

A Case of Cutaneous Protothecosis in an Immunocompetent Patient

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Dear Editor:

Protothecosis is a rare infection, caused by the genus *Prototheca*, achlorophyllous algae which are saprophytes in soil, and occasionally affect dogs and cats¹. It is believed that they may infect humans by traumatic inoculation².

A 74-year-old woman visited our clinic with prickling erythematous umbilicated papules on the anterior neck and upper chest which developed 2 months prior on top of an erythematous telangiectatic patch which had been present for 2 years (Fig. 1A, B). She had been treated at another clinic with topical corticosteroids for 2 years for suspected eczema aggravated by rubbing. She had no history of trauma or other medical disease. She had lived with a pet dog for 18 years.

The patient's complete blood count, renal and liver function, and chest X-ray study were all normal. The HBs Ag,

HCV Ab, HIV Ab, and anti-nuclear Ab tests were negative. The venereal disease research laboratory test (VDRL) was nonreactive. The histopathology revealed a granulomatous inflammation with necrosis in the dermis (Fig. 2A), containing many non-budding spherical organisms. Multiple sporangia containing endospores were observed with the morula appearance that is the characteristic feature of the *Prototheca* species (Fig. 2B). The Periodic acid-Schiff staining was positive and showed characteristic internal septation and thick cell walls (Fig. 2C). Treatment with oral itraconazole (200 mg/day) and topical sertaconazole for 12 weeks resulted in marked improvement of the skin lesions (Fig. 1C).

Cutaneous protothecosis mainly involves the extremities and its presentation is variable². It can manifest as an erythematous plaque, or less commonly, in ulcerative or purulent forms³⁻⁵. Our patient presented with erythematous

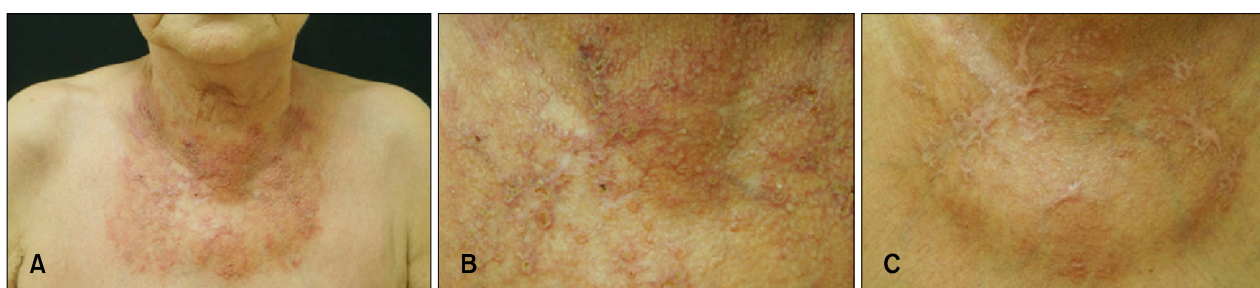


Fig. 1. (A) Several crusted papules on an erythematous telangiectatic patch on the anterior neck and upper chest. (B) Close-up view. (C) Improved skin lesion with fibrotic scar after treatment with oral itraconazole 200 mg/day and topical sertaconazole application for 3 months.

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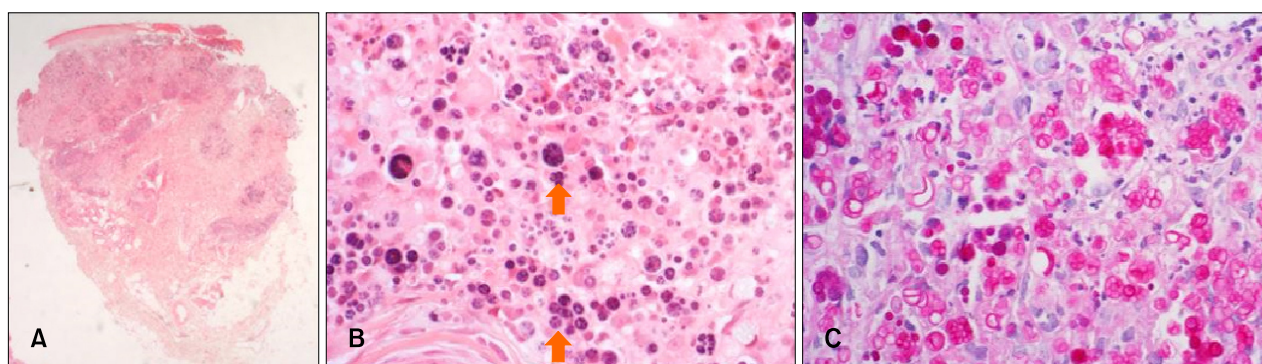


Fig. 2. (A) Granulomatous inflammation with necrosis in the dermis (H&E, $\times 12.5$). (B) Multiple sporangia with in morula-like or cartwheel-like appearance (arrow) (H&E, $\times 400$). (C) Multiple morula-like appearances highlighted by Periodic acid-Schiff stain ($\times 400$).

umbilicated papules on chest, which is a less common^{3,4}. *Prototheca* have low virulence; hence, systemic or local predisposing factors are commonly found in affected patients, such as steroid use, malignancy, diabetes mellitus, and organ transplantation³. Our patient had intact immunity but was predisposed to local immunosuppression by long-term topical steroid application, skin damage by frequent rubbing, and the presence of a pet dog, which may have been the source of the algae. *Prototheca wickerhamii* and *P.zopfii* can mainly cause human protothecosis, and *P.wickerhamii* is the most commonly responsible^{3,4}. The sporangia of *P.wickerhamii* are round with symmetrical morula formation and a diameter of $7 \sim 13 \mu\text{m}$, while the sporangia of *P.zopfii* are oval with relatively asymmetric random septation and a diameter of $14 \sim 16 \mu\text{m}$. *P.wickerhamii* is susceptible to antifungal agents and is easily treated, but *P.zopfii* is resistant to treatment.

In Korea, 11 cases of cutaneous protothecosis have been reported². Most of the reported cases involved patients who were over the age of 60 years. The most commonly involved sites were the extremities, except one patient whose cheek was affected. Most patients had systemic predisposing factors and 2 patients had local predisposing factors (long-term topical steroid use). All of these cases

were confirmed with diagnostic tests; *P.wickerhamii* was identified in 10 cases and *P. zopfii* was identified in 1 case².

We report a rare case of cutaneous protothecosis in an immunocompetent patient who presented with erythematous umbilicated papules on the chest after long-term topical corticosteroid use, traumatic rubbing, and exposure to a pet dog.

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