

Dramatic Outcome of Traditional Treatment: Burn Injuries Developed Secondary to *Ranunculus Arvensis*

Tülin Öztaş¹, Ahmet Dursun², Salim Bilici³, Abidin Tüzün⁴

Author's Affiliation:

¹⁻³Department of Pediatric Surgery,
⁴Department of General Surgery,
Gazi Yaşargil Training and Research
Hospital, University of Health
sciences, Diyarbakır/Turkey.

Corresponding Author:

Tülin Öztaş, Department of Pediatric
Surgery, Gazi Yaşargil Training and
Research Hospital, University of
Health sciences, Diyarbakır/Turkey.
E-mail: tulinoztas@hotmail.com

Received on 19.05.2018,
Accepted on 09.06.2018

Abstract

The plant of *Ranunculus arvensis*, a member of Ranunculaceae family, has been used as a traditional method in order to treat a variety of diseases such as rheumatic pain, abscess drainage, burn injuries, wounds. In this study, *Ranunculus arvensis*-induced skin burns and their treatments were evaluated. *Methods*: The cases in whom burn injuries developed as a result of the use of *Ranunculus* plant which is administered in the traditional treatment for arthralgia, headaches with analgesia purpose were evaluated retrospectively. The patients' age, gender, application duration of the plant, site of lesions, treatment method administered, duration and results of treatment were examined. *Results*: Three of five cases were treated with a topical antibiotic and daily wound dressing as we applied in thermal burns. Additionally, partial thickness skin graft was placed in cases with deep burns. *Conclusion*: In conclusion, Thermal burn-like lesions may occur secondary to *Ranunculus arvensis*. As these lesions can be superficial, they may be deep enough to require surgical treatment. Standard burn injury treatment can be applied in these cases.

Keyword: Plant Burn; Chemical Burn Injury; *Ranunculus*.

Introduction

Despite advances in the modern medical science, alternative treatment methods are still very popular among population nowadays. In addition to a wide variety of herbal and chemical products sold in the herbalist, locally grown plants are used unconsciously with the suggestions of the prominent people of the region. Although these conventional treatments have been found to be beneficial and accepted in some regions, generally unconscious uses can cause very serious harm to the patient.

A wide variety of plants are used unconsciously in traditional treatment in our region as well. *Ranunculus arvensis*, one of these plants, is used for the treatment of the diseases such as abscesses, hemorrhoids, arthralgia, headache and common cold (Fig. 1). *Ranunculus arvensis*, a member of the ranunculus family, is popularly known with the names such as wedding flowers and mayflowers [1,2]. It grows especially in the

Mediterranean, Eastern and South-eastern regions of Turkey [3]. In this study, the cases in whom burn injuries developed in the knee and back of the neck upon application of *Ranunculus* plant for analgesic purposes were presented along with the literature.



Fig. 1: *Ranunculus Arvensis*

Table 1: Age, gender and clinical characteristics for cases of skin burns caused by plants of the *Ranunculus arvensis*.

Ref	Age	sex	Implementation period	Admission to hospital	Location	Approach to lesions	Healing time
Orak	64	M	12 h	Immediately	Left distal thigh	Debridement, topical nitrofurantoin	3wk
Sayhan	17	M	48 h	2 d	Back, scrotum, penis, chest	Wet dressing, silver sulfadiazine, collagenase	4 wk
Akbulut	48	M	1h	1 d	Right thumb	Dressing with fusidic acid	3 wk
	59	F	overnight	5 d	Bilateral knee	Clor hexidine scrub + silver sulfadiazine cream	2 wk
	70	F	2 d	immediately	Bilateral knee	Clor hexidine and Paraffin-impregnated gauze dressing	10 d
Albayrak	60	M	5 h	14 d	Left thigh on posterior	Clor hexidine and Paraffin-impregnated gauze dressing	11 d
Uçmak	42	M	12 h	immediately	Anterior surface of right	Wet dressing + topical antibacterial cream	1 mo
	60	M	10 h	2 d	Both lower extremities	Topical treatment	2 wk
Koçak	51	F	12 h	immediately	Right leg	Flap treatment	16 d
	52	F	5 h	immediately	Left knee	Dressings daily	5 d
	57	F	10 h	immediately	Right leg	Dressings daily	1 wk
Curent	10	F	12 h	10 d	Posterior of neck	Dressing with fusidic acid	12 d
	57	F	10 h	5 d	Bil knee	Dressing with silver sulfadiazine	2 wk
	59	M	48 h	3 wk	Anterior and posterior surface right knee	Skin graft	1 wk
	63	M	48 h	20 d	Left knee	Skin graft	1 wk
	81	F	24 h	1 wk	Right knee	Dressing with fusidic acid	9 d

Methods

The cases who were admitted to our hospital between May 2013 and January 2015 with the complaints of burn injuries developed due to the topical use of *Ranunculus arvensis* plant were examined retrospectively. The data of the patients (age, gender, application duration of the plant, time to admission to hospital following the application of the plant, site of lesions, treatment method administered) were examined and presented in tables (Table 1).

