

Schwannoma Originating from the Superior Turbinate

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— ABSTRACT —

Schwannoma in the nasal cavity is rare. Only 4% of head and neck schwannomas occur in the sinonasal cavity. Sinonasal schwannomas are postulated to arise from the ophthalmic and maxillary branches of the trigeminal nerve, or from autonomic nerves to the septal vessels and mucosa. Various origins of nasal schwannomas have been reported in the literature, including the inferior turbinate, middle turbinate, nasal septum, and nasal vestibule. We report the findings for a 40-year-old man who presented with nasal obstruction due to a schwannoma originating in the superior turbinate. (J Clinical Otolaryngol 2016;27:357-361)

KEY WORDS : Schwannoma · Nasal cavity · Nasal neoplasm · Nose.

Introduction

Schwannomas are benign slow-growing tumors that can arise from the nerve sheath of any myelinated nerve. Although schwannomas are common in the head and neck, only 4% of head and neck schwannomas occur in the sinonasal tract.¹⁾ Various origins of nasal schwannomas have been reported in the literature, including the inferior turbinate,^{2,3)} middle turbinate,^{4,5)} nasal septum,^{6,7)} and nasal vestibule.^{8,9)} Schwannoma originating in the superior turbinate is extremely rare.

Case Report

A 40-year-old man presented to the clinic with a 5-month history of left-sided nasal obstruction. He de-

nied any history of underlying systemic disease, trauma, or nasal surgery. Nasal endoscopy showed a large mass obstructing the entire anterior and posterior nasal cavity. The mass appeared well-demarcated, smooth-margined, soft, and yellowish in color (Fig. 1).

A computed tomography (CT) scan of the sinus showed soft-tissue densities occupying the frontal sinus, anterior ethmoid sinus, maxillary sinus, sphenoidal recess, and posterior choanae on the left side (Fig. 2A, B). CT revealed the presence of an expansile mass without invasion or destruction of surrounding bony structures. Magnetic resonance imaging (MRI) showed that the mass was isointense on coronal T1-weighted images, with a hyperintense but heterogenous pattern on coronal T2-weighted images (Fig. 3A, B). Contrast enhanced fat-suppressed coronal T1-weighted images revealed the cystic portion of the mass and well-enhancement in the remaining portion (Fig. 3C). Preoperative biopsy was not performed because of showing the benign nature on the radiologic findings.

Endoscopic excision of the mass was performed under general anesthesia. When the mass was opened, its tissue appeared fragile and yellowish in color, and there was no discernible capsule. Since the mass was

논문접수일 : 2016년 8월 22일
논문수정일 : 2016년 9월 30일
심사완료일 : 2016년 10월 21일
교신저자 : 이재훈, 54538 전북 익산시 무왕로 895
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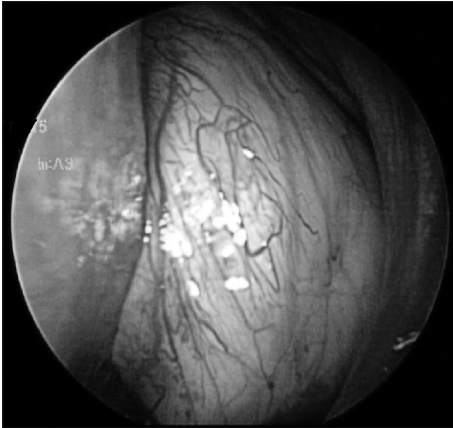


Fig. 1. Endoscopy shows a large mass obstructing the entire anterior and posterior portions of the left nasal cavity. The mass appears well-demarcated, smooth-margined, soft, and yellowish in color.

so fragile, it was removed in pieces instead of en bloc. Freer elevator and a 0° endoscope was used in an attempt to trace the mass toward its origin. The mass occupied the sphenothmoidal recess and pushed the middle turbinate in a lateral direction. After removal of the mass in the sphenothmoidal recess, it was found to originate from the superior turbinate (Fig. 4A, B). A microdebrider was used to remove the portion of the superior turbinate to which the mass was attached. The bleeding was minimal during the mass resection.

