Unusual Chemical Burns Caused by Potentilla Argentea

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Abstract
Patients continue to seek traditional and alternative treatment modalities despite the advances in modern medicine. Such non-medical treatments remain controversial and can yield unexpected results. We report here on patients who had tightly wrapped the plant Potentilla argentea (Rosaceae) around their knees to treat rheumatism symptoms and consequently developed chemical burns. The plant bears 5-petalled yellow flowers that contain 2 polyphenols that inhibit DNA topoisomerases I and II and are thus cytotoxic. We hypothesize that this mechanism explains the chemical burns.

Keywords
chemical burns, alternative practices, Potentilla argentea

Introduction
Patients continue to seek traditional and alternative treatment modalities despite the advances in modern medicine. Such non-medical treatments remain controversial and can yield unexpected results. We report here on patients who had tightly wrapped the plant Potentilla argentea (Rosaceae) around their knees to treat rheumatism symptoms and consequently developed chemical burns. The plant bears 5-petalled yellow flowers that contain 2 polyphenols that inhibit DNA topoisomerases I and II and are thus cytotoxic. We hypothesize that this mechanism explains the chemical burns.

In this report, we describe 3 patients who developed chemical burns caused by plants they wrapped around their knees to treat arthralgia.

Case 1
A 57-year-old female was admitted to our clinic because of an open wound on her left prepatellar region. She had applied a plant paste recommended by a neighbor on her left knee and covered it with occlusive bandages. When the knee was unwrapped 12 hours later, she noticed a wound that remained open as she waited for it to recover. After 2 days, the wound had not recovered, and she was admitted to our clinic. We diagnosed bullous and erythematous lesions and hospitalized the patient (Figure 1). After application of daily dressings for 10 days, the wound became reepithelialized, and she was discharged.

Case 2
Two weeks prior to visiting us, a 65-year-old male macerated a plant with flowers (termed “spring flowers”) and wrapped the fragments around his knee for 12 hours to treat arthralgia. Pain increased, attributable to bullous and erythematous lesions at the application area. The patient visited another health care center but then came to us. On physical examination, an erythematous wound was evident on the left knee (Figure 2). The patient exhibited hypertension and impaired renal function and was thus closely monitored. His medical history revealed no renal disease. The comorbidities were treated, and he was discharged after regular changes of wound dressings allowed primary epithelialization to establish.

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Case 3

Ten days prior to his visit, a 48-year-old male patient macerated an unidentified plant recommended by his neighbors and wrapped the fragments around his knees to treat chronic pain. He unwrapped the bandage after 8 hours and recognized a bulla and redness. Examination revealed burns on the medial aspects of both knees (Figure 3). We prescribed regular changes of wound dressings, and he was discharged after reepithelialization of the burnt areas.

Discussion

Traditional treatments may have religious or cultural origins and are used to deal with pain, wounds, or skin lesions. Although their efficacy has not been proven, patients believe that the methods are effective. Plants are commonly used in traditional medicine. All 3 patients in the present study applied plant “poultices” (closed occlusive dressings) to their knees to treat arthralgia. The plant samples from the patients were identified as Potentilla argentea at the Science and Art Faculty Department of Botanics, Adiyaman University (Figure 4). Potentilla is a member of the family Rosaceae, subfamily Rosoideae, and is distributed principally in the temperate, arctic, and alpine zones of the Northern Hemisphere. The plant is widespread in North America, Europe, and Asia. The plant produces a 5-petalled yellow

Figure 1. The bullous and erythematous lesions on the patient’s left knee.

Figure 2. The erythematous wound on the patient’s left knee.

Figure 3. The bullous and erythematous lesions on both knees.

Figure 4. Potentilla argentea.
flower containing 2 polyphenols [kaempferol 3-O-beta-D-(6’’-E-p-coumaroyl)-glucopyranoside (tiliroside) and methyl brevifolin carboxylate] that inhibit DNA topoisomerases I and II and are thus cytotoxic. We hypothesize that this mechanism explains the chemical burns. Potentilla has been traditionally considered to be curative. In traditional Chinese medicine, Potentilla extracts have been used to treat diarrhea, hepatitis, rheumatism, and scabies; and for detoxification. In Tibetan traditional medicine, Potentilla extracts have been used to treat certain viral infections.

Although ranunculin has induced chemical burns in Turkey, there is no prior reported case of burns caused by Potentilla argentea. The burns experienced by our patients were probably caused by the occlusive wrapping of the macerated plant around the knee, which triggered long-term contact with cytotoxic agents.

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References
1. Tomczyk M, Latté KP. Potentilla—a review of its phytochemical and pharmacological profile. J Ethnopharmacol. 2009;122(2):184-204.
2. Tomczyk M, Drozdowska D, Bielawska A, Bielawski K, Gudej J. Human DNA topoisomerase inhibitors from Potentilla argentea and their cytotoxic effect against MCF-7. Pharmazie. 2008;63(5):389-393.
3. Xue PF, Yin T, Liang H, Zhao YY. Study on chemical constituents of Potentilla discolor. Chin Pharm J. 2005;40(14):1052-1054.
4. Zhao YL, Cai GM, Hong X, Shan L-M, Xiao X-H. Anti-hepatitis B virus activities of triterpenoid saponin compound from Potentilla anserine L. Phytomedicine. 2008;15(4):253-258.
5. Eskitascioglu T, Dogan F, Sahin G, Ozkose M, Coruh A, Ozyazgan I. An extraordinary chemical burn injury cause: buttercup; a report of five cases. Burns. 2008;34(5):727-730.