

CLINICAL VIGNETTE

A Case of Enterobacter Bacteremia after Nasal Polyp Removal

William Reid, MD and Vignesh Raghunath, MD

Case

A 53-year-old man without significant medical history, presented to the ER for a bilateral frontal headache two days after undergoing sinus surgery to remove a benign polyp. He tolerated the surgery well and post-operatively had nasal packing applied before being discharged home. One day prior, he reported feeling generally unwell but denied any neurological symptoms including headache or altered mental status. On the day of admission, the patient developed an 8/10 bilateral frontal pounding headache, which brought him to the emergency room. After arrival he quickly became diaphoretic, tachypneic, and agitated. At that time further history could not be obtained from the patient due to his altered mental status. Additional information was obtained from the patient's friend. She reported that the patient had not complained of fevers or chills, had no sick contacts, no recent travel, and no history of illicit or intravenous drug use. He had no significant past medical history and no significant family history of disease. He worked in an office and had no clear environmental exposures.

On physical exam, his temperature was 39.2 C, pulse 116 bpm, respiratory rate of 18, blood pressure 134/64 mmHg, and his oxygen saturation was 99% on room air. He was altered and combative with staff. He was able to respond verbally and responded to his name. Although his words were clear, they were incoherent in terms of content. Extraocular movements appeared intact, conjunctivae were anicteric. Pupils were 3 mm bilaterally, and reactive to light bilaterally. He had a small amount of dried blood in his nares but no drainage. There was no jugular venous distention and no supraclavicular or infraclavicular lymphadenopathy. Cardiac exam showed tachycardia with a 2/6 systolic murmur at the left upper sternal border consistent with a hyperdynamic heart. Lungs were clear to auscultation bilaterally with good air movement and no wheezes, rales, or rhonchi. His abdomen was soft, non-tender, non-distended, positive bowel sounds with no rebound, guarding, or hepatosplenomegaly. He had good peripheral pulses and refill. He could not follow commands for a complete neurological exam. He was moving all four extremities spontaneously. Strength appeared to be intact, though he had to be restrained in the upper extremities. Sensation could not be assessed.

Labs were significant for a white blood count of 14.2 K/ul with 68% neutrophils and a hemoglobin of 15.2 g/dl. Basic metabolic panel, liver function tests, and INR were all unremarkable. Initial lactate was 5.4 mmol/L. Blood cultures were drawn.

Chest X-ray was unremarkable. Head CT showed no evidence of intracranial hemorrhage, mass effect or midline shift but did show near complete opacification of the right ethmoid air cells. Mild mucosal thickening is seen in the right maxillary and right sphenoid sinuses. CT Angiogram of the head and neck showed evidence of dehiscence of the right cribriform plate/lateral lamella. An EKG was unobtainable secondary to patient movement but the patient appeared to be in sinus tachycardia on the telemetry monitor. A lumbar puncture was done. CSF studies came back with WBC 3,851/cmm, Lymphocytes 4%, Macrococytes 6%, Neutrophils 88%, Glucose 20 mg/dl, Protein 724 mg/dl.

In the ER he was started on IV fluids as well as broad spectrum antibiotics with Vancomycin, Cefepime, and Clindamycin. The patient was then admitted for suspected meningitis. On hospital Day #2, 2/2 bottles were positive for pan sensitive enterobacter cloacae. CSF culture was negative. He was switched to Ceftriaxone and completed a 5 day course. The patient did well overall. His mental status returned back to normal by hospital day 2. His WBC went down to 9.7 on day of discharge.

Discussion

Enterobacter cloacae is a gram-negative rod that is facultatively anaerobic and is a normal part of the gut flora for most humans. However, Enterobacter cloacae can cause infections in humans including pneumonia, skin and soft tissue infections, endocarditis, bacteremia, and intra-abdominal and urinary tract infections.¹ Enterobacter as a source of infections in humans first came to national attention in a series of outbreaks in the early 1970s.²

We reviewed the literature for bacteremia after nasal surgery, specifically from Enterobacter infections. Investigators have reported the rate of both bacteremia after rhinoplasty³ and peri-operative antibiotic use in rhinosurgery in general.⁴ One study suggested the risk of peri-operative infection was so low in septoplasty that routine antibiotics are unnecessary.⁵ We did find one case report of Enterobacter cloacae infection complicated by septum perforation after septoplasty.⁶ However, we were unable to find any case series of bacteremia after nasal polyp removal.

Aminoglycosides are historically the most effective against Enterobacter cloacae. Other antibiotics with good rates of

coverage include Cefepime, Imipenem, and Ciprofloxacin.¹ Enterobacter is becoming increasingly associated with multi drug resistance, with resistance to carbapenems being of particular concern. However, our patient's Enterobacter was pan-sensitive with the following sensitivities: Ceftazadime (≤ 1), Ceftriaxone (≤ 1), Gentamicin (≤ 1), Levofloxacin (≤ 0.12), Meropenem (≤ 0.25), Piperacillin + Tazobactam (≤ 4), Tobramycin (≤ 1), Trimethoprim + Sulfamethoxazole (≤ 20). In our case, Infectious Disease consultant felt that the nasal packing, which was promptly removed, may have played a role in his infection. The patient remained in the hospital for 3 more days monitoring blood cultures and neurological symptoms. Follow-up blood cultures were negative. He remained afebrile and at his baseline mental status with gradual improvement in headache during hospitalization. The patient completely recovered and was discharged home.

REFERENCES

1. **Paauw A, Caspers MP, Schuren FH, Leverstein-van Hall MA, Delétoile A, Montijn RC, Verhoef J, Fluit AC.** Genomic diversity within the Enterobacter cloacae complex. *PLoS One*. 2008 Aug 21;3(8):e3018. doi: 10.1371/journal.pone.0003018. PubMed PMID: 18716657; PubMed Central PMCID: PMC2515634.
2. **Maki DG, Rhame FS, Mackel DC, Bennett JV.** Nationwide epidemic of septicemia caused by contaminated intravenous products. I. Epidemiologic and clinical features. *Am J Med*. 1976 Apr;60(4):471-85. PubMed PMID: 1274981.
3. **Slavin SA, Rees TD, Guy CL, Goldwyn RM.** An investigation of bacteremia during rhinoplasty. *Plast Reconstr Surg*. 1983 Feb;71(2):196-8. PubMed PMID: 6823479.
4. **Bandhauer F, Buhl D, Grossenbacher R.** Antibiotic prophylaxis in rhinosurgery. *Am J Rhinol*. 2002 May-Jun;16(3):135-9. PubMed PMID: 12141769.
5. **Caniello M, Passerotti GH, Goto EY, Voegels RL, Butugan O.** Antibiotics in septoplasty: is it necessary? *Braz J Otorhinolaryngol*. 2005 Nov-Dec;71(6):734-8. PubMed PMID: 16878241.
6. **Binar M, Arslan F, Tasli H, Karakoc O, Kilic A, Aydin U.** An unusual cause of necrosis and nasal septum perforation after septoplasty: Enterobacter cloacae. *New Microbes New Infect*. 2015 Jul 16;8:150-3. doi: 10.1016/j.nmni.2015.07.002. eCollection 2015 Nov. PubMed PMID: 27257495; PubMed Central PMCID: PMC4877400.