CLINICAL VIGNETTE

A Woman with Diabetes and a New Headache

Loc Duong, MD

Background

Sinusitis is one of the most common conditions treated by primary care physicians. Every year, sinusitis affects one in seven adults and is diagnosed in 31 million people.[1] Intracranial complications arising from sinusitis have decreased drastically due to widespread availability and usage of antibiotics, however mortality from the complications of sinusitis continues to be high. Before the advent of antibiotics, morbidity in patients with intracranial complications of sinusitis was 80%, currently it is approximately 30%.[1]

Acute sinusitis is defined as an infection lasting less than 4 weeks, subacute sinusitis lasts 4-12 weeks, and chronic sinusitis lasts longer than 12 weeks.[2,3] Viral sinusitis comprises the majority of cases and is usually self-limiting. Intracranial complications are most commonly due to bacterial infection and include suppurative disease with brain abscess, epidural abscess, subdural empyema and non-suppurative complications of meningitis and cerebral venous thrombus. Streptococcus pneumonia, Haemophilus influenza, and Moraxella catarrhalis are the most commonly identified causative pathogens. The incidence of neurologic complications is approximately 3.7% in patients hospitalized with sinusitis, with incidence of intracranial abscess secondary to sinusitis is 14.6%.[2,3]

Case

A 66-year-old woman was found obtunded in her car. One month before she presented to the office with new right-sided occipital headache. The headache had started one week prior and she reported increase in work-related stress and persistently sleeping on her right side. She denied any neck pain, fatigue or fevers. She also denied any recent upper respiratory infection, sinus congestion or sinus pain. Past medical history included poorly controlled diabetes, hypertension, obesity, hyperlipidemia, depression and anxiety.

She had a remote history of migraines which generally affected her forehead and felt different in character from her new headache. Vital signs on the date of initial exam included blood pressure 147/76, heart rate 95, temperature 97.7F, O2 saturation 98%. Physical exam included full range of motion of the neck with no pain with neck flexion or palpation. Her maxillary and frontal sinus were non-tender to palpation, and her scalp and neck were also non-tender to palpation. In consideration of her age, comorbidities, and the acute onset of her headache, MRI brain without contrast was ordered and the patient was referred to neurology. Acetaminophen had been helping with her headache, which I advised her to continue as needed. Brain MRI was completed the next day and showed no acute process. There was partial opacification of the right frontal sinus and right ethmoid bed. When the patient was called with these results, she denied having any pain in her face and reported her headache was improving. Due to a lack of localized sinus pain that corresponded to the MRI finding, the opacification was thought to be an incidental finding without clinical correlate. The headache was treated as a tension headache with recommendation for continued conservative pain management with acetaminophen as needed.

Two weeks later, the patient was found obtunded in her car by a pedestrian bystander. One day prior, her daughter had noticed that she seemed pale and her right cheek seemed swollen, but the patient avoided ER evaluation due to a surge in the COVID pandemic. After being found obtunded, EMS transported her to a local hospital ED. Studies included MRI brain showing a right frontal abscess, right ethmoid sinusitis eroding into the anterior skull base, and CSF culture positive for Strep pneumococcus. Transthoracic echocardiogram showed no vegetations. Due to her clinical improvement and the small size of her abscess, the neurosurgical team at the outside hospital declined surgical intervention and she was discharged home with Dexamethasone and intravenous Ceftriaxone.

I saw the patient 2 days after she was discharged from the hospital. She was continuing Ceftriaxone IV treatment but complained of daily headaches and had difficulty with blood glucose control. Due to her persistent headaches, poorly controlled diabetes on Dexamethasone, and concern for inadequate source control, she was directed to the emergency department at our institution. She was driven by her daughter to the ED, where MRI that evening showed a right inferior frontal lobe abscess measuring 2.8cmx1.7cmx2.4cm with extension to the right ethmoid air cells. The next day, she underwent frontal craniotomy and abscess drainage and continued Ceftriaxone IV as well as Flagyl. Approximately one month later, she had endoscopic endonasal repair of the skull base defect. The patient's headaches resolved and she did not have complications from the skull base repair. MRI brain one month later showed full resolution of her right frontal abscess.

Discussion

This case demonstrates the potential difficulty of diagnosing sinusitis and treating its complications, as well as the potential value of strict return precautions in complex patients with novel symptoms. According to the American Academy of Oto-laryngology, the symptoms of sinusitis are purulent nasal drainage accompanied by facial pain, pressure, or fullness; nasal obstruction; or both.[4,5] At the initial office visit, the patient did not clearly exhibit any of these symptoms. Her MRI showed partial opacification of the right frontal sinus and ethmoid bed when the location of her headache was occipital, which was assessed to be an incidental finding. Studies report that up to 66% of the population may have an incidental finding of sinus opacification.[6] She reported an improvement in her headache during telephone follow-up for her MRI. However, the headaches subsequently returned and persisted, without her informing her primary care physician. With older patients with diabetes, hypertension and a new neurologic symptom, providing clear guidelines for returning to clinic or seeking advanced care may have resulted in earlier treatment of a less complicated stage of her disease.