Results

One of our patients was a child and the others were adult. Their ages ranged between 10 and 81 years. Of them, three were female and two were male. Four cases used *Ranunculus* plant in order to treat knee arthralgia while it was applied for the pain in the head and neck pain in one case. The patients crushed the plant into a pulp with the suggestion of their neighbors or friends, smeared over the painful area and then kept covered with a clean cloth (10-48 hours). They admitted to hospital 5-21 days after opening the dressing. Burn injury

occurred in the knee regions of four cases whereas burn injury developed in the nape of the neck only in one case. Three burn injuries were superficial second degree while two were deep second-degree burn injuries (Fig. 2).

The past medical histories of the patients revealed that one patient was receiving treatment for a benign brain neoplasm. This patient was on oral antidiabetic medication due to diabetes mellitus. Another case had hypertension.



Fig. 2: Burn areas of cases during presentation veya at presentation

After performing wound debridements in three cases who were treated as the inpatients in the burn unit, daily wound dressing was performed with topical silver sulfadiazine, topical fusidic acid (9-14 days). No complication was observed in these cases with epithelized wound sites. The remaining two cases had applied *Ranunculus* for a long time (48 hours). They were admitted to the hospital after a long period of time like three weeks. These cases were treated by placing skin grafts when convenient after performing wound debridement and dressings as in other three cases. No complication was observed during follow-up.

Discussion

Despite advances in the modern medical science, alternative treatment methods are still frequently used nowadays. Particularly in the rural areas of population, due to low socioeconomic level and difficulty in access to the hospital, the patients attempt to heal their diseases by their own means. Plants growing around are generally used for treatment purpose. The most commonly used plant is *Ranunculus arvensis* and it is abundant in the mountainous parts of the region during the spring months.

The plants belonging to this genus were reported to be used generally for the treatment of skin diseases, hemorrhoids, edema, abscess drainage, wounds, rheumatic diseases, and interestingly also for the treatment of burn injuries [4-7]. Although *Ranunculus* plant grows in many regions of the world, burn injuries secondary to the use of this plant were only reported in Turkey.

Ranunculus is a large herbaceous plant including approximately 66 genes and 2000 species [8]. The species of *Ranunculus* contains the glucoside of ranunculin in their stems and leaves. The damaged root or stem of the plant induces an enzyme converting the glucoside of ranunculin to protoenamine. Protoenamine has antimicrobial and antimitotic properties [9]. Protoenamine is a very irritant and volatile oil responsible for the toxic and irritant effects of the plant, which inhibits DNA polymerase by increasing free oxygen radicals [10]. In case of its contact with the skin, it breaks sulfur bridges, causes subepidermal detachment and produces blisters [11].

It was reported that the fresh plant is more irritant and the plant does not contain protoenamine after it is boiled and it is, therefore, less harmful [5,12]. However, a study conducted stated that burn injury developed in the patients who applied the plant

after boiled and cooled [11]. Our cases crushed the fresh plant into a pulp and then applied to their skins.

In a study conducted by Albayrak et al., the adverse effects of the plant on the skin were reported to occur through three mechanisms including irritating, phototoxic and hypersensitivity reactions. It was reported that burn injury developed as a result of irritating effect [1]. The skin lesions induced with the use of various species of *Ranunculaceae* family as alternative treatments were named as phytodermatitis [5,6,13] phytotocontact dermatitis [3,7,14,15] by dermatologists. Lesions were reported as burns in the studies conducted by emergency and surgical departments [1,4,9,11,12,16]. Since both terms are used to describe the loss of skin integrity which is formed by similar mechanisms, it was noted that the treatment of these cases should be consistent with the burn treatment [7]. Burn treatment was administered to our cases.

