Case presentation:
An 8 year old boy presented to the emergency department with few days history of severe headache. Pain is described as fronto-occipital, continuous and not relieved by pain medications. It’s associated with nausea, vomiting and high grade fever. No blurred vision, no dizziness, no diarrhea and no other associated symptoms. Physical findings were pertinent for fever of 39°C and facial tenderness over the frontal area with no meningeal signs. His pediatrician asked for a CT scan of brain and sinuses which revealed right isolated sphenoid opacification (fig. I).

He was sent home on Amoxicillin-Clavulanic acid and antipyretics. However the patient presented to the emergency unit 3 days later because of persistent severe occipital headache. The ENT team was consulted at this moment to evaluate the patient.

On physical exam, he was awake and oriented, afebrile, no meningeal or focal neurological signs. His nose was congested otherwise his exam was within normal limits.

Blood studies revealed a white blood cells count of 7000 with 67% segmented and CRP = 71.4 mg/L.

CT scan of sinuses was repeated and revealed same findings (fig.2)
The patient was admitted for intravenous antibiotics and started on Ceftriaxone and Clindamycin, nasal decongestant and pain medications. Patient improved and became free of pain and fever after 48 hours. He was discharged home after few days on Cefpodoxime and Clindamycin for a total of 3 weeks. He stayed free of symptoms until completion of treatment, then follow up CT scan revealed clearance of his sphenoid disease (fig.3)

DIAGNOSIS: Isolated acute sphenoid sinusitis.
Discussion:

Sphenoid sinusitis is an uncommon entity in children. Van Alyea described the sphenoid sinus as the most neglected sinus [1]. Sphenoid sinusitis affects children in their pre-adolescent and adolescent age, since its formation started to be clinically apparent between the age of 5 and 15 years [5], it reaches its adult size by puberty. The low incidence of isolated sphenoiditis is due to its deep position away from the current of nasal secretions, irritants and pathogens [2]. The low rate of sphenoiditis is also explained by the low secretion rate of its lining mucosa and therefore decreased drainage problems as compared to other paranasal sinuses [13].

In its anatomical position, the sphenoid sinus is surrounded by 13 important structures that may be involved by the diseased sinus. These structures include: the pituitary gland, the optic nerve and chiasm, the dura mater, the cavernous sinus, the internal carotid artery, the third, fourth, and sixth cranial nerves, the ophthalmic and maxillary nerves, the sphenopalatine ganglion, the sphenopalatine artery, and the pterygoid nerve.

The clinical presentation of isolated sphenoiditis is usually vague and non-specific making the diagnosis often delayed [7]. The presentation ranges from the non-severe form with headache being the most common, to the severe form with headache, fever and any manifestation related to involvement of adjacent structures [14]. Persistent headache, not responding to medical treatment and awakening patients at night should prompt the diagnosis of isolated sphenoid sinusitis among other cranial pathologies [8,11]. The location of headache is variable and inconsistent [7]. Headache is often associated with facial and orbital pain as well as visual symptoms including blurred vision, photophobia and diplopia [8,11]. Other presenting symptoms are related to complications that can be serious and these include blindness, ophtalmoplegia, cavernous sinus thrombosis, meningitis, cerebral infarction and cranial nerves palsy (III, IV, V and VI) [7,14].

Predisposing factors are those related to anatomical obstruction to sphenoid drainage (septal deviation, large superior and middle turbinate), traumatic or surgical injury, history of sinusitis and/or allergic rhinitis.
Swimming and diving were related to isolated sphenoiditis in children due to forceful introduction of pathogens [6,7, 14].

High resolution CT and MRI are the main diagnostic tools to assess the extent of the disease as well as the presence eventual complication [3,12]. Nasal endoscopy, although not well tolerated by children, can be helpful to visualize the sphenoid recess [4]. The most common organisms found in acute sphenoiditis is *Staphylococcal Aureus*, followed by *Streptococcal* species and less frequently Gram-negative and anaerobs. Fungal infection, mainly Aspergillus, should be considered in immunocompromised patients [7,10,11].

Uncomplicated acute sphenoiditis can be treated with 3-4 weeks of antibiotics directed against the most common pathogens. Surgical drainage should be considered if no clinical improvement in 24-48 hours or in case of emergence of complication [8,9].

In conclusion, acute isolated sphenoid sinusitis in children is a rare but serious condition. Its unspecific presentation may delay the diagnosis and can lead to devastating complications. Acute isolated sphenoiditis should be considered in the differential diagnosis of persistent and refractory headache.
REFERENCES:

1. O.E. Van Alyea, Sphenoid sinus: anatomic study, with consideration of the clinical significance of the structural characteristics of the sphenoid sinus, Arch. Otolaryngol. 34 (1941) 225—253.