

# MORGANELLA MORGANII, SUBSPECIES MORGANII, BIOGROUP A: AN UNUSUAL CAUSATIVE PATHOGEN OF OTITIS EXTERNA

Otology

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## Özet

OTİTİS EKSTERNAYA NEDEN OLAN SIRADIŞI BİR PATOJEN: MORGANELLA MORGANII

Otitis eksterna kulak burun boğaz hekimlerinin pratikte sıkça karşılaştıkları dış kulak yolu kanalının çeşitli patojenlere bağlı enfeksiyonudur. Morganalle Morganii gastrointestinal sistemin doğal florasında bulunan, nadiren tek başına enfeksiyon kaynağı olmakla birlikte genellikle immünitesi baskılanmış kişilerde, hastane enfeksiyonlarında ya da süperenfeksiyonlarda karşımıza çıkan gram (-) fakültatif aerobik basildir. Genellikle İdrar yolu enfeksiyonları ve piyojenik enfeksiyonlar da rol alır, bizim literatür taramalarımıza göre otitis eksternaya neden olduğunu gösteren bir çalışma bulunmamaktadır. Bu yazıda Morganella morganii'nin neden olduğu otitis eksternalı bir olgunun literature ile paylaşılması amaçlanmıştır.

**Anahtar kelimeler:** Akut otitis externa, Morganella morganii

## Abstract

MORGANELLA MORGANII, SUBSPECIES MORGANII, BIOGROUP A: AN UNUSUAL CAUSATIVE PATHOGEN OF OTITIS EXTERNA

Otitis externa, a frequent condition encountered by otolaryngologists in practice, is an infection of the outer ear canal caused by various pathogens. Morganalle Morganii is a gram-negative, facultative aerobic bacilli found in the natural flora of gastrointestinal system, rarely causing infection alone and manifesting itself in people with depressed immunity, in hospital infections or super infections. It is commonly implicated in urinary tract infections and pyogenic infections but our literature review did not reveal any study indicating Morganalle morganii as the cause of otitis media. This paper reports an unusual case of otitis media caused by Morganella morganii.

**Keywords:** Acute otitis externa, Morganella morganii

## Introduction

Acute otitis externa (AOE), known also as 'swimmer's ear', is an inflammatory condition of ear canal, with or without infection and can be treated successfully with a course of eardrops [1].

Morganella morganii is a gram negative aerobe found often as intestinal commensal. It is commonly implicated in urinary tract infections and pyogenic infections, but rarely causes CNS infections especially brain abscess [2].

In this paper, we present an unusual case of otitis media caused by Morganella morganii.

## Case Report

A male patient at the age of 64 applied to our ENT polyclinic with complaints of fullness, pain and discharge in the ear, which he had been suffering since having a bath 20 days ago. History of the patient revealed that he had been

diagnosed with otitis media and undergone a medical treatment at another medical centre. The patient did not know the details of the treatment. Auto-microscopic examination of the patient showed severe edema in both of his outer ear canals (OEC) along with presence of granulation tissues and purulent discharge. After obtaining samples from the purulent discharge for culture and antibiogram, the discharges in both ear canals were aspirated. Tympanic membranes could not be evaluated due to edema in outer ear canal. Other E.N.T examination did not show any other pathology.

History of the patient revealed also that the patient had been followed-up with a diagnosis of diabetes mellitus (DM) for 15 years and used Lantus® OptiPen® 100 U / ml 1x30 units and APIDRA 100 U/ML (Sanofi Aventis) 3x12 unit. Laboratory evaluation during his admission showed that his fasting blood glucose was 199 mg/dl while the other blood parameters were normal.

The patient was suggested to be treated as an in-patient as he had DM and a history of resistance to medical treatment. Topical ciprofloxacin (Siprogut %0.3 5 ML Ear Drop Bilim Drug Industry Turkey) and dexamethasone (Dexamethasone 0.1% 5 ML Eye/Ear Drop I.E. Ulugay Drug Industry Turkey) eardrops were started, and both of his outer ear canals were cleaned by local treatment every morning and evening. However, seeing that there was no improvement despite topical medical and local treatment for 48 hours, the local treatment was ended considering a reactive external otitis due to the drops used. After observing an improvement in the edema in the outer ear canal during the following 24 hours, only ear aspiration was performed on a daily basis until the culture results were obtained.

When the culture results revealed growth of *Morganella Morganii*, a treatment was initiated with piperacillin/tazobactam (Tazoject 4.5 G IV, Tum Ekip Ilac AS) 3x4,5 g/dl-day based on the antibiogram performed by the infectious diseases service. On the third day of the medical treatment, symptoms of the patient improved, auto-microscopy showed no discharge, granulation tissues improved and eardrums were intact. After continuing the treatment for 14 days, the patient was discharged with healing. The follow-up on the 3<sup>rd</sup> month showed that both outer ear canals were normal.

## Discussion

Acute otitis externa is an inflammation of the ear canal with or without infection and may manifest itself as ear discomfort, itchiness, discharge and impaired hearing. Otitis externa, which is also called 'swimmer's ear', can usually be treated successfully with ear drops [1]. Many factors such as diabetes, pre-existing dermatitis, bacterial colonisation, exposure to external factors (swimming, trauma, foreign body in the ear, using a hearing aid), and previous infections may cause otitis externa [3, 4].