The removed mass was sent for optimal histopathological analysis, which was consistent with those of a schwannoma: it comprised hypercellular Antoni type A and hypocellular Antoni type B areas (Fig.

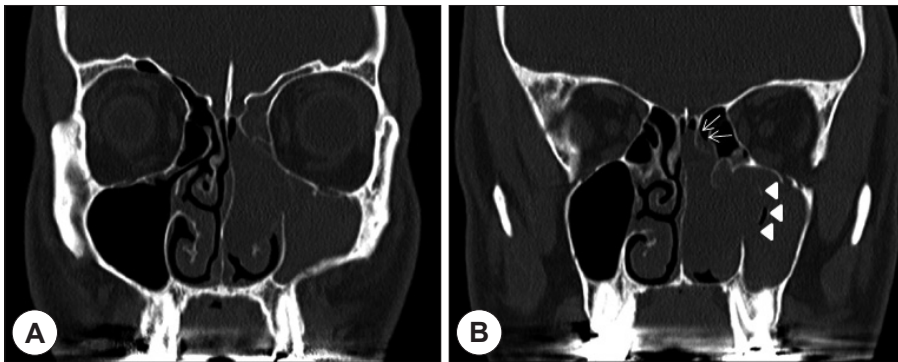


Fig. 2. A : Coronal CT scan shows soft-tissue densities occupying the left frontal, anterior ethmoid, and maxillary sinus. B : Coronal CT scan shows soft-tissue densities extending the sphenothmoidal recess and posterior choanae on the left side. The CT shows the appearance of an expansile mass (arrowheads) without invasion or destruction of surrounding bony structures. Two arrows indicate the superior turbinate ; the origin site of the mass.

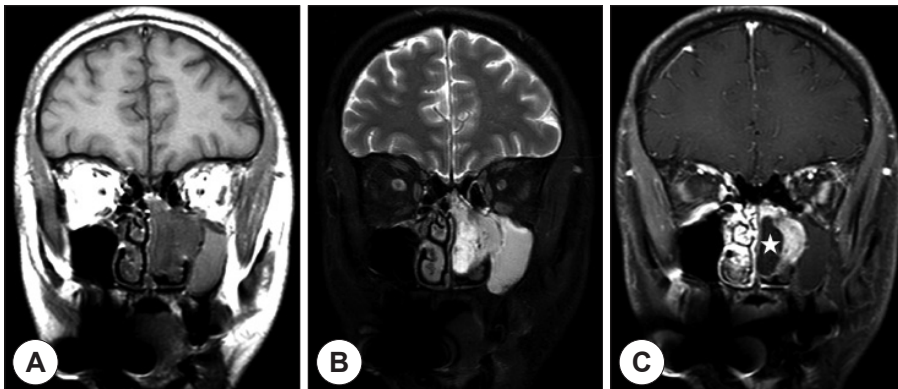


Fig. 3. A : Coronal T1-weighted image shows that the mass is isointense. B : Coronal T2-weighted image shows that the mass has a hyperintense but heterogenous pattern. C : Contrast enhanced fat-suppressed coronal T1-weighted image shows the cystic portion (asterisk) of the mass and well-enhancement in the remaining portion.

