pinkish, solid, and glistening tumor with a smooth surface<sup>2,4,5</sup>, and the other type is a rough, reddish mass that bleeds easily<sup>3,6,7</sup>. In our case, the tumor was grayish, solid mass with no bleeding. The appearance of a SFT on imaging studies is generally nonspecific<sup>8</sup>. Therefore, preoperative pathologic and endoscopic examinations are decisive for therapeutic planning. However, in our case, CT showed a calcific component at the portion of the superior turbinate, which was a root of the tumor. Two other cases with reactive remodeling of native bone have been reported<sup>8,9</sup>. Calcification is rarely present in SFTs<sup>8,10</sup>.

SFTs are rare neoplasms usually occurring in adults at the level of the pleura but can also derive from other extraserosal sites<sup>11</sup>. The disease occurs

equally in men and women aged 30 to 70 years. Pleural SFTs usually show benign behavior and can be cured with surgical excision. In contrast, 12% to 20% of pleural SFTs are associated with invasion, recurrence, and metastasis<sup>9,10</sup>. Recently, SFTs have been reported often in the head and neck area, including the nasal cavity and paranasal sinuses. Five percent to 10% of extrapleural SFTs are recurrent<sup>5</sup>. Several cases of recurrent nasal SFT due to incomplete primary resection have also been reported<sup>4,5</sup>. From a clinical point of view, the differential diagnoses for a nasal SFT are numerous. In the sinonasal setting, this type of rare neoplasm is difficult to distinguish from other tumors, such as epithelial neoplasms, lymphoma, angiofibroma, schwannoma, fibromatosis, and fibrosarcoma<sup>8</sup>. The definitive diagnosis of SFT is based on histopathological examination. The gross pathologic findings of SFTs are often polypoid masses with a smooth external surface and a grayish appearance on cut section. The microscopic findings of SFTs are typically proliferation of ovoid or spindle-shaped cells randomly distributed along a patternless-pattern within a collagenous stroma of variable vascularity<sup>8,9</sup>. The histopathologic features of SFTs are often confused with those of schwannoma, fibrous histiocytoma, low-grade fibrosarcoma, and nasopharyngeal angiofibroma. As a result, diagnoses based on excisional biopsies of SFT are often incorrect. Pathological diagnoses of preoperative biopsy specimens in cases of SFT have included angiofibroma, schwannoma, hemangiopericytoma, and granulation<sup>5,9,12,13</sup>. In our case, the provisional pathological diagnosis was mucosa with chronic sinusitis, because the biopsy specimen was too small and superficial. Establishing a preoperative pathological diagnosis of SFT can be difficult. Staining for CD34 (are marker of endothelial cells and myeloid progenitor cells) and vimentin (marker of mature mesenchymal cells) is reported to be helpful for ruling out other mesenchymal neoplasms<sup>14</sup>. On the other hand, staining for S-100 protein, keratin, and desmin is reported to be negative. In our patient, staining was strongly positive for CD34 but was negative for S-100 protein and smooth muscle actin. Immunohistochemical

staining for CD34 has been considered a specific marker for SFTs, because it is positive in 79% of SFTs<sup>14</sup>. Such staining is also useful for distinguishing fibrosarcomas from SFTs.

In all reported cases of SFT, surgical treatment was performed. Procedures performed have included medial maxillectomy, lateral rhinotomy, ethmoidectomy, sphenoidectomy, and surgery via the transfacial approach<sup>3,4,7</sup>. Since 2003, 9 reported cases (including the present case) have been treated with endoscopic sinus surgery<sup>2-4</sup>. Four SFTs, including malignant SFTs that invaded the anterior cranial fossa or infratemporal fossa, were removed via the transcranial or transfacial approach<sup>8,15-17</sup>.

The tumor of the present patient occupied the olfactory fissure in the right nasal cavity. CT showed a tumor with calcification. On preoperative endoscopic examination a surgical space was observed between the tumor and the nasal septum or the middle nasal turbinate. Preoperative biopsy suggested the tumor was a benign neoplasm or an inflammatory polyp that could be removed with endoscopic surgery. We were able to remove the relatively large tumor in a single piece by means of endonasal endoscopic surgery, which caused minimal bleeding or scarring. The patient has been followed up for 15 months after surgery without macroscopic evidence of tumor recurrence. Recently, the number of reported cases of nasal SFTs has been increasing. Our experience suggests that a tumor containing osteoblastic components and having a smooth, grayish, and glistening surface might be an SFT. We should include SFT as a neoplasm that should be distinguished from inflammatory nasal polyps.

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