



CORRESPONDENCE

Bacillus licheniformis as a cause of a deep skin abscess in a 5-year-old girl: An exceptional case following a plant thorn injury



Dear Editor,

Bacillus spp. remain a rare cause of infection and, when this occurs, diagnosis is difficult to establish. *Bacillus licheniformis* infections have been described mainly in immunocompromised patients.

We report an exceptional case of a *B. licheniformis* deep skin abscess related to a retained plant thorn in an immunologically competent patient.

A 5-year-old female was admitted to our hospital with inflammatory signs on her left foot (Fig. 1A). One week earlier, she had suffered a penetrating injury with several plant thorns that were removed from the superficial skin for which she received empirical treatment with amoxicillin–clavulanic acid. Nonetheless, she noticed a worsening of symptoms, with suppurative changes. On admission, blood analyses and the C-reactive protein were normal. Radiography was unremarkable (Fig. 1C) and a magnetic resonance imaging (MRI) scan revealed an abscess associated with a 4-cm foreign body deeply embedded between the fourth and fifth toes of the left foot (Fig. 1D). Blood cultures were obtained and the patient underwent surgical examination. During the surgery, a 4-cm plant thorn was removed (Fig. 1B) and the abscess was drained. Urgent Gram stain revealed Gram-positive bacilli (Fig. 1E) and an abscess and thorn cultures showed definitive identification of *B. licheniformis* 72 hours after admission (Fig. 1F). The antibiogram showed susceptibility to doxycycline, levofloxacin, vancomycin, and trimethoprim–sulfamethoxazole; and resistance to penicillin, amoxicillin, and clindamycin. On the basis of susceptibilities, a 10-day course of cotrimoxazole was prescribed and a successful response to the treatment was noted.

B. licheniformis has not been reported to invade mucosal barriers of the body without previous injuries. In immunocompetent individuals there is usually a history of

direct inoculation, either through injury or through a medical procedure such as a placement of a central venous catheter or a prosthetic valve.¹

Only two previous cases of *B. licheniformis* infection related to plant thorn injury in immunocompetent patients have been reported. Jones et al² described the case of a 41-year-old male with a central nervous system abscess due to a fragment of wood and Ameer et al³ reported a cutaneous infection due to a wicker splinter in a 50-year-old female. This is the first immunocompetent pediatric case to be reported.

These plant remains are not observable on plain radiographs and a computed tomography scan is likely to be misinterpreted. Among the imaging options available, MRI provides a very sensitive tool with a high negative predictive value for the detection of acute osteomyelitis.⁴

In this case, the identification of Gram-positive bacilli in an urgent Gram stain and subsequent isolation of *B. licheniformis* in two separate cultures (thorn and abscess specimen) proved the infection and ruled out a contamination of the specimens.

B. licheniformis produces a glutamate polymer, which is responsible for the mucous aspect of the colonies and the formation of a biofilm.² Antibiotic resistance is explained because of the biofilm and β -lactamase (penicillinase) production. In 1988 Weber et al⁵ tested antibiotic susceptibility for the *Bacillus* spp. with most noncereus isolates being sensitive to cotrimoxazole.⁵

In conclusion, this case emphasizes the potential role of *B. licheniformis* as a pathogen in immunocompetent hosts. The diagnosis is difficult to establish and MRI is the best imaging technique for the detection of plant foreign bodies. The urgent Gram stain proved to be one of the most helpful tools to guide empirical treatment and the combination of adequate antimicrobial therapy plus surgical

