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PHOTO QUIZ

PEER REVIEWED

A Boy With Sudden-Onset Left Otalgia and Otorrhea

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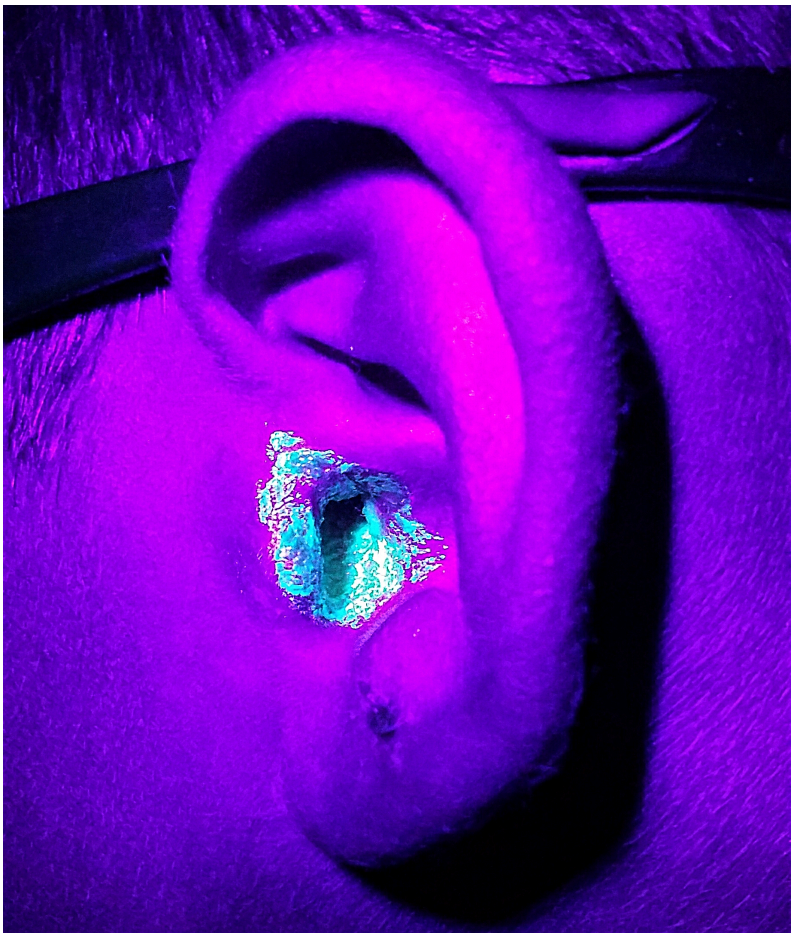
A 9-year-old boy was brought to a primary care office by his mother. The patient had complained of self-limited sudden left otalgia the day before his visit. The mother was unsure whether the patient had had fever or not. However, she noticed thick otorrhea from the left ear. The patient had received only acetaminophen for the pain. His medical history was positive only for hyperopia and attention-deficit/hyperactivity disorder, and he was fully up-to-date with immunizations.

The physical examination showed vital signs within the normal ranges. The patient denied pain during passive traction to the left pinna. A sample of the discharge was sent for culture and identification. Otoscopy examination showed a foul-smelling yellowish discharge in the left ear canal, without erythema of the canal walls, and a minuscule puncture on a mildly erythematous tympanic membrane. The external ear was later examined using a Wood lamp (**Figure**).



What is the most likely diagnosis?

A. Uncomplicated acute otitis externa

B. Acute otitis media (AOM)

C. AOM due to Pseudomonas aeruginosa with tympanic perforation

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Answer: AOM due to *P aeruginosa* with tympanic perforation

The attending physician, based on antibiotic susceptibility results, began treatment with ciprofloxacin, 0.3% plus fluocinolone acetonide 0.025% otic solution twice daily for 7 days and asked the parent to bring her son back for a follow-up visit in 3 days.

During the follow-up visit, the patient did not present with ear discharge, and the tympanic perforation had almost closed. Culture test results identified *P aeruginosa*.

DISCUSSION

AOM is one of the most frequent bacterial infections seen in children worldwide.[1-4] It affects up to 4 of 5 children by the age of 3 years.[2,4] Middle ear bacterial infections frequently originate from the upper respiratory tract due to asymptomatic nasopharyngeal colonization.[5,6] Because of a shorter and more horizontal eustachian tube, children are more prone to develop AOM.[5] Spontaneous otorrhea occurs in 3.3% to 52% of children with AOM.[4]

After the introduction of the pneumococcal conjugated vaccine, which has reduced the burden of pneumococcal disease,[3,4] the microbiology of the condition has shifted, and the most commonly involved bacteria are *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Streptococcus pyogenes*, *Moraxella catarrhalis*, and *Staphylococcus aureus*.[1,3,4,7,8] *P aeruginosa* is not frequently seen as the pathologic organism of AOM in the developed world, but it is prevalent in developing countries, where can be the culprit in 14.5% to 60% of cases.[5,9-14] It frequently causes otorrhea,[14] and most cases (32.5%-49%) occur in those younger than 10 years.[5,14]

P aeruginosa is an aerobic, gram-negative, motile, non–spore-forming, oxidase-positive, and lactose non-fermenting bacterium that produces pyocyanin and pyoverdine,[15] both of which

are water-soluble pigments that fluoresce under a Wood ultraviolet lamp (which emits a light radiation between 320 and 400 nm, with a peak at 365 nm) that gives the typical yellow-green color.[15,16] *P aeruginosa* fluorescence is detected if the bacterial load exceeds 10^5 colony forming units/cm^2.[15]

The susceptibility of *P aeruginosa* to ciprofloxacin ranges from 85% to 97%,[5,13,17,18] with 2% of strains being resistant.[18] However, the widespread use of otic drops has promoted the emergence of *P aeruginosa* resistant to this antibiotic.[19]

The median time for otorrhea cessation using ciprofloxacin/dexamethasone is 4 days, and the improved/cured rate is 93.7% at day 3 and 96.2% at day 11.[17]

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