

case report

A rare chemical burn due to *Ranunculus arvensis*: three case reports

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Ranunculus arvensis, a plant that is a member of Ranunculaceae family, generally used for local treatment of joint pain, muscle pain, burns, lacerations, edema, abscess drainage, hemorrhoids, and warts among the population. In this case report, we presented three patients who developed chemical skin burns after using *R arvensis* plant locally for knee pain. The destructive effect of the plant has been reported previously to be more in fresh plants and less in dried plants. Although protoanemonin, which is considered as the main toxic substance, was reported to be absent in dried or boiled plants, the plant was boiled, cooled, and wrapped over the region with pain in our cases. Therefore, we thought that protoanemonin may be considered to be heat resistant. Also, the burn management proceeded up to surgery by using the flap technique in one of our patients in contrast to the cases found in published reports who were treated by antibiotics and dressings.

R*anunculus arvensis*, a member of the Ranunculaceae family, grows spontaneously in environments at altitudes between 1 and 1850 m, as an element of the vegetation.¹ In Turkey, this plant grows particularly in the Mediterranean, Eastern, and Southeastern Anatolia regions. It is generally used for the treatment of joint pain, muscle pain, burns, lacerations, edema, abscess drainage, hemorrhoids, and warts among the population.² However, this plant may cause skin inflammation and injury of mucous membranes as side effects. The destructive effect of the

plant has been reported to be more in fresh plants and less in dried plants.¹

In this case report, 3 patients who used *R arvensis* plant locally for pain after boiling, and who developed chemical skin burns thereafter are presented.

CASE 1

A 51-year-old female patient was admitted to the Emergency Department, Ataturk University, Erzurum, Turkey, with swelling and redness on her right leg. Her medical history revealed that she had boiled the flower



Figure 1. (a) Second-degree burn was present on her right leg; (b) flap treatment was used.

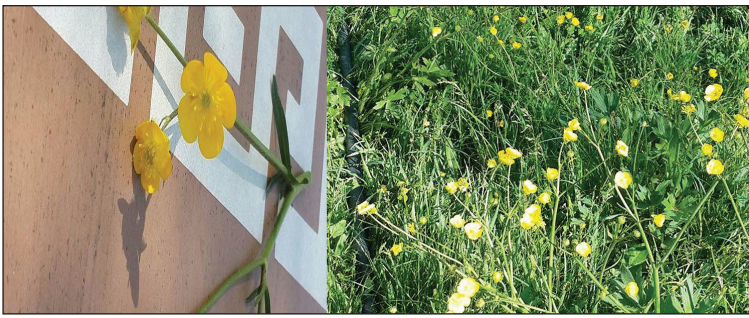


Figure 2. Plant used also confirmed as *Ranunculi arvensis*.



Figure 3. Swelling and redness developed after 5 hours.



Figure 4. Chemical burn 10 hours after wrap was opened.

named “wedding bloom” among the population and wrapped it around her knee for knee pain. After 12 hours, when she opened the wrap, she noticed red-

ness and swelling on her leg. Her vital signs during admission were within normal limits and second-degree burn was present on her right leg (**Figure 1a**). She was hospitalized in the burn unit of the hospital. During follow-up, since epithelization of the burn area was insufficient, flap treatment was used (**Figure 1b**). On her 16th day of admission, 80% healing was observed and she was discharged from the hospital. The plant that she used was photographed and was also confirmed as *R arvensis* (**Figure 2**) by the patient herself.

CASE 2

A 52-year-old female patient had boiled the same flower while it was fresh and applied it to her left knee for a period of 5 hours for her complaint of knee pain. After 5 hours, swelling and redness developed in her leg (**Figure 3**). Physical examination revealed a skin burn of 10×10 cm² in size, extending from the knee region down to her foot. The patient, whose vital signs were within normal limits, was admitted to the burn unit of the hospital. She was treated by changing her dressings daily. After 5 days, when her complaints regressed, she was discharged.

CASE 3

A 57-year-old female patient was admitted with complaints of pain, redness, and swelling on her right leg. She stated that she had boiled and then wrapped around her knee the flower known as a medicinal herb among the population. Ten hours later, when she opened the wrap, and the appearance was like the picture shown in **Figure 4**. She was diagnosed with chemical burn and was admitted to the burn unit of the hospital. She was followed up by changing her dressings daily, and when significant improvement was observed in the burn area, she was discharged from the hospital on her seventh day of admission.

DISCUSSION

Plants have been used since ancient times for medicinal purposes, and many side effects related to these plants have been reported.³ *R arvensis* is known as “wedding bloom” in Turkey. When the plant is fresh, all of its parts are considered as poisonous, and its destructive effect is enhanced. The severity of these effects is related to the size of the contact area, duration of contact, and amount of the plant used. The injury is generally manifested as chemical burn, with its development mechanism being related to irritancy, phototoxicity, and hypersensitivity reactions.⁴ Ranunculus species contain ranunculin. The ranunculin contained in ranunculus species is normally 10 mg/g of dry weight. Ranunculin

is the precursor of protoanemonin, which is a toxic substance and the actual toxic effect is considered to be caused by protoanemonin.⁵ Protoanemonin is a volatile and highly irritant oil, which increases the free oxygen radicals through inhibition of deoxyribonucleic acid polymerase.³ It contains extremely irritant lipids, such as saponins, hederagenin, and oleanolic acid glucosides, within its structure.^{1,3}

When applied on the skin surface, *R. arvensis* leads to bullae formation together with sub-epithelial detachment, through destruction of sulfur chains. Protoanemonin, which is considered as the main toxic substance, was reported to be absent in dried or boiled plants.¹ In 7 cases reported earlier, the plant was di-

rectly applied to the skin without any boiling process and then the skin was covered.^{1-4,6} However, in the cases discussed here, the plant was boiled, cooled, and wrapped over the region with pain. This situation is the first of its kind in the published reports.

In conclusion, the claim that the dried or boiled form of the *R. arvensis* plant is void of toxic protoanemonin is not true. Protoanemonin as it seems is heat-resistant and may lead to extensive chemical burn that may even require a skin flap.

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