

CASE REPORT

CUTANEOUS INFECTION CAUSED BY *Corynebacterium pseudodiphtheriticum*. A MICROBIOLOGICAL REPORT

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SUMMARY

We report here a rare case of cutaneous infection due to *Corynebacterium pseudodiphtheriticum*. The patient presented to the clinical laboratory with a skin ulcer on his left leg. Gram-stained preparation of the purulent secretion revealed the presence of numerous rod-shaped Gram-positive organisms in the absence of any other species. The organism was grown in pure culture on sheep blood agar and was further identified as *C. pseudodiphtheriticum* using a commercial identification system (API-Coryne, BioMérieux, France). The infection was successfully treated with ciprofloxacin. This case emphasizes the importance of the clinical microbiology laboratory in correctly identifying Gram-positive organisms obtained in pure culture from skin ulcers.

KEYWORDS: *Corynebacterium pseudodiphtheriticum*; Cutaneous infection; Skin ulcer; Skin pathogens.

INTRODUCTION

The isolation of corynebacteria from clinical samples usually represents contamination with the patient endogenous flora. *Corynebacterium pseudodiphtheriticum* (previously known as *Corynebacterium hofmannii*) is found as part of the normal flora of the upper respiratory tract, however, it is also recognized as a respiratory tract pathogen¹ in both immunocompetent and immunocompromised patients³. Other infections caused by this organism include keratitis and conjunctivitis⁵, and endocarditis⁶. *C. pseudodiphtheriticum* was also reported to cause an ulcerating lesion on the hand of a patient⁴ suggesting that this organism is a potential skin pathogen. In our laboratory, we have isolated *C. pseudodiphtheriticum* in other occasions, mainly from samples of patients with lower respiratory tract infections, however, this was the first isolation of this species from a skin ulcer.

CASE REPORT

We describe here the isolation of *C. pseudodiphtheriticum* from a skin ulcer on the left thigh of an immunocompetent, previously well, male patient. The patient presented to his physician with an ulcerated, purulent lesion on the upper part of his left leg. The source of the infection remains unknown. Upon clinical examination, he was referred to our laboratory to perform direct examination (Gram staining) and culture of the clinical sample.

After cleaning the external surface of the wound, a swab was used to

collect the purulent material from the deeper part of the ulcer. Gram staining revealed numerous polymorphonuclear cells and Gram-positive rods only. Culture was performed using commercially available sheep blood agar and chocolate agar plates (BioMérieux, RJ, Brazil), and pure colonies were observed after 24h of incubation at 35 °C, under aerobic conditions. A Gram staining of the whitish colonies from the sheep blood agar plate confirmed the presence of Gram-positive rods. The catalase reaction was positive. Identification at species level was accomplished by using the API-Coryne strips (BioMérieux, France), whose code number (3001004) corresponded to that of *C. pseudodiphtheriticum*, and the identification was remarked as excellent. The organism was able to reduce nitrates, produced pyrazinamidase, and was strongly positive for urease production. It was unable to ferment any of the carbohydrates tested (glucose, ribose, xylose, mannitol, maltose, lactose, saccharose, glycogen), which is expected for this organism. Since no standardized breakpoints exist for corynebacteria, a susceptibility test was done by inoculating a 0.5 MacFarland suspension of the organism onto a Mueller-Hinton agar supplemented with 5% sheep blood, and incubation for 24h in ambient air as above. Our strain showed marked resistance to clindamycin and erythromycin, but was fully susceptible to gentamicin, trimethoprim-sulfamethoxazole, penicillin, vancomycin, and ciprofloxacin, by disk diffusion, using the interpretation criteria for *Staphylococcus* spp. recommended by the National Committee for Clinical Laboratories Standards (NCCLS Document M100-S13). The patient was treated with ciprofloxacin per oral route or per os b.i.d. with good response to this drug, and ulceration completely disappeared two weeks after the starting of the treatment.

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DISCUSSION

Identification of corynebacteria isolated from skin lesion is warranted, specially when it is present as the only organisms seen in Gram stain preparation and pure growth of Gram-positive rods is obtained. It is noteworthy that other corynebacteria, such as *C. diphtheriae* and *C. ulcerans*, are also capable of causing cutaneous ulcers², and these species should not be missed as indigenous flora. The association of *C. pseudodiphtheriticum* and skin ulcer has been proposed recently⁴. Since *C. pseudodiphtheriticum* is able to hydrolyze urea, a rapid urease test would be useful to suggest its presence, however, full identification can be achieved by using the API-Coryne strips, with the additional benefit of identifying other potentially pathogenic corynebacteria species⁷.

GUTIERREZ-RODERO *et al.*³ noted that macrolide resistance was common among *C. pseudodiphtheriticum* strains isolated from HIV-positive patients. According to HEMSLEY *et al.*⁴, their patient responded to cefuroxime followed by oral clindamycin, with complete healing and minimal scarring. Interestingly, in our case, the isolate was totally resistant to macrolides. These results suggest that the susceptibility pattern of this organism is variable and is not predictable in every case. Ideally, for corynebacteria, susceptibilities should be performed by an MIC dilution technique, however, this method is cumbersome, technically demanding, and not available in every clinical microbiology laboratory. Although guidelines for the susceptibility testing using disk diffusion for corynebacteria is currently unavailable, susceptibility test may be considered to guide the selection of appropriated antimicrobial agents. In the absence of validated interpretative standards for corynebacteria, some workers have used the standards published for the staphylococci, specially for predicting penicillin susceptibility², while others recommend the use of the criteria published for the streptococci⁸.

In summary, to the best of our knowledge, this is the second report of skin ulcer caused by *C. pseudodiphtheriticum* and our case report corroborates the findings of HEMSLEY *et al.*⁴ that *C. pseudodiphtheriticum* should be considered a potential skin pathogen. We also emphasize the importance of correct identification of corynebacteria when present in pure culture, otherwise truly pathogenic species could be disregarded as contaminants.

RESUMO

Infecção cutânea causada por *Corynebacterium pseudodiphtheriticum*. Relato microbiológico

Reportamos o isolamento de *Corynebacterium pseudodiphtheriticum* de um caso de infecção cutânea. O paciente apresentou-se ao laboratório clínico com uma úlcera na perna esquerda. A coloração de Gram do material revelou a presença de bacilos Gram-positivos e ausência de outras espécies bacterianas. O organismo foi isolado em cultura pura no ágar sangue de carneiro e foi identificado como *C. pseudodiphtheriticum* através de um sistema de identificação comercial (API-Coryne, BioMérieux, França). A infecção foi tratada com sucesso através do uso de ciprofloxacina. Este caso reforça a importância do laboratório de microbiologia clínica na identificação de organismos Gram-positivos isolados de cultura pura de amostras de úlceras cutâneas.

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