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Case Report **Clinical Bacteriology**

Infective Endocarditis Caused by *Corynebacterium argentoratense:* An Emerging Germ

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Abstract

Species of Corynebacterium are Gram-positive bacilli, often considered contaminants, but some non-diphtheritic species are now recognized as opportunistic pathogens. We report a case of infective endocarditis caused by *Corynebacterium argentoratense*, an extremely rare species, in a 59-year-old patient with a history of severe pneumonia. This case highlights the potential emergence of this species in severe human infections and the importance of cautious interpretation of positive blood cultures involving corynebacteria.

Keywords: *Corynebacterium argentoratense*, infective endocarditis, Gram-positive bacilli, emerging species, blood culture, mitral valve.

INTRODUCTION

Corynebacterium species are aerobic or facultatively anaerobic Gram-positive bacilli, widely distributed in the environment and part of normal skin and mucosal flora [1]. While *Corynebacterium diphtheriae* is well known for its pathogenicity, several non-diphtheritic ("diphtheroid") species were long considered mere contaminants. However, recent studies have shown their involvement in various opportunistic infections, particularly in immunocompromised patients, those with implanted medical devices, or following invasive procedures [2]. Among these, *Corynebacterium argentoratense* is especially rare. First described in Strasbourg in 1995 [3], it remains seldom implicated in human infections. Infective endocarditis (IE) caused by this species has only been reported in a few exceptional cases [4]. We present a case of mitral valve IE due to *C. argentoratense*, illustrating the pathogenic potential of this typically overlooked organism.

CASE REPORT

A 59-year-old male with a recent history of Intensive Care Unit (ICU) admission for severe pneumonia requiring mechanical ventilation (1 month duration) and a 90 pack-year smoking history was admitted for febrile respiratory distress. He was febrile, tachypneic, and in shock, requiring vasopressor support. Cardiac examination revealed a systolic murmur at the mitral focus. Transthoracic echocardiography revealed large vegetations on the atrial side of the mitral valve, with leaflet perforations causing severe mitral regurgitation. Blood tests showed leukocytosis (24 G/L) and elevated CRP (137 mg/L). Three sets of blood cultures were taken, and empiric antibiotics with cefepime and amikacin were started. All cultures grew *Corynebacterium*.

On ICU day 4, the patient underwent mitral valve replacement with a mechanical prosthesis. Direct microscopic examination of the removed valve showed numerous Gram-positive bacilli. Cultures on blood and chocolate agar (aerobic, 37°C, 18-24 h) and Schaedler

agar with nalidixic acid-colistin (anaerobic, 48 h) yielded dry colonies after 24 h (figure 1). Gram staining confirmed coryneform Gram-positive bacilli. API 20 CORYNE identification revealed *C. argentoratense* with 98% certainty.

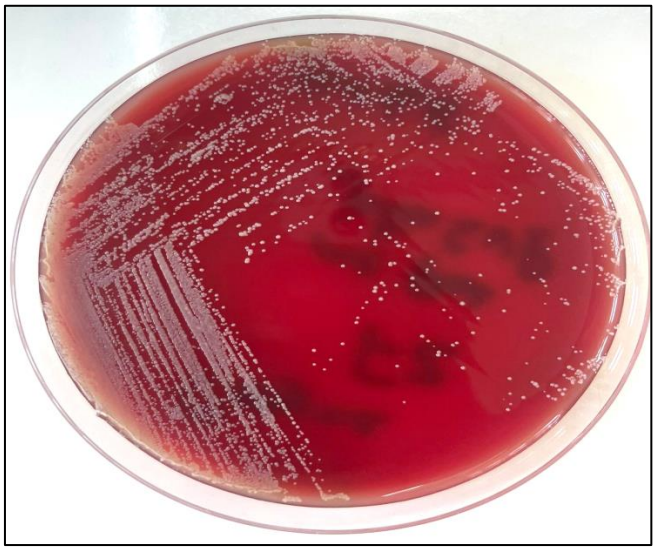

Figure 1: Colonies of *Corynebacterium argentoratense* blood agar

Antibiotic susceptibility testing showed sensitivity to vancomycin, rifampicin, and linezolid, and resistance to penicillin G, ciprofloxacin, tetracycline, and trimethoprim-sulfamethoxazole. The patient was treated with vancomycin, imipenem, and gentamicin. He was extubated on postoperative day 5 with initial improvement.

However, on day 7, he developed nosocomial pneumonia requiring reintubation, followed by two episodes of pneumothorax, both drained. On postoperative day 41, he developed septic shock with multi-organ failure and died.

DISCUSSION

Isolation of *Corynebacterium* in blood cultures is often dismissed as skin contamination, particularly for non-diphtheritic species. However, in cases with multiple positive blood cultures, echocardiographic evidence, and histopathological concordance, their pathogenicity must be considered. In our case, *C. argentoratense* was repeatedly isolated from blood cultures and confirmed by valve culture and direct examination, in the context of native mitral valve IE.

Corynebacterium species are responsible approximately 0.2-0.4% of native valve endocarditis and up to 9% of early prosthetic valve endocarditis cases [5,6]. Previously viewed as low-virulence organisms, species like *C. jeikeium*, *C. striatum*, *C. amycolatum*, and *C. urealyticum* have caused severe infections, particularly in immunocompromised hosts or those with prosthetic devices [7,8]. These species form biofilms on inert surfaces, a key mechanism in IE pathogenesis [9].

C. argentoratense, first described in 1995 in Strasbourg from pharyngeal samples of healthy individuals [10], has since been rarely implicated in invasive infections only one confirmed case of IE, a few bacteremias, and a case of meningitis have been reported [11-13]. In our case, the patient's complex medical background likely facilitated bloodstream translocation and subsequent valvular infection by this opportunistic pathogen.

Identification via API 20 CORYNE remains common but is increasingly being replaced by MALDI-TOF mass spectrometry, which offers faster and more accurate identification, even for rare species [14]. Diagnosis was strengthened by direct Gram staining and cultures of the excised mitral valve.

The resistance profile resistance to penicillin, ciprofloxacin, tetracycline, and trimethoprim-sulfamethoxazole, but sensitivity to vancomycin, rifampicin, and linezolid is consistent with previously reported *Corynebacterium* infections [7,15]. Triple therapy led to early clinical improvement, but fatal nosocomial complications ensued, unrelated to the initial endocarditis.

CONCLUSION

This rare case of infective endocarditis caused by *Corynebacterium argentoratense* underscores the emerging clinical significance of this species in severe infections. It emphasizes the need to recognize *Corynebacterium* species as true pathogens in the appropriate clinical context, especially when repeatedly isolated. Accurate species identification and careful interpretation of blood cultures are essential to avoid

underestimating these so-called « minor » pathogens and to guide appropriate therapy.

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