

Sphenoid Sinusitis as a Possible Cause of Trismus

Sir,

The sphenoid sinus is the most deeply located paranasal sinus. A wide range of signs and symptoms may be attributed not only by several neighboring structures but also anatomic variations among individuals.^[1-3] Neuroimaging, such as computed tomography (CT) and magnetic resonance imaging (MRI), are extremely useful in the diagnosis of sphenoid sinus lesions and help clinicians to explain the clinical symptoms by demonstrating evidence of the structural relationship.^[4,5] So far, the reports of trigeminal nerve dysfunction caused by the sphenoid sinus lesions

were extremely rare. Hereby, we report a 58-year-old female patient presented with paroxysmal trismus caused by sphenoid sinusitis and we also demonstrated neuroimaging to reveal the causal relationship. The patient has provided informed consent for publication of the case.

A 58-year-old female patient presented a week history of paroxysmal spasm on the left face. The patient was previously healthy and had no history of sinusitis, trauma, or temporomandibular joint disorders. Recently, the patient complained of upper respiratory tract symptoms for 2 weeks. The episodes were precipitated by chewing

and occasionally accompanied by severe pain. The spasms were severe during the episodes, which made her feel the teeth might break. The patient has never been treated before and the symptoms gradually got worse over time. At visiting, vital signs were normal. Physical examination showed symmetric masseter muscle volume. Facial muscle power including masseter muscle and facial sensation were normal. Whenever the episode occurs, she was not able to open her mouth due to the severe painful spasm of the left masseter muscle. The spasm gradually increased in intensity with time and was soon followed by severe pain. Several seconds to minutes after symptom occurs, the spasm would stop spontaneously [Video 1]. Based on the typical clinical findings, the patient was diagnosed with left masticatory muscles spasm. Routine laboratory findings, including complete blood count, liver function test, random blood sugar, renal function test, electrolyte, and C-reactive protein, were normal. CT and MRI were performed to investigate the structural lesion and demonstrated sphenoid sinusitis of affected side with findings of mucoperiosteal thickening and perineural enhancement of mandibular nerve, which can explain the etiology of the neurological symptom [Figure 1]. Carbamazepine (daily 200 mg, increased to 400 mg) was used to reduce the hemimasticatory muscles spasm. Simultaneously, otorhinolaryngologist treated the patient with symptomatic therapy for the sphenoid sinusitis. She showed clinical improvement without any side effects. After 4 weeks, the patient decided to refuse further invasive treatment because the symptom was much improved.

In the past, the sphenoid sinus has not been well known, which has been considered as neglected sinus because of its isolated position and difficult accessibility.^[6] However, a disease associated with sphenoid sinus lesion has been increasingly reported in recent literature. Numerous neurological symptoms can occur when the neurovascular structures surrounding the sphenoid sinus are involved, namely; cranial nerves II, III, IV, V, VI, vidian canal, internal carotid artery, cavernous sinus, sphenopalatine ganglion, sphenopalatine artery, and pituitary gland.^[1] Although several cases with ocular cranial nerve dysfunction caused by sphenoid sinus lesion have been reported recently,^[2,3] the reports of trigeminal nerve dysfunction were extremely rare.^[7,8] As far as we know, this is the first case report to demonstrate the lesion in the mandibular nerve of the trigeminal nerve caused by the sphenoid sinusitis. Trismus owing to sphenoid sinusitis was previously reported.^[7] A healthy 65-year-old man presented trismus with a headache for 10 days. He was finally diagnosed with sphenoid sinusitis by CT scan. In this report, the direct spread of inflammation to the masticatory muscles or the mandibular nerve innervating masticatory muscles were proposed to explain the cause of masticatory muscle spasm. CT scan only showed the opacification of sphenoid sinus and medial pterygoid muscle hypertrophy. Although CT and MRI are mandatory in the investigation of sphenoid sinus lesion,^[9] the evaluation for soft tissue has not been tried by MRI in the previous study, which is a potential

