



Contact with wet cement: an unrecognized cause of chemical burn

Kimyasal yanığın bilinmeyen bir nedeni: Islak çimentoyla temas

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Chemical burns account for a small percentage of admissions to burn units. Wet cement is a poorly recognized cause of chemical burn. As the construction industry is growing, individuals will likely have more contact with this material and be more prone to its harmful effects. Wet cement can cause severe full-thickness burns with prolonged contact, but this property is not well known among professional users. The lack of information about the potential hazards of wet cement makes it an important problem that must be considered more seriously as a risk factor for chemical burn. Increasing public knowledge of the necessary preventive measures is crucial for avoiding this type of chemical burn injury. Here, we report a case with full-thickness burn that occurred while working with wet cement without proper protection.

Key Words: Chemical burn; wet cement.

Kimyasal yanıklar, yanık ünitelerine başvuruların çok az bir yüzdesini oluşturmaktadır. Islak çimentoyla temasın kimyasal yanık oluşturabileceği bilinmemektedir. İnşaat sektörünün giderek büyümesiyle birlikte, bu maddeyle temas etme ve zararlı etkilerine maruz kalma ihtimalide artmaktadır. Uzun süren temas sonucu ıslak çimento ciddi yanıklara neden olabilmekte, ancak bu özelliği profesyonel kullanıcılar arasında bile yeterince bilinmemektedir. Bu maddenin yol açabileceği potansiyel tehlikeler hakkında yeterince bilgi sahibi olunmaması, kimyasal yanık için ciddi bir risk faktörü olarak düşünülmesini dahada önemli hale getirmektedir. Bu maddeyle çalışanların gerekli koruyucu önlemleri alması konusunda bilinçlendirilmeleri, bu tip kimyasal yanıkların önlenmesinde son derece etkili olacaktır. Burada, uygun koruma olmadan ıslak çimento ile çalışırken meydana gelen, tam kat yanıklı olgu sunuldu.

Anahtar Sözcükler: Kimyasal yanık; ıslak çimento.

Cement is a solid material obtained by calcinations. It is composed of a mixture of silicates and calcium aluminates. In wet cement, the oxides are hydrated and the solution becomes highly alkaline, with pH values of about 12.5, so wet cement can cause serious corrosive damage through abrasion and prolonged contact with the skin.

The first report on the damaging effects of wet cement to the skin was published in 1963 by Rowe and Williams.^[1] Cement is increasingly used as a building material in the construction industry and in do-it-yourself work. Contact with cement in the industry or at home is primarily accidental. The lack of information and education regarding risks related to handling

cement has been identified as a potential risk factor for this type of injury. General preventative measures such as public education should have high priority.

Here, we report a case with full-thickness burn that occurred while working with wet cement without proper protection.

CASE REPORT

A 53-year-old woman applied to our clinic with burn around her ankle area bilaterally. She and her husband had been constructing a wall in front of their farm house. She had stood in the freshly poured cement with her bare feet for approximately 4 hours. She related that a few hours into the work, she had