As in case of thermal burns, topical creams were administered to the superficial burns in *ranunculus*-induced burns [1,3,4,8,12,13]. Also, similarly, deep burns were treated with the skin graft. In a study reported by Eskitascioglu et al., skin graft was applied to a case in whom burn injury developed after topical use of *Ceratocephalus Testiculatus*, a member of *Ranunculus* family, for 12 hours [9]. Kocak A.O et al. reported that they applied the flap therapy to a similar case. In our cases, skin grafting was applied in two cases while wound dressing treatment was successful in three cases.

A study noted that the degree of the burn was consistent with the method and duration of application of the method [9]. Another study stated that the severity of the lesion was associated with the amount of plant used, duration of contact, and size of contact area [11]. In the study by Akbulut et al., the length of contact duration of the plant was reported to be associated with the depth degree of burn [7]. In our patients with more than 48 hours of contact with the plant, the degree of the burn was observed to be deep enough to require grafting while superficial burns occurred in the cases with shorter contact duration with the plant.

Conclusion

Ranunculus arvensis administered as alternative herbal treatment causes serious burns. Burns can be superficial or deep depending on the application duration of the plant. Patients can be treated with the methods applied for thermal burns.

References

1. Albayrak Y, Albayrak A, Melikoglu M, Kordali S. Chemical burn caused by *Ranunculus arvensis*. *Wounds*. 2011;23(3):e6-e8.
2. Koyuncu AM, Koyuncu H, Haftacı E, Orhan ÖA. Burns Case Due to *Ranunculaceae*. *J Clin Anal Med* 2014;5(suppl 1):86-7.
3. Ucmak D, Ayhan E, Meltem Akkurt Z, Ucak H. Presentation of three cases with phyto contact dermatitis caused by *Ranunculus* and *Anthemis* genera. *J Dermatolog Treat* 2014;25(6):467-9.
4. Orak M, Ustundag M, Guloglu C, Tas M, Baylan, B. A skin burn associated with *Ranunculus arvensis* (wedding bloom). *Indian J Dermatol* 2009;54Suppl S1:19-20.
5. Metin A, Calka O, Akdeniz N, Behçet L. Phytodermatitis from *Ceratocephalus falcatus*. *Contact Dermatitis* 2005;52(6):314-6.
6. Karaca S, Kulac M, Kucuker H. Phytodermatitis caused by *Ceratocephalus falcatus* (*Ranunculaceae*). *Eur J Dermatol* 2005;15(5):404-05.
7. Akbulut S, Semur H, Kose O. Phytocontact dermatitis due to *Ranunculus arvensis* mimicking burn injury: report of three cases and literature review. *Int J Emerg Med* 2011;21;4:7.
8. Hoot SB. Phylogeny of the *Ranunculaceae* based on epidermal microcharacters and macromorphology. *Systematic Botany* 1991;16:741-55.
9. Eskitaşçıoğlu T, Dogan F, Sahin G, Ozkose M, Coruh A, Ozyazgan I. An extraordinary chemical burn injury case: buttercup a report of five cases. *Burns* 2008;37:724-30.
10. Li RZ, Ji XJ. The cytotoxicity and action mechanism of ranunculin in vitro. *Yao Xue Bao* 1993;28:326-31.
11. Kocak AO, Saritemur M, Atac K, Guclu S, Ozlu I. A rare chemical burn due to *Ranunculus arvensis*: three case reports. *Ann Saudi Med*. 2016;36(1):89-91.
12. Sayhan MB, Gokdemir M.T, Guloglu C, Orak M, Ustundag M. A burn case associated with *Ranunculus arvensis*. *Anatol J Clin Investig*. 2009; 3:85-7.
13. Polat M. A case of phytodermatitis due to *Ranunculus arvensis* used as an herbal remedy. *Int J Dermatol*. 2016;55(1):e37-8.
14. Köse R, Okur MI, Bingol I, Cetin H. Phytocontact dermatitis mimicking a burn injury due to *Ranunculus constantinopolitanus*. *Contact Dermatitis*. 2008;59(4):249-50.
15. Elmas O, Kızılyel O, Metin M S, Bilen H, Atasoy M. Phyto Contact Dermatitis Caused by *Ranunculus Damascenus*: A Case Report. *Kafkas J Med* 2015;5(3):120-22.
16. Coskun A, Demir T, Ozbay S, Kayipmaz AE, Okur OM, Ozkan I, Eren SH, Kavalci C. Three Cases of Burn Injury Due to Topical *Ranunculus* Use. *Medicine Science* 2016;5(3):838-44.