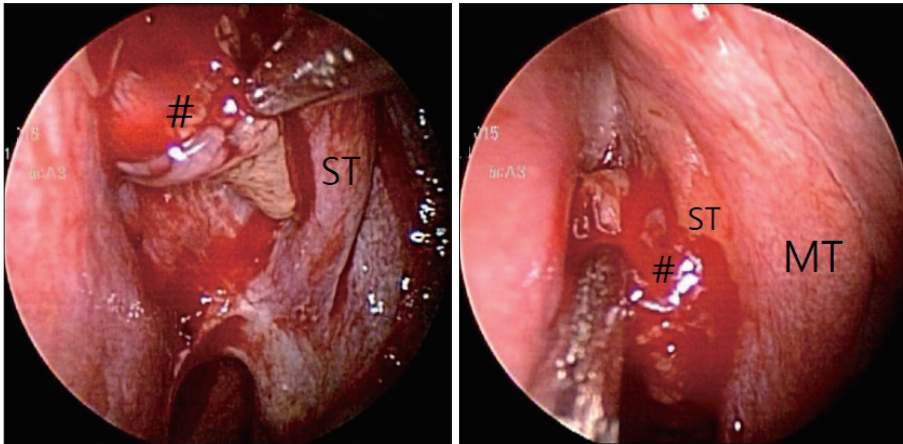


Fig. 4. A : The mass occupies the sphenoidal recess. B : After removal of the mass in the sphenoidal recess, it is found to originate from the superior turbinate. # : mass, MT : middle turbinate, ST : superior turbinate.

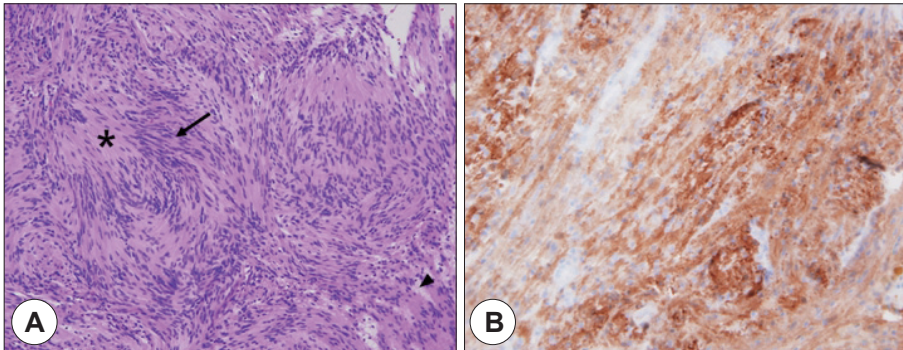


Fig. 5. A : The tumor is composed of uniformly spindled Schwann cells with Antoni A (cellular fascicular, arrow), Antoni B (myxoid : vacuolated, arrowhead) and anuclear zone (Verocay body, asterisk) (H-E stain, $\times 200$). B : These tumor cells are immunoreactive for S-100 protein (S-100 protein, $\times 400$).

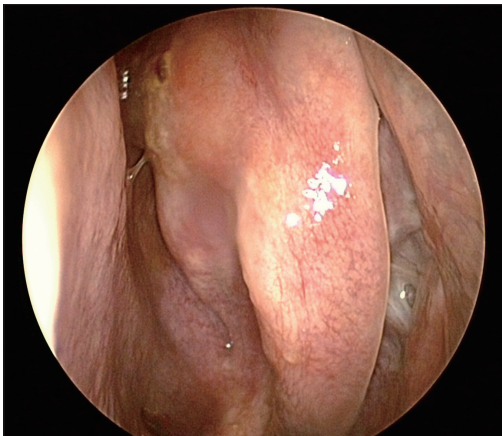


Fig. 6. There is no evidence of recurrence at the 3-month follow-up.

5A). The tumor cells tested positive for S-100 protein on immunostaining (Fig. 5B), confirming the diagnosis of schwannoma. The patient's condition was good post-operatively, with resolution of the nasal obstruction (Fig. 6). There was no evidence of recurrence at the 15-month follow-up.

Discussion

Schwannomas are rare in the nasal cavity. Sinonasal schwannomas (SNSs) are postulated to arise from the ophthalmic and maxillary branches of the trigeminal nerve, or from autonomic nerves to the septal vessels and mucosa.¹⁰⁾ All turbinate structures of the later-

al nasal wall are innervated by the maxillary branches of the trigeminal nerve.¹¹⁾ However, identification of the originating nerve may be difficult.