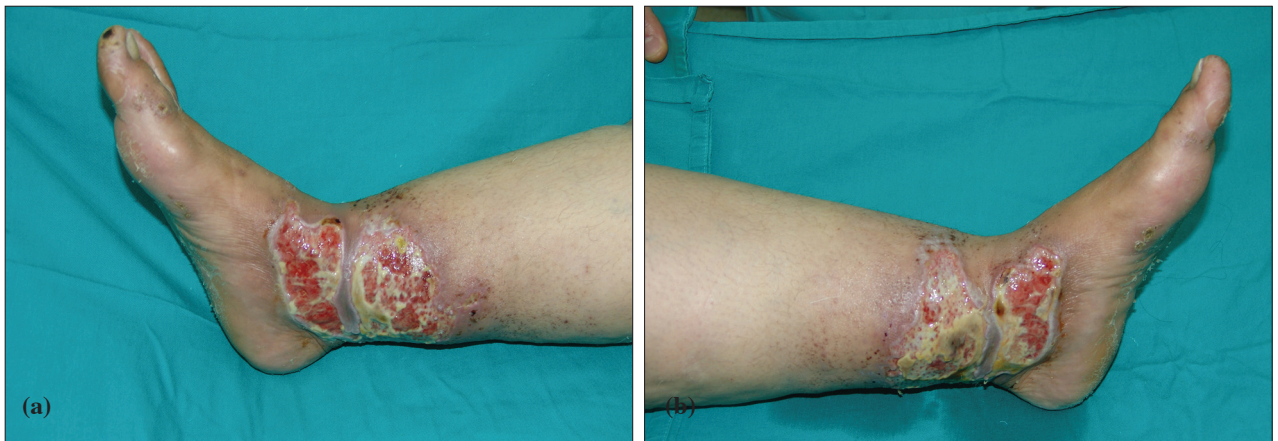


Fig. 1. Second-degree deep burn on the patient's (a) right and (b) left ankle.

(Color figures can be viewed in the online issue, which is available at www.tjtes.org)

become aware of a burning sensation but had ignored it because she was unaware of the potential hazards of cement.

The initial symptoms were pain and erythema. The clinical picture of the full-thickness burn settled in 8-10 hours. In her physical examination, both ankles were severely burned including necrotic areas (Fig. 1a, b).

She was hospitalized, and wound care was applied with daily dressings. On the tenth day of the event, all the necrotic tissues were excised, and the tissue defects were covered using split-thickness skin graft. The wounds healed uneventfully (Fig. 2a, b).

DISCUSSION

Wet cement damages the skin in three ways: 1- Allergic dermatitis as a reaction to its hexavalent chromate ions, 2- As abrasions caused by the gritty nature of the course and fine aggregate in the cement, and 3-

Alkali burns, since wet cement has a pH of 12.5. The severity of the burn depends on the amount of abrasion created by the cement aggregate and the duration of cement contact.^[2]

Cement burns have an insidious onset unlike thermal burns. Most patients only feel a minor irritation and hesitate before consulting a doctor. Meanwhile, if not removed, the cement will continue to corrode and deepen the skin necrosis. A few hours after exposure, burning sensation, pain, erythema, and vesicles occur as the initial symptoms. Twelve to 48 hours later, partial to full-thickness burns characterize the clinical picture. In dermatological articles, contact dermatitis due to cement has been mentioned.^[3,4]

Cement contains lime (calcium oxide), which will potentially penetrate clothing and react with sweat, causing an exothermic reaction. To prevent cement burns, contaminated clothing should be removed and the skin thoroughly washed with a copious amount



Fig. 2. (a) Frontal and (b) dorsal views of both ankles one month after the operation.

(Color figures can be viewed in the online issue, which is available at www.tjtes.org)

of water immediately. The initial treatment should be started at the scene of the accident.

Soaking the area with buffered phosphate solution or 1% acetic acid solution has also been recommended, but this practice is debatable, as the heat produced by the exothermic chemical reaction of neutralization could worsen the burns. Early referral to a burn unit should be considered. If full-thickness burn occurs, early wound excision and skin grafting are indicated to remove alkalinized and damaged tissue.

Cement burns usually affect only a limited total body surface area (BSA) (rarely greater than 5%). Classically, these burns occur when the cement has been freshly poured and the worker remains kneeling or standing in the wet product for a long time. The most commonly affected sites are the extremities, especially the lower limbs, notably the ankles, feet and knees.^[5]

Retrospective studies show that a high proportion of cement burns (75% or more) are full-thickness burns requiring wound excision and grafting. A longer hospitalization of patients was required for complete skin healing in those with cement burns than in the overall burn group. In this group of patients, slow healing, graft failure and re-grafting are more common when compared to full-thickness lower extremity burns of different etiology in the same area.^[6]

In a study by Lewis et al.,^[2] 51% of patients stated that they were unaware of the risk of cement burns and took no precautions. This study has shown that cement burns may have resulted from shortcomings in the in-

formation and warnings provided to the customers by the manufacturers.

The growth of the construction industry will cause an increase in the frequency of cement burns. Preventive measures such as greater public awareness and hazard warnings on containers should be implemented.

Wearing suitable gloves and personal protective equipment can also be regarded as a protective measure for both construction workers and non-professional users. It is likely that many of the burn injuries caused by contact with this potentially hazardous chemical material can be avoided if adequate information is provided and the necessary precautions are taken.

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