

***Corynebacterium striatum*: An Unusual Pathogen of Nosocomial Meningitis**

***Corynebacterium striatum*: Nozokomiyal Menenjitte Nadir Bir Patojen**

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SUMMARY

A 55-year-old woman was admitted due to subarachnoidal hemorrhage, and external ventricular drainage catheter was inserted. Two days after the procedure, carbapenem-resistant *Acinetobacter baumannii* meningitis developed. After 10 days of treatment with intravenous tigecycline (200 mg/day) and intrathecal netilmicin (9 mg/day), colistin was obtained, and the antimicrobial therapy was changed to intravenous and intrathecal colistin, together with intrathecal netilmicin; tigecycline was stopped. Cerebrospinal fluid sterility could not be achieved under this therapy, and after repeated manipulation of the external ventricular drainage catheter, *Corynebacterium striatum* was isolated from two cultures of cerebrospinal fluid, which were performed on consecutive days. Vancomycin (2 g/day) and intrathecal gentamicin (8 mg/day) were initiated; however, the patient died on the second day of this therapy.

Key Words: *Corynebacterium striatum*, Meningitis, Drainage

ÖZET

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Elli beş yaşındaki kadın hasta subaraknoidal kanama nedeniyle acil servise başvurdu. Hastaya eksternal ventriküler drenaj takıldı. İki gün sonra hastada *Acinetobacter baumannii* menenjitisi gelişti. Kolistin temin edilemediği için intravenöz tigesiklin (200 mg/gün) ve intratekal netilmisin (9 mg/gün) verildi. Kolistin 10 gün sonra başlanabildi. Kolistin intravenöz (240 mg/gün) ve intratekal (10 mg/gün) olarak, intratekal netilmisin ile birlikte verildi ve tigesiklin kesildi. Eksternal ventriküler drenajdan tekrarlayan işlemler sonrası, hastada *Corynebacterium striatum* menenjitisi gelişti. Vankomisin (2 g/gün) ve intratekal gentamisin (8 mg/gün) tedavisi başlandı. Ancak hasta bu tedavinin ikinci günü kaybedildi.

Anahtar Kelimeler: *Corynebacterium striatum*, Menenjit, Eksternal ventriküler drenaj

INTRODUCTION

Corynebacterium striatum is non-motile, non-spore forming, catalase-positive and gram-positive aerobic rod. The organism is known as saprophytic cutaneous bacterium and it is generally regarded as a contaminant when isolated from cultures. It rarely causes human infections^[1]. In this report, we present a patient with nosocomial *C. striatum* meningitis associated with external ventricular drainage (EVD) catheter.

CASE REPORT

A 55-year-old woman was admitted to the hospital with headache, nausea and unconsciousness. EVD catheter was inserted in emergency service on the day of admission because of subarachnoidal hemorrhage and she was followed up in the neurosurgical intensive care unit. Two days later, she developed fever and mental and motor disorientation. Cerebrospinal fluid (CSF) analysis revealed pleocytosis [white blood cell (WBC) count $90/\text{mm}^3$ with polymorphonucleocytes predominance], $50/\text{mm}^3$ red blood cells (RBC)s, and glucose 102 mg/dL (blood glucose 125 mg/dL), with a total protein of 180 mg/dL. On CSF Gram stain, gram-negative bacilli were seen, and vancomycin (2 g/day) and meropenem (3 g/day) were started. CSF culture grew multi-drug-resistant (susceptible to only colistin, tigecycline and netilmicin) *Acinetobacter baumannii*. Vancomycin and meropenem were stopped. Colistin was not available, so intravenous tigecycline (200 mg/day) and intrathecal netilmicin (9 mg/day) were administered. Colistin was later obtained and started after 10 days. Intravenous (240 mg/day) and intrathecal (10 mg/day) colistin were administered together with intrathecal netilmicin, and tigecycline was stopped. Du-

ring these 10 days, repeated CSF analysis was performed. In these analyses, WBC counts and CSF protein (290 mg/dL) increased and CSF glucose (30 mg/dL; blood glucose 134 mg/dL) decreased. Furthermore, CSF sterility could not be achieved and repeat cultures yielded *A. baumannii*. After the fourth day of colistin therapy, *Corynebacterium* spp. were cultured from repeated CSF analysis, and CSF protein was increased (301 mg/dL) and glucose (5 mg/dL; blood glucose 116 mg/dL) decreased. Phylogenetic analysis of the isolate by 16S rRNA revealed the strain as *C. striatum*. Neighbor-joining phylogenetic tree of the strain within the radiation of species of the genus *Corynebacterium* is shown in Figure 1. Vancomycin and intrathecal gentamicin (8 mg/day) therapy were begun; however, the patient died on the second day of therapy.

