

Clinical Conundrum: Pediatric Headache

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Disclosures

No financial relationships to disclose!

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Initial Presentation:

4yo female with headache

- 4 year old previously healthy female, UTD vaccines
- 4 days of severe headache
 - Localized to cranial vertex
 - Increased w/ positional changes
 - Wakes her from sleep
 - Minimal change w/ Tylenol
- Emesis x1 today
- Tmax 102 f
- URI 2 weeks prior
- Report of R eye ptosis that spontaneously resolved
- Seen by PCP earlier that day
 - Febrile
 - Lethargic
- Direct admit to hospital medicine

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Exam

Vitals

- 102.9 F
- HR 104
- RR 23
- BP 111/71

Exam

- Gen: ill appearing, moaning in dark room
- HEENT: no facial TTP, no TM erythema/bulging
- Neuro: nonfocal though participation limited by irritability
- Heme: no lymphadenopathy

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Differential Diagnosis

- Migraine
- Meningitis
- Encephalitis
- Intracranial hemorrhage
- Space occupying intracranial lesion
- Increased ICP

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Notable Labs

- CBC:
 - WBC 14k
 - Neutrophil predominance
- Inflammatory markers
 - CRP 12.6 mg/dL
 - ESR 59 mm/hr
- LP
 - Normal opening pressure
 - WBC: 0
 - Protein/glucose normal
- MEP: negative

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Imaging

Non-contrast CT head

- Moderate opacification of bilateral ethmoid and maxillary sinuses without acute intracranial process

MRI brain w/ contrast

- Confirmed sinusitis noted on CT
- Noted involvement of the bilateral sphenoid sinuses as well as associated epidural abscesses

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Imaging

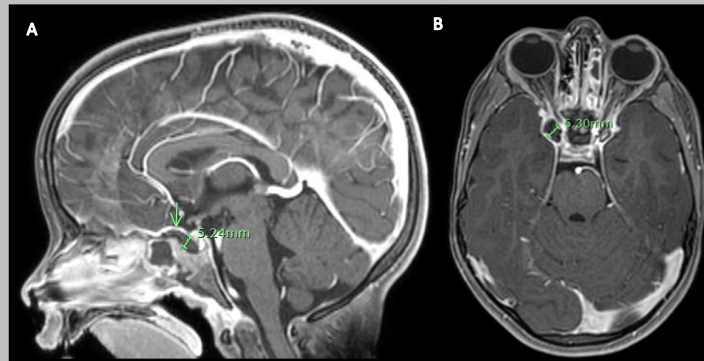


Figure 1. MRI Brain with and without contrast demonstrating epidural abscesses. (A) The sagittal T1 image shows a rim-enhancing collection, measuring 5.24mm, along superior right aspect of the basisphenoid bone that involves the sella and displaces the anterior pituitary. (B) The post-gadolinium axial T1 image shows a second rim-enhancing collection, measuring 6.3mm, between the anterior medial right temporal lobe and right optic nerve foramina.

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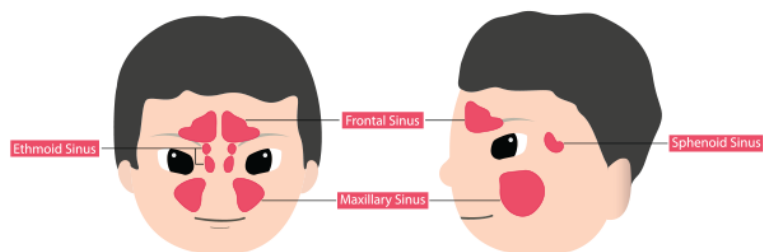
Diagnosis

- Complicated bacterial sinusitis with epidural abscesses
 - Broad spectrum antibiotics
 - Sinus debridement

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Pediatric sinusitis

Paranasal Sinuses



Ethmoid: 0-2y, puberty⁴
* newborn⁵

Maxillary: neonate-puberty⁴
* 7-12 mo⁵

Sphenoid: 2y-puberty⁴
* 1-2 yo⁵

Frontal: 2y-puberty⁴
* 14-15 yo⁵

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Pediatric sinusitis

- 2+ symptoms: purulent secretions, unilateral predominance, severe local pain, fever, <12 weeks, elevated inflammatory markers, cough
- URI symptoms >10 days
- Pathogens: *S. pneumo*, *H. flu*, *M. catarrhalis*
- Tx: antibiotics, saline sprays, intranasal steroids
- Complications:
 - Orbital: preseptal cellulitis, orbital cellulitis*
 - Intracranial: epidural, subdural, or brain abscesses; meningitis; cerebritis
 - Osseous: osteomyelitis
- Imaging:
 - CT head (high accuracy for orbital complications)
 - MRI brain (sensitive for intracranial complications)

Ramadan, et al. 2022

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Pediatric Headache Red Flags

TABLE 3 - Red Flag Finding's Prediction of the Serious Intracranial Diseases (n=40)

Red Flag Finding	Yes, n (%)	No, n (%)	OR	95% CI	P
★ <6 y	4 (10)	36 (90)	2.53	0.16-39.93	0.509
★ Vomiting	27 (67.5)	13 (32.5)	9.42	1.90-46.63	0.006
★ Headache wakes from sleep	6 (15)	34 (85)	0.10	0.01-1.08	0.058
Lack of parents primary headache history	33 (82.5)	7 (17.5)	1.49	0.28-7.81	0.637
★ Headache precipitated by position, valsalva, coughing	7 (17.5)	33 (82.5)	1.24	0.03-42.51	0.902
★ Onset recently or suddenly severe headache	23 (57.5)	17 (42.5)	14.41	3.14-65.91	0.001
Occipital location	6 (15)	34 (85)	1.94	0.22-16.87	0.548
Progressive	12 (30)	28 (70)	1.022	0.000-	0.998
Abnormal neurological physical examination	36 (90)	4 (10)	187.57	32.67-1076.64	<0.001

Güngör, et al. 2022

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Clinical pearls

- Always consider sinusitis as cause of headache regardless of age⁵
- Sphenoid sinusitis often has non-specific or confusion presentation, need to have high suspicion when assessing kids with headaches⁶
 - Often do not have facial pain/tenderness⁶
 - Can present with vertex headache, as in this case^{2, 8}
 - Can have associated cranial nerve palsies (II, III, IV, VI)⁶
- Normal CSF findings do not rule out intracranial abscess¹

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References

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