OLGU SUNUMU CASE REPORT

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Use of Powdered Sugar in Pressure Injuries

Basınç Yaralanmalarında Pudra Şekeri Kullanımı

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ABSTRACT The study examined a pressure ulcer that progressed in a short time in an immobile patient who was treated for a non-vehicle traffic accident. In addition to applying the vacuum-assisted wound care protocol to the patient, powdered sugar was used in wound care because the expected progress could not be achieved. The patient's wounds was evaluated daily using the Pressure Ulcer Scale for Healing. Significant improvement was achieved in the patient's pressure injuries (sacrum-number 1; stage 2, score: 7, right and left heel number 2-3; stage 2, score: 6, vertebra-number 4; stage 2, score: 4, scapula-number 5; stage 2, score: 4) with the use of powdered sugar. The patient was discharged on the 37th day of his admission to the thoracic surgery ward after contacting home care services. Improvement in the patient's pressure ulcers was ensured with the use of powdered sugar.

Keywords: Nursing; pressure injuries; sugar

ÖZET Çalışmada, araç dışı trafik kazası nedeniyle tedavi gören hareketsiz bir hastada, kısa sürede ilerleyen basınç yaralanması incelendi. Hastaya vakum yardımlı yara bakım protokolü uygulanmasının yanı sıra beklenen ilerleme sağlanamadığından, yara bakımında pudra şekeri kullanıldı. Hastanın yaraları Basınç Ülseri İyileşme Skalası kullanılarak günlük olarak değerlendirildi. Hastanın basınç yaralanmalarında (sakrum-numara 1; evre 2, skor: 7, sağ ve sol topuk-numara 2-3; evre 2, skor: 6, vertebra-numara 4; evre 2, skor: 4, skapula-numara 5; evre 2, skor: 4) pudra şekeri kullanımıyla belirgin düzelme sağlandı. Hasta, evde bakım hizmetleri ile görüşülerek göğüs cerrahisi servisine yatışının 37. gününde taburcu edildi. Pudra şekeri kullanımı ile hastanın basınç yaralanmalarında düzelme sağlandı.

Anahtar Kelimeler: Hemşirelik; basınç yaralanmaları; şeker

Pressure injuries (PIs) are defined as localized tissue injuries that usually develop on bone protrusions or in the skin or subcutaneous tissues in relation to a medical device or other devices due to many reasons such as pressure, friction, shearing, and moisture.[1-3] In this case, powdered sugar was preferred because one of the authors used powdered sugar on pressure sores and got positive results.

The role of sugar in wound healing:

The use of sugar for wound healing is one of the most cost-effective methods due to sugar being readily available. Sugar has an antimicrobial effect and can reduce wound exudate, odor, and edema.[4] Sugar has been used to reduce wound odor by inhibiting bacterial growth via an osmotic effect in patients with malodorous wounds.[5] It is stated to reduce drainage, promote epithelialization, reduce pain during dressing changes, and suppress bacterial growth.[6-8]

CASE REPORT

A 32-year-old male patient without a known disease history was transferred to our hospital in April 2021 due to a non-vehicle traffic accident. The first evaluation revealed that the patient had fractures in the right pubis, bilateral rib and sternal fractures, flail chest, and bilateral hemopneumothorax. Stage 1 PIs

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were recorded on the sacrum (number 1) and the right and left heels (number 2-3) on the 7th day of intensive care unit (ICU). Stage 2 the sacrum (number 1) PIs were recorded on the 16th day, and stage 3 the sacrum (number 1) PIs were recorded during the reevaluation made on the 24th day despite the application of wet dressing with hypochlorous acid (HOCl) in addition to current practices. Moreover, PIs developed in the vertebra (number 4), scapula (number 5). On the 60th day of the patient's stay in the ICU, PIs were evaluated in the sacrum (number 1) (stage 4), right and left heels (number 2-3) (stage 3), vertebra (number 4), (stage 3), and scapula (number 5) (stage 3). Vacuum-assisted closure (VAC) was started to be applied to the sacral wound (number 1) (Figure 1, Figure 2, Figure 3).