DISCUSSION

EVD is frequently necessary in neurosurgical intensive care unit patients. However, meningitis and ventriculitis are serious complications of this procedure. The etiology of nosocomial meningitis most frequently arises from skin flora, and *Staphylococcus epidermidis* and *Staphylococcus aureus* account for 80% of the cases of nosocomial meningitis and ventriculitis. However, widespread use of antibiotics and hospital flora may have altered the epidemiology of post-neurosurgical meningitis^[2]. Most nosocomial infections in our intensive care units were associated with multi-drug resistant *Acinetobacter* spp., and 83% of cases of nosocomial gram-negative meningitis were associated with multi-drug resistant *Acinetobacter* spp.^[3,4]. Also, in this case, *A. baumannii* was the cause of the first meningitis episode. However, extended duration, frequent manipulation, leaks, and

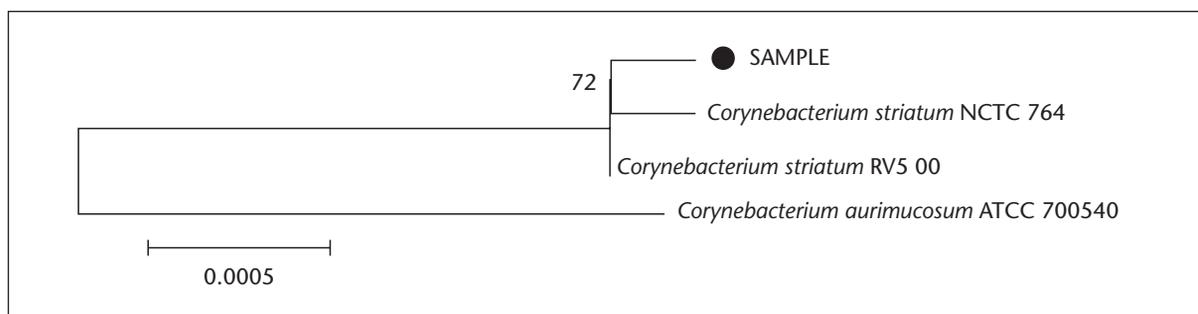


Figure 1. Neighbor-joining phylogenetic tree showing the position of the strain within the radiation of species of the genus *Corynebacterium*.

irrigation of the catheter increase the risk of repeated episodes and vary the etiology of meningitis. In patients with foreign bodies and frequent manipulation, cutaneous organisms such as coagulase-negative staphylococci or *Corynebacterium* spp. may cause severe infections like meningitis^[2]. However, these organisms may be disregarded by clinicians and accepted as contaminants. *C. striatum* was the cause of the second meningitis episode in this case. This is the first case of *C. striatum* meningitis in our intensive care unit, and we initiated therapy after repeated positive CSF cultures. There are only a few case reports about human infections caused by this microorganism. *C. striatum* has been mainly associated with infective endocarditis, and there is only one case of nosocomial meningitis in the English literature^[1,5]. Immunosuppression and indwelling foreign materials (central venous catheter, peritoneal dialysis catheter, prosthetic valve, etc.) are risk factors for *C. striatum* infection, as for all skin flora elements. Vancomycin was the therapeutic agent most frequently used in the management^[2]. Removal of the catheter should be considered in therapeutic failure and recurrent infections.

In conclusion, clinicians should be aware of *C. striatum*, an unusual cause of nosocomial meningitis, especially in immunocompromised patients and patients with indwelling catheter. Repeated isolation of the microorganism from sterile body fluids must alert clinicians to the possible diagnosis of invasive disease.

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