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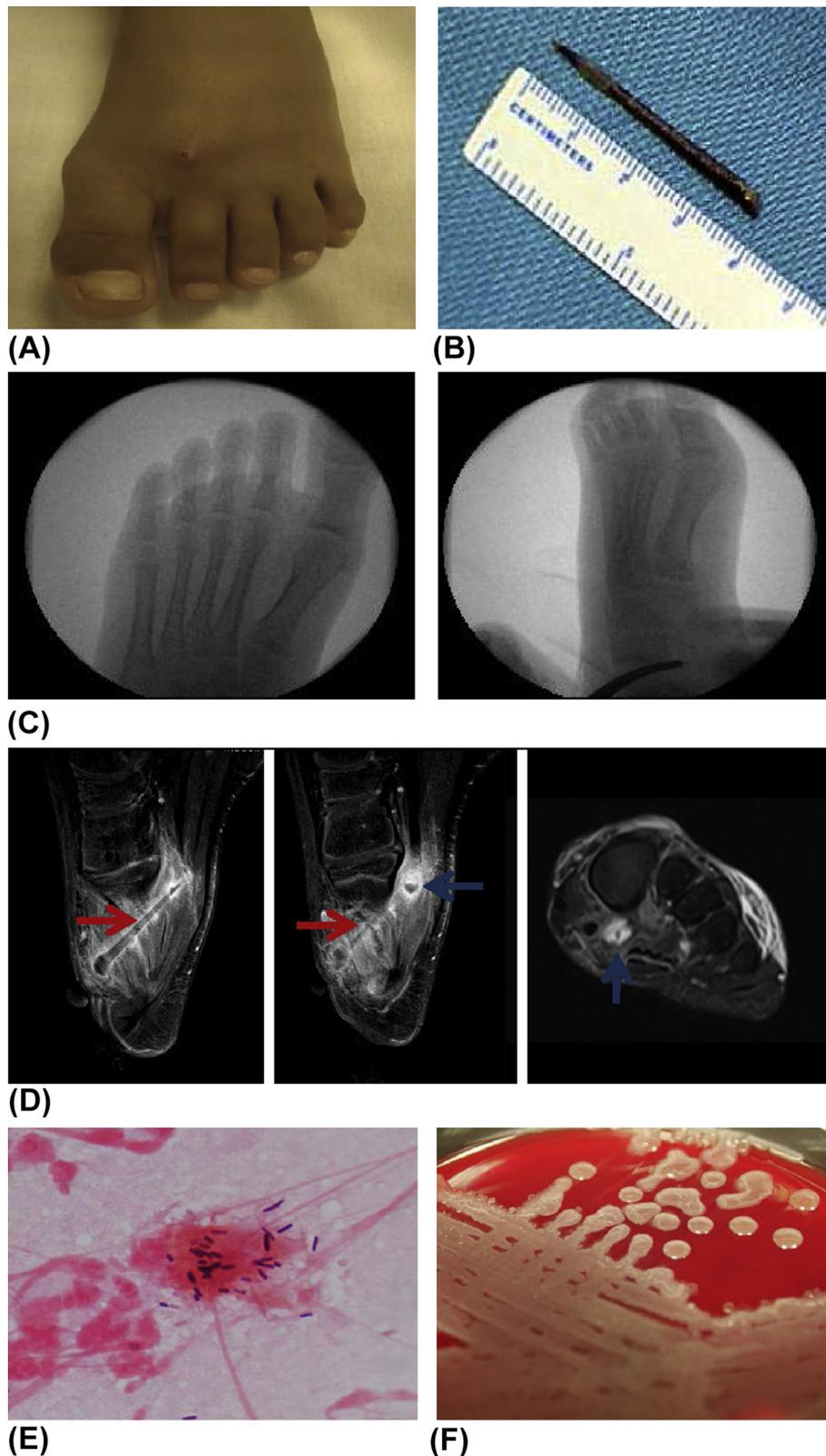


Figure 1. (A) Presentation of the patient after arriving at the emergency department with local inflammatory signs surrounding the lesion. (B) A 4-cm plant thorn removed during surgery. (C) Radiography: the foreign body was not detected. (D) Magnetic resonance imaging shows a 4-cm foreign body embedded deeply between the 4th and 5th toes of the left foot (red arrows) and an abscess (blue arrows). (E) Gram stain of *Bacillus licheniformis*: straight rods, Gram-positive, endospore-forming bacteria. (F) Mucilaginous colonies of *B. licheniformis* growing in Columbia agar with 5% sheep blood. They usually have a very strong adhesion to agar that resembles lichen.

drainage and removal of foreign bodies must be the treatments of choice.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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