

Vulnerable Wound-base Cells Protected by Coffee Powder to Better Healing

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Abstract Case reports of a chronic diabetic wound treated topically using coffee powder. It is a useful dressing that changed every week with keep dry without repeated manipulation to wound bed to protect the new cell growth. It claimed to be a safe procedure to preserve the vulnerable cells in wound bed by the coffee powder producing the best healing with acceptable wound scar.

Keywords: wound bed cells, wound healing, diabetes mellitus, coffee powder, acceptable scar

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1. Introduction

The study of wound healing is an exciting objective. Many medical scientists have done experiments of wound that resulted in many theories concerning some essential aspects of treatment. They created a method of wound treatment applying sterile gauze, antibiotic cream, modern wound dressing, negative pressure treatment, a hyperbaric oxygen chamber. The characteristic of the wound healing treatment has now become more costly, low availability, difficult to practice, and not a simple treatment.

Thus, the paper below explaining the practicable and acceptable wound dressing for a diabetic foot ulcer.

2. The Case

2.1. Case no.1

A 72-year-old-woman contracted a deep chronic infected diabetic right heel ulcer measuring 6cm x 3cm with deep 2.5cm [1]. The wound base was very close to the surface of the right calcaneus bone. The surface of the bone is separated only by thin tissues, so it seemed to be tactile. The wound base area was oozing, but not painful because of neuropathy. She had already suffered the injury for one year, which was initially shallow wound, the longer it grew in. He refused underwent any surgical tissue transplantation, and then he sought the second opinion and agreed to apply the coffee dressing. The results of the laboratory examination of urine, and the organ function of the heart, lung, kidney, and liver, were within a reasonable limit. The blood glucose was higher than 200mg/dL, difficult to control using diabetic diet, and insulin injection in the first two months of treatment.

A broad-spectrum oral antibiotic was given for seven days. In the third month, the randomized blood glucose, fasting, and two hours postprandial was better controlled.

The wound at the right heel was still oozing but decreasing on the third month, and less on the fourth month of treatment.

The coffee dressing changed was performed without wet soaking, and the coffee layer in proximity to the wound bed surface was maintained.

It functioned to guard the new cells with its growing activity from any manipulation.

The coffee powder used obtained from a local product from a coffee shop in Bandung, Indonesia, and it was a robusta coffee product. The amount of coffee powder was about 80gram-90gram that changed once every 1-2 week [1]. The coffee bulk closed by gauzes and some adhesive tapes.

The patient treated ambulatory using coffee powder at home, assisted by her family member. The family was already informed concerning the detailed procedure of the dressing changed. As an ambulatory patient, mobilized using a wheelchair, she was periodically once every 1-2 weeks meet the doctor in the first month to the third month, and once every three weeks from the 4th month to the 6th month.

The patient has some co-morbidities, obesity (body weight 90kg, 165cm tall, BMI 33.09), high blood uric acid, high blood cholesterol, and triglyceride. All morbidities solved after five months of treatment using 20mg oral simvastatin, 5mg amlodipine tablets, and vegetarian style.

The wound bed was step by step became shallow, and about the 22nd week to 24th week showed the wound closed by acceptable scar tissue. It is the healing by secondary intention. The scar tissue was not hypertrophic, and the outer shape was slightly concave [1].

The patient looked happy and during treatment not felt any pain.

During treatment, the patient also has appointments to have a kind of physiotherapeutic training every 1-2 weeks. After eight months of training her body weight improving into 70kg, and she could mobilize using a walker.

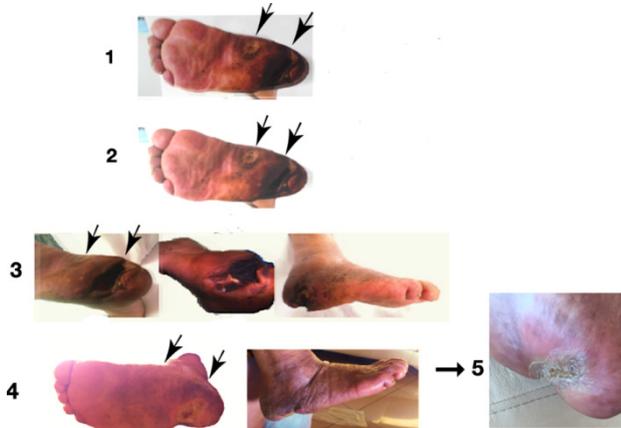


Figure 1. Case no.1: A deep wound in the right heel emerged without any sign of osteomyelitis. After six months, the wound closed by acceptable scar tissue [1]. The arrows are pointing to the wounds



Figure 2. Case no.2: A 42 year-old-man suffered a complicated wound caused by diabetes mellitus type-2 in a non-ischemic limb. 1. A high blood sugar level causes the scratched wound to become infected and widens, suppurating. 2. After cleaning the wound on the first day only, and cleaning is not repeated in the following days, given 100gram robusta coffee powder and wrapped in gauze. 3. The epithelial cells closed the wound in the 4th month.

2.2. Case no.2

A diabetic wound at right dorsal foot of a 42-year-man measuring 8cm x 6cm is chronic, festering, with the base of the wound is a subcutaneous layer. Initially, it was a small wound with a not known cause, which increased in width together with high blood sugar level more than 200 mg/dL, and leukocytosis.

