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Modern Wound Care Using Cadexomer Iodine 0,9% Dressing in the Granulation Process of a Grade 4 Diabetic Foot Ulcer: Case Study

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Abstract: Diabetic foot ulcers are a serious complication of diabetes mellitus that require comprehensive management to prevent further adverse outcomes. This study aimed to evaluate the effect of modern wound management using 0.9% cadexomer iodine on the granulation process in a grade 4 diabetic foot ulcer. A case study was conducted involving a 54-year-old male patient, referred to as Mr. "Z," who received 0.9% cadexomer iodine as part of his wound care intervention three times per week. The findings demonstrated an increase in granulation tissue of up to 75% as measured by the Bates-Jensen Wound Assessment Tool (BWAT) during the treatment period. The use of 0.9% cadexomer iodine was found to be effective in enhancing granulation tissue formation and promoting wound healing in diabetic foot ulcers.
Keywords : Diabetic foot ulcer, cadexomer iodine 0,9%, granulation.

INTRODUCTION

Diabetes mellitus is a chronic disease characterized by the inability of the pancreas to produce sufficient insulin or the body's inability to use insulin effectively[1]. One of the most common complications in patients with uncontrolled diabetes is diabetic foot ulcer[2]. This condition is characterized by skin damage that may extend to the underlying tissue, tendons, muscles, and even bones[3].The 10th edition of the Diabetes Atlas by the International Diabetes Federation (IDF) reported that 537 million adults aged 20–79 years were living with diabetes, equivalent to about 1 in 10 people. This number is projected to increase to 643 million by 2030 and reach 783 million by 20454. In Indonesia, the 2023 National Health Survey recorded 877,531 cases of diabetes mellitus, with the highest prevalence in West Java at 156,977 cases, while South Sulawesi reported 29,481 cases[5].

The prevalence of diabetic foot ulcers in Indonesia is relatively high, with an amputation rate of up to 30% and an annual mortality rate of around 32%. Globally, more than one million people undergo amputation of one of their legs each year[6]. A study conducted in the endocrinology outpatient clinics of several hospitals in eastern Indonesia found that among 249 patients, 55.4% had risk factors for diabetic foot ulcers, while the prevalence of existing ulcers was recorded at 12%[7]. The use of modern dressing techniques in wound care interventions can promote granulation tissue formation, thereby reducing wound size and accelerating healing compared with conventional dressing methods[8]. Cadexomer iodine 0.9% is one example of an antimicrobial dressing used in modern wound care practice and has been proven effective in reducing microbial load and biofilm while enhancing the granulation process in diabetic foot ulcers[9].Based on these findings, it is expected that modern wound care using 0.9% cadexomer iodine can enhance granulation tissue formation, accelerate wound healing in diabetic foot ulcers, and improve patients' quality of life. The objective of this case report is to describe the effect of

modern wound care using 0.9% cadexomer iodine on granulation tissue formation in a patient with a grade 4 diabetic foot ulcer treated at Griya Afiat Clinic with a frequency of three sessions per week.

CASE

Mr. Z, a 54-year-old male, presented to Griya Afiat Clinic on September 30, 2024, with complaints of a blistering wound on the dorsum of his left foot that had extended to the plantar surface and was suspected to be diabetic gangrene. On October 1, 2024, he underwent surgical amputation of the fifth digit of the left foot (digiti V pedis sinistra) and received diabetic foot wound care through home care services, which had been carried out three times since October 7, 2024. On wound assessment conducted on October 14, 2024, the patient was found to have a grade 4 diabetic foot ulcer measuring 11.2 cm in length and 8.5 cm in width. The wound edges were not attached to the wound base, with a cavity depth of 2.8 cm. Necrotic tissue accounted for 5% and was easily debrided, granulation tissue was 60%, epithelialization was 5%, and purulent exudate was present in large amounts, soaking up to 80% of the dressing. The wound depth involved the full thickness of the skin with extensive tissue destruction and damage extending to bone. Vital signs showed a blood pressure of 125/80 mmHg, pulse rate of 81 beats per minute, respiratory rate of 22 breaths per minute, and body temperature of 36.7°C. Blood glucose examination revealed a random blood sugar level (RBS) of 418 mg/dL. Wound care was performed every two days, or three times per week, using 0.9% cadexomer iodine as the primary dressing.

