The sinus headache is a widely accepted diagnosis among patients and primary-care physicians. Contrary to general belief, the cases that fulfilled the International Headaches Society (IHS) criteria for "headache attributed to acute rhinosinusitis" is uncommon [1]. Sinus involvement has not been proven in up to 90% of self- or health-care provider-diagnosed sinus headaches, which often satisfy the IHS criteria for migraine [1]. Furthermore, sinus headaches are generally self-limiting [2]. Based on these findings, the relevance of sinus headache has declined steadily in the medical community [2]. However, headache caused by sphenoid sinusitis is a different matter. Sphenoid sinusitis may be a potentially serious disorder, which typically affects preadolescent and adolescent patients and may cause loss of vision, permanent multiple craniohypathies, and intracranial spread [3]. Most patients with sphenoid sinusitis present with headache; however, the symptoms are variable [3]. Physical examination, such as palpation of the face, is generally not useful for the detection of sphenoid sinus pathology due to its anatomical location [3]. Therefore, unless pediatric neurologists have a high suspicion of sphenoid sinusitis as the cause of a headache, treatment can be delayed with potentially fatal consequences. Here, we report the case of an adolescent male with severe headache and intractable facial pain that was resistant to medical treatment who recovered immediately after surgical management of sphenoid sinusitis.

A 12-year-old male visited the emergency room with a 7-day history of progressive headache and fever that developed an hour before arrival. On initial assessment, his body temperature was 38.4°C, the white blood cell count was 11,210/mm³, and his C-reactive protein (CRP) level was 2.8 mg/L (normal limit, 0 to 5). His neurological examination was unremarkable, including no signs of meningeal irritation and normal cerebrospinal fluid examination. He complained severe throbbing headache in the right temporal and occipital regions, sensitivity to light, and nausea. He had no history of the previous headache. Facial tenderness or pain, and post-nasal drip were not observed. The headache was aggravated by not only physical activity but also lying down. Magnetic resonance imaging (MRI) revealed opacity of the right ethmoid sinus, left maxillary sinus, and bilateral sphenoid sinuses, but was otherwise normal (Fig. 1). The patient was treated with ampicillin/sulbactam and ketorolac based on the possibility of status migrainosus with acute bacterial infection of the paranasal sinuses. However, after admission, his clinical course progressed rapidly: fever persisted up to 40°C, his CRP levels increased to 50 mg/
dL, and the severity of the headache intensified in the right tempo-
ral region of his head. On day 3 of admission, the patient appeared
septic and complained of pain in the right retro-orbital region and
face. Because the aching facial pain was consistent with the distri-
bution of the trigeminal nerve, we strongly suspected sphenoid si-
inusitis as the cause of the headache and facial pain. The patient un-
derwent emergency endoscopic surgery and was treated with van-
comycin (40 mg/kg/day) and metronidazole (30 mg/kg/day). A
large amount of pus was drained from the right ethmoid and sphen-
oid sinuses; however, no bacteria was cultured from his specimen.
After surgical intervention, all of the symptoms, including the fever,
improved rapidly. He was discharged on the 9th day of admission
without complications. Written informed consent by the patients
was waived due to a retrospective nature of our study.

Our case met the IHS criteria for “headache attributed to acute
rhinosinusitis" in terms of the ipsilateral location of the headache
(right temporal and retro-orbital regions), purulent material in the
right ethmoid and sphenoid sinuses, and the symptoms improved
immediately after surgical drainage of the sinuses. Other several
symptoms and signs also support sinusitis as the cause of his head-
ache: no previous headache history, progressive headache with fe-
ver, worsening pain in lying down position, and the MRI findings
of paranasal sinus pathology. Nevertheless, sinus headache was not
an initial diagnostic impression of this patient.

Sinusitis rarely causes headache when the sinus in question cannot
-drain [2]. Purulent nasal discharge is the exception rather than the
rule in sphenoid sinusitis [3]. The typical location of headache
associated with sphenoid sinusitis is the vertex, and the pain may
be hemicranial [3]. However, it should be noted that the presence
of nasal discharge and headache location in relation to specific si-
nus structures as signs of sinus headache were omitted from the re-
vised IHS classification system [4]. Conversely, the presence of su-
perficial aching hemifacial pain, consistent with the distribution of
the trigeminal nerve and retro-orbital pain, are definitive signs of a
headache attributable to acute rhinosinusitis, particularly with
sphenoid involvement. The sensory innervation of the sphenoid
sinus is derived from the ophthalmic and maxillary divisions of the
trigeminal nerve. Trigeminal nerve involvement thought to be
linked with a headache caused by sinusitis as well as migraine, may
be one reason why the two are easily confused [5]. It is well known
that migraines are frequently mistaken for sinus headaches [1].
However, there seems to be a lack of awareness that sphenoid si-
inusitis is like masquerading as a migraine [5]. We initially suspec-
ed migraine, rather than sinus headache, in our patient due to the
unilateral headache and photophobia. Unlike migraine, delayed
treatment for acute sphenoid sinusitis can cause serious morbidity.
The sphenoid sinus is adjacent to several crucial structures that
may be affected by sphenoid sinusitis, including cranial nerves II,
III, IV, V, and VI; the cavernous sinus; optic canals; dura mater;
and the internal carotid artery [3]. The spread of infection to these
structures can lead to significant complications [3]. Surgical inter-
vention should be performed immediately in patients; if during the
antibiotic therapy, the symptoms get worse or continue for 24 to
48 hours or if there are signs of complications [3]. Our patient’s
symptoms were intractable to medical treatment but improved im-
mediately after surgical drainage.

Neurologists are generally skeptical of sinus headaches, which
may result in their underdiagnosis in clinical practice. However,
sphenoid sinusitis may be a potentially devastating disease, and
headache is the most common presenting symptom. Our case is a
reminder that pediatric neurologists need to have a high index of
suspicion when patients with headache took unusual clinical cours-
es of sphenoid sinus involvement.

Conflicts of interest

No potential conflict of interest relevant to this article was reported.

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