Most of SNSs in previous case series reports originated from the ethmoid (10 cases), followed by the nasal cavity (5 cases), middle turbinate (4 cases), nasal septum (3 cases), maxillary (3 cases), pterygopalatine forssa (2 cases), and nasal vestibule (2 cases)

Table 1. Previous schwannoma case series reports of the sinonasal tract

Authors (year)	Cases (n)	Tumor origin (n)
Hasegawa et al ¹²⁾ (1997)	6	Nasal cavity (4) Maxillary sinus (1) Nasopharynx (1)
Buob et al ¹³⁾ (2003)	5	Ethmoid sinus (3) Maxillary sinus (1) Nasal cavity (1)
Sheikh et al ¹⁴⁾ (2008)	5	Ethmoid sinus (4) Maxillary sinus (1)
Hong et al ¹⁵⁾ (2013)	8	Nasal septum (2) Nasal vestibule (2) Pterygopalatine fossa (2) Ethmoid sinus (1) Inferior turbinate (1)
Forer et al ⁵⁾ (2015)	10	Middle turbinate (4) Ethmoid sinus (2) Sphenoid sinus (1) Anterior sphenoid wall (1) Nasal septum (1) Infratemporal fossa (1)
Total	34	Ethmoid sinus (10) Nasal cavity (5) Middle turbinate (4) Nasal septum(3) Maxillary sinus (3) Pterygopalatine fossa (2) Nasal vestibule (2) Sphenoid sinus (1) Inferior turbinate (1) Infratemporal fossa (1) Nasopharynx (1) Anterior sphenoid wall (1)

(Table 1).^{5,12-15)} The exact origin site of the nasal cavity was not described in two previous case series reports.^{12,13)} The most common origin site was ethmoid, but this result is pretty different between previous case series reports. This result might be drawn the data from small case series (5–10 cases). The cases originated from the nasal turbinate were middle turbinate (4 cases) and inferior turbinate (1 case), but the case originating from the superior turbinate has not been reported.

SNSs usually have a benign course. They are slow-growing and can reach a considerable size without obvious symptoms. The common signs and symptoms of SNSs are similar to those of other benign tumors in the sinonasal tract, and include nasal obstruction, epistaxis, and secondary sinus infection due to compromised drainage.⁵⁾ In the present case, the presenting symptom of this case was only nasal obstruction due to the large-sized tumor.

Since SNSs commonly have a polypoid appearance and lack distinctive features, they are usually mistaken for nasal polyps, that are later histologically proven to be schwannomas.⁹⁾ The differential diagnosis should include melanomas and olfactory neuroblastomas.⁷⁾

Radiological examinations such as CT and MRI are very helpful for localizing and defining the extent of SNSs. On MRI scans, schwannomas frequently appear as an isointense lesion on T1-weighted images, and as an intermediate to hyperintense lesion on T2-weighted images.¹⁶⁾ Cystic or hemorrhagic degeneration is a characteristic feature of schwannomas, particularly in large tumors, and MRI better demonstrates the signal intensities of cystic or hemorrhagic degeneration than CT due to higher soft-tissue contrast resolution.¹⁷⁾ In the present case, contrast enhanced fat-suppressed coronal T1-weighted image showed the cystic degeneration within the large tumor.

Histologically, schwannomas can exhibit both Antoni type A (palisading cells surrounding an acellular central area) and Antoni type B (less cellular non-palisading cells without any distinct arrangement) pat-

terns in the same specimen.¹³⁾ Immunohistochemical staining is important to the pathologist in the identification of these lesions. Schwannomas usually show positive immunoreactivity for S-100 protein (particularly in Antoni A areas), that may help to distinguish peripheral nerve sheath neoplasms from other tumors.¹⁸⁾

The treatment of choice for SNSs is complete surgical excision.^{19,20)} A resection approach that allows adequate exposure, depending on the location and extent of the tumor, must be chosen. This can involve various combinations of techniques, including endonasal endoscopic resection and external approaches such as lateral rhinotomy, external ethmoidectomy, Caldwell-Luc approach, and midfacial degloving.⁷⁾ Functional and cosmetic aspects have to be considered when selecting the surgical approach due to the noninvasive and slow-growing nature of this tumor. SNSs prognosis is excellent because the tumor is benign and the postoperative recurrence is rare.⁹⁾ In the present case, endonasal endoscopic resection of SNS was performed, there was no evidence of recurrence at the 15-month follow-up. Although the postoperative recurrence is rare, long-term follow-up should be needed. The authors present a case of schwannoma originating from the superior turbinate with literature review.

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