METHODS

This study was a prospective case report involving a single patient who received wound care three times per week. Wound healing was assessed using the Bates-Jensen Wound Assessment Tool (BWAT). Demographic data and wound assessment were obtained through direct interviews with the patient using the Wound Care Nursing Care format from the Nursing Professional Program, Universitas Muslim Indonesia.The wound care intervention was implemented using 0.9% cadexomer iodine as the primary dressing, with additional combination dressings applied as needed. Photographic documentation was collected to monitor wound progression from the first to the third day of treatment.

RESULT AND DISCUSSION

The results of this study present data on the progression of BWAT scores during wound care interventions from the first to the third day, using modern dressing with 0.9% cadexomer iodine in Mr. Z, a patient with a grade 4 diabetic foot ulcer post-amputation of the fifth digit of the left foot (digiti V pedis sinistra), focusing on the granulation process.The evaluation of wound care progression with 0.9% cadexomer iodine dressing was demonstrated through a comparative analysis of BWAT scores over the course of treatment, as well as visual documentation, as shown in the following results:

Table 1. Comparison of Wound Healing Scores Based on the Bates-Jensen Wound Assessment Tool (BWAT)

Item	Score		
	(14-10-2024)	(16-10-2024)	(18-10-2024)
Size (length x witdt)	5 (11 x 8,2 cm)	5 (11 x 8,2 cm)	5 (11 x 8,2 cm)

Depth	5	5	5
Edges	4	4	4
Undermining	3 (2,8 cm)	3 (2,8 cm)	3 (2,4 cm)
Necrotic Tissue Type	3	3	3
Necrotic Tissue Amount	2 (5%)	2 (5%)	2 (3%)
Exudate Type	5	5	5
Exudate Amount	5	5	5
Skin Color Surrounding Wound	4	4	4
Peripheal Tissue Edema	3	3	3
Peripheal Tissue Induration	1	1	1
Granulation Tissue	3 (65%)	2 (70%)	2 (75%)
Epitheliazation	5 (5%)	5 (7%)	5 (8%)
Total score	48	47	47

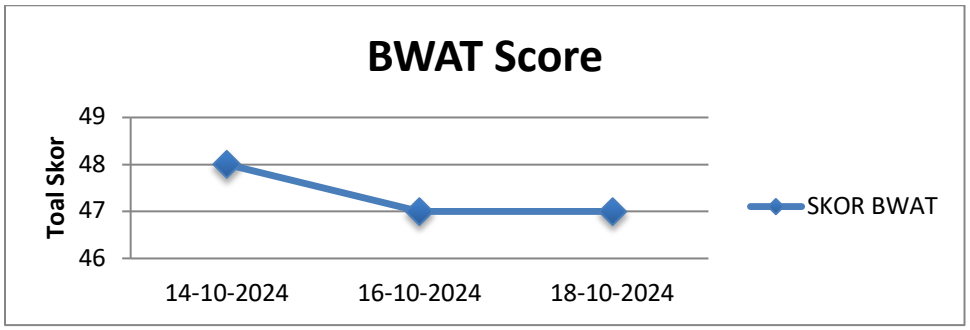
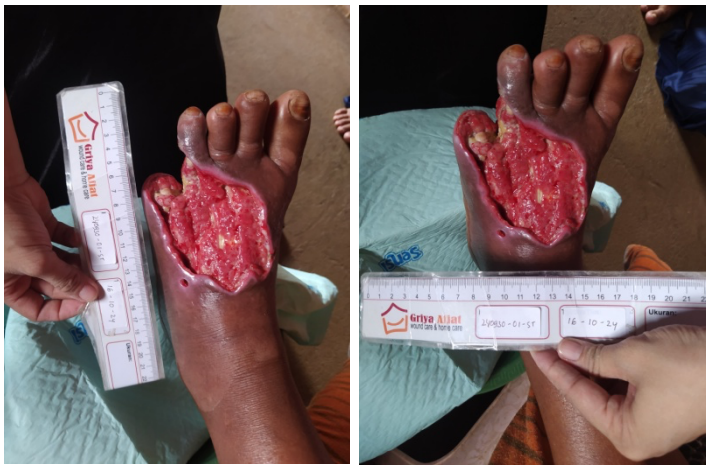


Figure 1 : BWAT Graph

Based on the results presented in the table and graph, changes in wound characteristics were observed according to the BWAT questionnaire. The initial BWAT score prior to the application of 0.9% cadexomer iodine was 48, which then decreased to 47, indicating progressive wound healing although

not yet significant. Improvements were observed in several characteristics, particularly in granulation tissue, wound cavity, amount of necrotic tissue, and epithelialization.