*Pseudomonas aeruginosa* and *Staphylococcus aureus* are the most important pathogens occurring as a polymicrobial infection. Others, any one of which cause up to a 2% to 3% of all the cases in large clinical series are the gram-negative organisms other than *P. aeruginosa*. Fungal involvement, which is distinctly uncommon in primary AOE, may be more common in chronic otitis externa or when AOE is treated with topical antibiotics, or, less often, systemic antibiotics [5-7].

For seven to ten days, topical antibiotics with or without topical steroids are effective in mild-to-moderate AOE while systemic antibiotics that cover *S. aureus* and *P. aeruginosa* should be used in more severe cases [1, 4 and 8].

While *M. morganii* was earlier designated as *Proteus morganii*, now it is included as a separate genus in the Enterobacteriaceae with one species *morganii*. Recent studies on DNA-DNA hybridization have revealed existence

of two subspecies: *M. morganii* subspecies *morganii*, with four biogroups and subspecies *sibonii* with three biogroups [9].

Soil, water and fecal flora are the contaminating sources for *Morganella morganii*, which is a well-known cause of urinary tract infection, wound infection, sepsis, and other extra intestinal infections. It is commonly a part of polymicrobial infection and can rarely cause fatalities in debilitated patients [2, 10]. Known to be an opportunist pathogen, *Morganella morganii* has been known to occur both community and nosocomial infections

The organism is usually susceptible to quinolones such as nalidixic acid, ciprofloxacin, aminoglycosides, such as, Gentamicin, Amikacin, Tobramycin, Chloramphenicol, Cotrimoxazole, Aztreonam, and other Carbapenems and that are resistant to Penicillins and many Cephalosporins [9].

Other than a study published by Patil et al. [2] in 2012 and where the authors stated that *Morganella morganii* can have an otogenic origin in cases with brain abscess caused by this pathogen, our literature did not yield any otitis externa case caused by *Morganella morganii*. To our knowledge, our case is the first case where otitis media is caused by *Morganella morganii*. As a result, we wanted to present our case to draw attention to the fact that different pathogens such as *Morganella morganii* can sometimes, although rare, be the causative pathogens when there is no clinical response to topical antimicrobial treatment in old and immunosuppressive patients like our case.

## References

1. Kaushik V, Malik T, Saeed SR. Interventions for acute otitis externa. *Cochrane Database Syst Rev.* 2010; 20; (1): CD004740. doi: 10.1002/14651858.CD004740.pub2. Review. PubMed PMID: 20091565.
2. Patil AB, Nadagir SD, Lakshminarayana S, Syeda FM. *Morganella morganii*, subspecies *morganii*, biogroup A: An unusual causative pathogen of brain abscess. *J Neurosci Rural Pract.* 2012; 3(3): 370-2. doi: 10.4103/0976-3147.102631. PubMed PMID: 23189003; PubMed Central PMCID: PMC3505342.
3. Nogueira J, Melo Diniz F, Lima E, Lima Z. Identification and antimicrobial susceptibility of acute external otitis microorganisms. *Rev Bras Otorrinolaringol* 2008; 74(4): 526–30.
4. Hui CP; Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Acute otitis externa. *Paediatr Child Health.* 2013; 18(2): 96-101. English, French. PubMed PMID: 24421666; PubMed Central PMCID: PMC3567906.
5. Roland PS, Stroman DW. Microbiology of acute otitis externa. *Laryngoscope* 2002; 112(7): 1166-77.
6. Martin TJ, Kerschner JE, Flanary VA. Fungal causes of otitis externa and tympanostomy tube otorrhea. *Int J Pediatr Otorhinolaryngol* 2005; 69(11): 1503-8.
7. Rosenfeld RM, Schwartz SR, Cannon CR, Roland PS, Simon GR, Kumar KA, Huang WW, Haskell HW, Robertson PJ. Clinical practice guideline: acute otitis externa. *Otolaryngol Head Neck Surg.* 2014; 150(1):1-24. doi: 10.1177/0194599813517083. Review. Erratum in: *Otolaryngol Head Neck Surg.* 2014; 150(3): 504. PubMed PMID: 24491310.
8. Rosenfeld RM, Brown L, American Academy of Otolaryngology – Head and Neck Surgery Foundation et al. Clinical practice guideline: Acute otitis externa. *Otolaryngol Head Neck Surg.* 2006; 134(4): 4–23.
9. Colier L, Balows A, Sussman M, Brian ID, editors. Topley and Wilson's, Microbiology and Microbial infections, Systematic Bacteriology. 9th ed. London: Arnold Press; 1998. Chapter in a book: B. W Senior. *Proteus. Morganella and Providencia.* 1044–6.
10. Chuang YC, Chang W, Huang CR, Chen H. *Morganella morganii* Central Nervous System Infection: Case Report and review. *Infect Dis Clin Pract.* 1998; 8: 50–2.

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