The patient was extubated on the 60th day of his admission to the ICU and transferred to the thoracic surgery ward on the 66th day after his hemodynamics stabilized. The patient was evaluated daily using the Pressure Ulcer Scale for Healing (PUSH). It was revealed that the patient had PIs in the sacrum (number 1) (stage 4, PUSH score: 10), right and left heels (number 2-3) (stage 3, PUSH score: 10), vertebra (number 4), (stage 3, PUSH score: 10), and the scapula (number 5) (stage 3, PUSH score: 10).

Wet dressing with physiological saline solution was applied to the patient's PIs 3 times a day. Creams supporting the granulation and epithelization processes Wcura G, Wcura C were applied to the wound and its surroundings, a Med-Cover barrier cream with zinc content was used for intact skin, and foam dressing was used for bone protrusions.[2,9]

On the 5th day of his admission to the thoracic surgery ward, the patient was mobilized for the first time by making him take 2 steps. The visual analog scale was evaluated as 4 regardless of the intervention. No significant improvement was observed in the patient's PIs (sacrum-number 1; stage 4, PUSH score: 9, right and left heels- number 2-3; stage 3, PUSH score: 9, vertebra-number 4; stage 3, PUSH score: 9, and scapula number-5; stage 3, PUSH score: 8). It was decided to apply sugar-based compounds topically to support wound healing.[10]

The following wound dressing procedure was applied:

- Dead tissue in the wound was surgically debrided.
- The wound was washed with saline.
- The wound and its surroundings were dried with sterile gauze.
- Barrier cream was applied to the intact skin around the wound.
- Powdered sugar was applied on the wound with a thickness of about 0,1-0,2 cm.
- The wound and its surroundings were finally covered with sterile dry gauze.[10]

The PI in the sacral region (number 1) was cleaned with physiological saline solution, and powdered sugar was applied as a thin layer by the thoracic surgery team. On the 5th day of his admission to the thoracic surgery ward, the VAC application was continued by wound care and thoracic surgery nurses under the ward conditions. The VAC dressing was

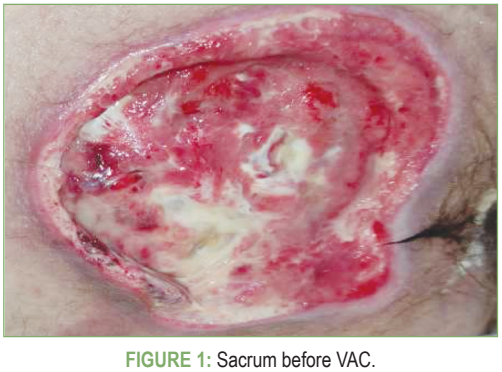

FIGURE 1: Sacrum before VAC.
VAC: Vacuum-assisted closure.

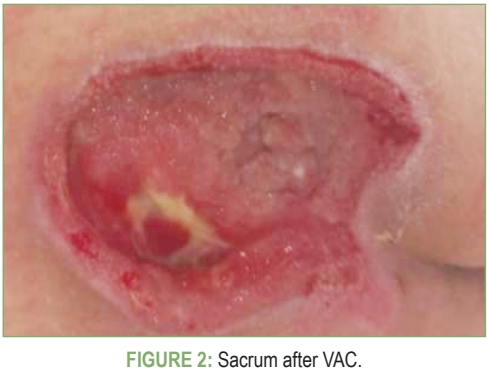

FIGURE 2: Sacrum after VAC.
VAC: Vacuum-assisted closure.

FIGURE 3: Dorsal region before powdered sugar application.

changed every 3 days. After the patient's other PIs (right and left heels- number 2-3, vertebra- number-4, scapula- number-5) were cleaned with physiological saline solution 3 times a day, care was continued using only powdered sugar. Since significant improvement was observed in the patient's general condition and PIs (sacrum- number 1; stage 2, PUSH score: 7, right and left heels- number 2-3; stage 2, PUSH score: 6, vertebra- number 4; stage 2, PUSH score: 4, scapula- number 5; stage 2, PUSH score: 4), the patient was discharged after contacting home care services on the 37th day of his admission to the thoracic surgery ward (Figure 4, Figure 5). Patient's VAC dressing was stopped upon discharge from hospital. The care of the patient's PIs was continued at home with powdered sugar, and his PIs were evaluated by calling the patient for control at the outpatient clinic once a month. Significant improvement in PIs was achieved 3 months after discharge (Figure 6). After discharge, the patient was offered the same procedure (powdered sugar) for wound care. The patient was called to the outpatient clinic once a month, and his PIs were evaluated.