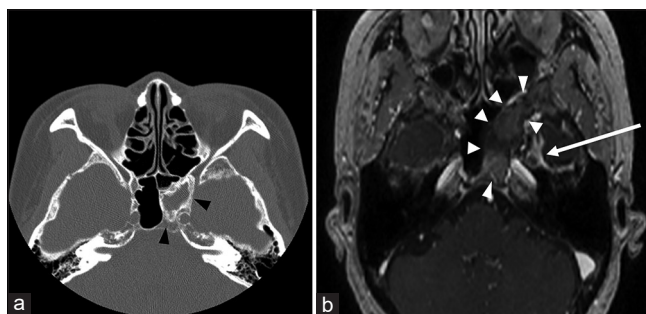


Figure 1: Sphenoid sinusitis. Prominent mucoperiosteal thickening is noted (black arrowheads) on computerized tomography (a). Left mandibular nerve with perineural enhancement is surrounded by engorged veins (white arrows) and isolated sphenoid sinusitis is indicated on contrast enhanced 3-dimensional fast spoiled gradient-echo T1 weighted image of magnetic resonance imaging (white arrowheads, b)

limitation.^[7] In our case, the cause of left masticatory muscles spasms was able to be explained by ipsilateral mandibular nerve with perineural enhancement on MRI. Interestingly, the sphenoid sinus on the affected side has anatomic variation characterized by large size and shape sequestering to the pterygoid plate. Due to the distinct structure, the sphenoid sinus on the affected side in our case was located so close to the mandibular nerve pathway [Figure 1]. Therefore, we suggest that the sphenoid sinusitis can be a possible cause of trismus.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Jong-Mok Lee, Myong H. Hahm¹, Ho-Sung Ryu, Yang-Ha Hwang

Departments of Neurology and ¹Radiology, Kyungpook National University Hospital, Daegu, South Korea

Address for correspondence: Dr. Ho-Sung Ryu, Department of Neurology, Kyungpook National University Hospital, 130, Dongduk-ro, Jung-gu, Daegu - 41944, Republic of Korea. E-mail: ryuhsung138@gmail.com

REFERENCES

1. Wyllie JW 3rd, Kern EB, Djalilian M. Isolated sphenoid sinus lesions. *Laryngoscope* 1973;83:1252-65.
2. Chen L, Jiang L, Yang B, Subramanian PS. Clinical features of visual disturbances secondary to isolated sphenoid sinus inflammatory diseases. *BMC Ophthalmol* 2017;17:237.
3. El Mograbi A, Soudry E. Ocular cranial nerve palsies secondary to sphenoid sinusitis. *World J Otorhinolaryngol Head Neck Surg* 2017;3:49-53.

4. Braun JJ, Debry C, Imperiale A, Riehm S. Imaging sphenoid diseases. *Clin Radiol* 2018;73:761-72.
5. Digre KB, Maxner CE, Crawford S, Yuh WT. Significance of ct and mr findings in sphenoid sinus disease. *AJNR Am J Neuroradiol* 1989;10:603-6.
6. Levine H. The sphenoid sinus, the neglected nasal sinus. *Arch Otolaryngol* 1978;104:585-7.
7. Urushidani S, Kuriyama A. Trismus in sphenoid sinusitis. *Am J Med* 2016;129:e23-4.
8. Yong WW, Zhou SH, Bao YY. Sphenoid sinus mucocoele presenting with oculomotor nerve palsy and affecting the functions of trigeminal nerve: A case report. *Int J Clin Exp Med* 2015;8:16854-7.
9. Fawaz SA, Ezzat WF, Salman MI. Sensitivity and specificity of

computed tomography and magnetic resonance imaging in the diagnosis of isolated sphenoid sinus diseases. *Laryngoscope* 2011;121:1584-9.

Video available on: www.annalsofian.org

Submitted: 20-Aug-2019 **Revised:** 28-Oct-2019

Accepted: 29-Oct-2019 **Published:** 10-Jun-2020

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

DOI: 10.4103/aian.AIAN_441_19