REFERENCES

1. **Ziegler A, Patadia M, Stankiewicz J**. Neurological Complications of Acute and Chronic Sinusitis. *Curr Neurol Neurosci Rep*. 2018 Feb 5;18(2):5. doi: 10.1007/s11910-018-0816-8. PMID: 29404826.
2. **Zunt JR, Baldwin KJ**. Chronic and subacute meningitis. *Continuum (Minneap Minn)*. 2012 Dec;18(6 Infectious Disease):1290-318. doi: 10.1212/01.CON.0000423848.17276.21. PMID: 23221842.
3. **Fokkens WJ, Lund VJ, Hopkins C, Hellings PW, Kern R, Reitsma S, Toppila-Salmi S, Bernal-Sprekelsen M, Mullol J, Alobid I, Terezinha Anselmo-Lima W, Bachert C, Baroody F, von Buchwald C, Cervin A, Cohen N, Constantinidis J, De Gabory L, Desrosiers M, Diamant Z, Douglas RG, Gevaert PH, Hafner A, Harvey RJ, Joos GF, Kalogjera L, Knill A, Kocks JH, Landis BN, Limpens J, Lebeer S, Lourenco O, Meco C, Matricardi PM, O'Mahony L, Philpott CM, Ryan D, Schlosser R, Senior B, Smith TL, Teeling T, Tomazic PV, Wang DY, Wang D, Zhang L, Agius AM, Ahlstrom-Emanuelsson C, Alabri R, Albu S, Alhabash S, Aleksic A, Aloulah M, Al-Qudah M, Alsaleh S, Baban MA, Baudoin T, Balvers T, Battaglia P, Bedoya JD, Beule A, Bofares KM, Braverman I, Brozek-Madry E, Richard B, Callejas C, Carrie S, Caulley L, Chussi D, de Corso E, Coste A, El Hadi U, Elfarouk A, Eloy PH, Farrokhi S, Felisati G, Ferrari MD, Fishchuk R, Grayson W, Goncalves PM, Grdinic B, Grgic V, Hamizan AW, Heinichen JV, Husain S, Ping TI, Ivaska J, Jakimovska F, Jovancevic L, Kakande E, Kamel R, Karpischenko S, Kariyawasam HH, Kawauchi H, Kjeldsen A, Klimek L, Krzeski A, Kopacheva Barsova G, Kim SW, Lal D, Letort JJ, Lopatin A, Mahdjoubi A, Mesbahi A, Netkovski J, Nyenbue Tshipukane D, Obando-Valverde A, Okano M, Onerci M, Ong YK, Orlandi R, Otori N, Ouennoughy K, Ozkan M, Peric A, Plzak J, Prokopakis E, Prepageran N, Psaltis A, Pugin B, Raftopulos M, Rombaux P, Riechelmann H, Sahtout S, Sarafoleanu CC, Searyoh K, Rhee CS, Shi J, Shkoukani M, Shukuryan AK, Sicak M, Smyth D, Sindvongs K, Soklic Kosak T, Stjarne P, Sutikno B, Steinsvag S, Tantilipikorn P, Thanaviratananich S, Tran T, Urbancic J, Valiulius A, Vasquez de Aparicio C, Vicheva D, Virkkula PM, Vicente G, Voegels R, Wagenmann MM, Wardani RS, Welge-Lussen A, Witterick I, Wright E, Zabolotniy D, Zsolt B, Zwetsloot CP**. European Position Paper on Rhinosinusitis and Nasal Polyps 2020. *Rhinology*. 2020 Feb 20;58(Suppl S29):1-464. doi: 10.4193/Rhin20.600. PMID: 32077450.
4. **Jaume F, Quintó L, Alobid I, Mullol J**. Overuse of diagnostic tools and medications in acute rhinosinusitis in Spain: a population-based study (the PROSINUS study). *BMJ Open*. 2018 Jan 31;8(1):e018788. doi: 10.1136/bmjopen-2017-018788. PMID: 29391364; PMCID: PMC5878244.
5. **Rosenfeld RM, Andes D, Bhattacharyya N, Cheung D, Eisenberg S, Ganiats TG, Gelzer A, Hamilos D, Haydon RC 3rd, Hudgins PA, Jones S, Krouse HJ, Lee LH, Mahoney MC, Marple BF, Mitchell CJ, Nathan R, Shiffman RN, Smith TL, Witsell DL**. Clinical practice guideline: adult sinusitis. *Otolaryngol Head Neck Surg*. 2007 Sep;137(3 Suppl):S1-31. doi: 10.1016/j.otohns.2007.06.726. PMID: 17761281.
6. **Hansen AG, Helvik AS, Nordgård S, Bugten V, Stovner LJ, Håberg AK, Gårseth M, Eggesbø HB**. Incidental findings in MRI of the paranasal sinuses in adults: a population-based study (HUNT MRI). *BMC Ear Nose Throat Disord*. 2014 Nov 25;14(1):13. doi: 10.1186/1472-6815-14-13. PMID: 25674037; PMCID: PMC4324827.