ETHICAL CONSIDERATIONS

The patient and his relatives were informed about the information and photographs that would be used in the article as a case report, and his written informed consent was obtained. To perform the study, the necessary written permissions were obtained from Trakya University Health Research and Application Centre's.

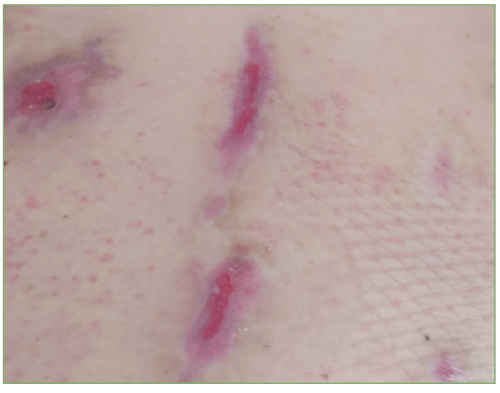

FIGURE 4: Dorsal region after powdered sugar application.

FIGURE 5: Sacrum area after powdered sugar application.

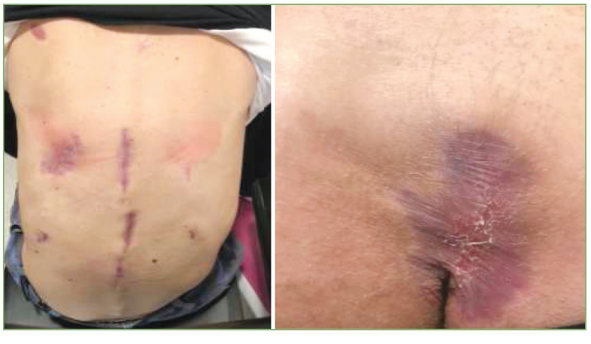

FIGURE 6: 3 months after discharge.

DISCUSSION

Powdered sugar was applied to the patient's PIs, which progressed rapidly in a short time. It is stated in the literature that the topical administration of sugar-based compounds (honey, glucosamine, etc.) to the wound supports the formation of granulation tissue, stimulates contraction, reduces edema in the wound due to its local osmotic effect, increases the

bacteriostatic effect by lowering the wound pH, and supports the expansion of small blood vessels.[11] Naselli et al. applied powdered sugar directly to the wound in a pediatric patient with a multiple antibiotic-resistant wound and reported improvement in wound healing.[12] Sugars (saccharose, glucose) reduced the formation of key protein toxins responsible for the beginning and progression of gas gangrene, according to Méndez et al.[13] An in vitro study revealed that sugar stopped bacterial growth in the wound.[14] Dealey and Murandu used powdered sugar in a case with PIs in the sacrum and heel and determined that sugar helped clean the wound and liquefy necrotic tissue due to its osmotic effect.[15] In this case, PIs were observed to regress to stage 1 in the heels, vertebrae, and scapula after the use of powdered sugar. PIs regressed from stage 4 to stage 2 after VAC and powdered sugar application to the sacral region. Based on the study findings and our experience, it can be said that the use of sugar-based products contributes positively to wound healing.

Source of Finance

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

***Idea/Concept:** Ayşe Gökçe Işıklı, Yekta Altemur Karamustafaoğlu, Zeynep Kızılcık Özkan; **Design:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan, Yekta Altemur Karamustafaoğlu; **Control/Supervision:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan, Hakan Şen; **Data Collection and/or Processing:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan, Yekta Altemur Karamustafaoğlu; **Analysis and/or Interpretation:** Ayşe Gökçe Işıklı, Yekta Altemur Karamustafaoğlu, Hakan Şen; **Literature Review:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan, Yekta Altemur Karamustafaoğlu, Hakan Şen; **Writing the Article:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan; **Critical Review:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan, Yekta Altemur Karamustafaoğlu; **References and Fundings:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan, Yekta Altemur Karamustafaoğlu, Hakan Şen; **Materials:** Ayşe Gökçe Işıklı, Zeynep Kızılcık Özkan, Yekta Altemur Karamustafaoğlu, Hakan Şen.*

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