A broad-spectrum oral antibiotic administrated for seven days, and stop for no sign of widespread infection. The physician gave him an insulin injection and a diabetic diet. He did not feel pain at all by neuropathy.

The wound treated locally with 100gram coffee robusta powder and fixed with sterile gauze. The coffee and the dressing changed every 7-14 days depend on the condition of the wrapping gauze. The wound was not debrided and the coffee powder directly put on the wound. After four

months treatment, the wound closed by an acceptable scar. It is healing by secondary intention.

He agreed to apply coffee powder after sign informed consent. He likes the conservative treatment policy and refused any surgical treatment (debridement, and skin graft). The ambulant patient was able to walk freely, and have to meet the physician every 1-2 weeks.

The blood sugar level became standard in the second month.

The wound heals without any sign of joint contracture.

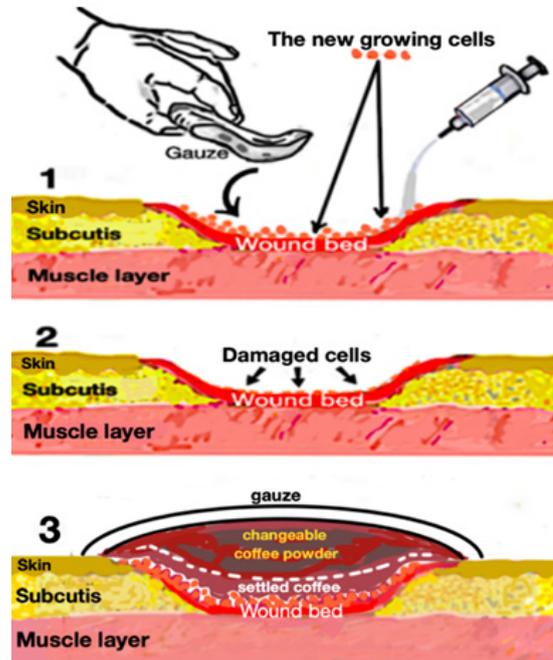


Figure 3. Picture 1 and 2: The perpetual cleansing affects the new growing cell damaged. For that, frequent cleansing (wetting and rubbing) of the wound bed should be avoided. The damaged cells in Picture 2 need to grow and regrowing again that need more energy, time, and cost. Picture 3: The settled coffee is the coffee layer maintained (not changed coffee) at the wound bed to protect the new growth cells. The more often the wound surface is affected by trauma, the healing should be slower than without injury

3. Discussion

3.1. The Vulnerable Cells in Wound Bed

In the wound bed of acute or chronic infection, many new growing cells are starting to thrive as natural reflexes after an injury to fill and replace dead cells. The cells that are just growing are susceptible to trauma caused by perpetual washing and cleaning of the wound.

Washing will raise the pH of 4.0-4.5 into higher at the wound bed — the water carrying the surrounding skin bacteria into the wound [3]. Increasing pH causes bacteria to develop.

The new cells are essential not to be damaged, so that wound healing is faster [2].

The cell layer that damaged due to manipulation will replace by the cells that grow next. Although dead cells undergo replacement (repopulation) with new ones, they will require additional time which results in longer healing times, and more energy wasted, higher costs, and provokes patient complaints in the form of pain [2].

Therefore, to maintain these cells from trauma requires a procedure without any traumatic actions. It has to do debridement only once at the beginning in infected wounds. Then, of course, the more often the wound surface is affected by trauma, the healing should be slower than without injury.

The new layer of cells growing on the surface of the wound is a layer of cells that are sensitive to trauma, called vulnerable cells that should be protected and must be considered by each wound manager [2].

3.2. Coffee Powder is the Leading Topical Dressing

Which wound cover is the best to protect the vulnerable cells? More than 15 years of research experience shows that coffee powder meets the requirements [1].

The coffee powder put into the wound shall be an effective antioxidant, antimicrobial, anti-inflammatory [1,4]. Those capabilities are essential to counter the pathology of the wound to scavenge the oxidator production, to oppose the inflammatory reaction, and against the microbial contamination. The coffee powder can last a long time in a wound bed without causing severe problems. The later caused by antimicrobial capacity after the coffee powder mixed with the wound fluid produced a hyperosmolarity solution, and H₂O₂ as well [5]. The water extract of coffee powder has a powerful inhibition zone (22.40 mm) in Methicillin-resistant Staphylococcus aureus culture (MRSA) disc [1]. It makes the coffee powder stay longer for weeks in the wound bed. Coffee prevents the screen gauze from sticking to the surface of the wound bed so that when it replaced, it does not damage the cells [6].

The coffee has a lovely scent that may rise a kind spirit to the patient for healing in a foul smell wound or not [1]. The coffee odor is very attractive to everyone, particularly to the coffee drinker, caused by more than 800 aromatic compounds [7]. The coffee popularity causes acceptable for wound dressing.

4. Conclusion

Both cases informed the management of diabetic wound can apply coffee powder with a simple procedure, without any manipulation to the wound bed, creates agreeable healing.

Acknowledgements

None.

Conflict of Interest

The authors confirm that this article has no conflict of interest.

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