Figures 2 and 3 present the evaluation results following wound care performed on October 14, 2014. The wound demonstrated a combination of black, yellow, red, and pink tissue colors, accompanied by yellowish exudate with an unpleasant odor, in a large amount soaking up to 80% of the dressing. The wound contained 5% necrotic tissue, 30% slough, 65% granulation tissue, and 5% epithelialization. The wound dimensions measured 11.2 cm in length, 8.5 cm in width, with a cavity depth of 2.8 cm at the 1 o'clock position.



Figures 3 and 4 (October 16, 2024) present the evaluation of the second day of implementation. The patient reported that the wound was still moist and malodorous but did not experience pain or a burning sensation at the wound site. Observation showed wound characteristics similar to the previous assessment, with black, yellow, red, and pink tissue, accompanied by yellowish exudate with odor, still in a large amount. Necrotic tissue accounted for 5%, slough decreased to 25%, while granulation tissue increased to 70%. The wound size remained 95.2 cm² with a cavity depth of 2.8 cm.

Figures 5 and 6 (October 18, 2024) show evaluation results indicating significant improvement, with necrotic tissue reduced to 3%, slough decreased to 20%, and granulation tissue increased to 75%. Yellowish exudate was still present, although in a slightly reduced amount. The wound cavity also decreased from 2.8 cm to 2.4 cm. Modern wound care using 0.9% cadexomer iodine was combined with

other primary dressings, such as zinc cream. The images illustrate that while progress was evident, complete wound healing was not yet significant, as recovery from grade 4 diabetic foot ulcers may take between 3 and 24 months for full closure.

DISCUSSION

Modern wound care intervention for Mr. Z, a patient with a grade 4 diabetic foot ulcer, was carried out through procedures that included removal of the old dressing, assessment of wound characteristics, and monitoring for signs of infection. The wound was then cleaned using a nontoxic solution or normal saline, along with antibacterial soap in accordance with standard modern wound care protocols. Following wound cleansing and drying, debridement was performed. In this case, mechanical debridement was used to remove necrotic tissue, slough, and biofilm that could be easily cleared. Sharp debridement was also performed to remove slough and necrotic tissue that were difficult to detach from the wound surface or edges. After debridement, the wound was cleansed again and documented through photographs to monitor wound progression. The appropriate dressing for a grade 4 diabetic foot ulcer was selected, with 0.9% cadexomer iodine as the primary dressing, combined with zinc cream during the first session, hydrophobic dressing and zinc cream during the second session, and zinc cream with alginate +Ag during the third session. Secondary dressings included low-adherent absorbent pads and sterile gauze swabs, while tertiary dressings consisted of rolled gauze and adhesive tape.

Cadexomer iodine 0.9% has been shown to be effective in reducing microbial biofilm and accelerating granulation in diabetic foot ulcers[9]. Other studies have reported that the combination of 0.9% cadexomer iodine and zinc cream increased granulation tissue by up to 50% and epithelialization by up to 100% in patients with chronic wounds[10]. The significant reduction in exudate demonstrated the ability of 0.9% cadexomer iodine to create an optimal environment for healing. Its effectiveness is likely attributed to its antibacterial properties that reduce biofilm and necrotic tissue, as well as its ability to efficiently absorb exudate.

The reduction of necrotic tissue creates a healthier wound bed, supporting tissue regeneration and epithelialization. The use of 0.9% cadexomer iodine has been proven to be an essential component of modern wound care for patients with diabetic foot ulcers. Its application not only accelerates granulation and epithelialization but also reduces the risk of infection and further complications, such as amputation. Previous studies confirmed that cadexomer iodine effectively reduces biofilm by up to 80%[11], and that a combination of modern dressings can enhance wound healing efficiency through exudate management and protection against external contamination[12].

The modern dressing approach, particularly the use of 0.9% cadexomer iodine, provides an effective solution to accelerate the healing of diabetic foot ulcers. This underscores the importance of selecting appropriate dressings according to wound characteristics. Modern dressing interventions significantly reduce complications of diabetic foot ulcers and lower amputation rates by up to 30%[6]. The use of antimicrobial-based dressings is therefore crucial in managing chronic wounds[13].

The use of 0.9% cadexomer iodine as a component of modern dressing therapy has shown significant effectiveness in accelerating healing in patients with diabetic foot ulcers[14]. This is reflected in the increase of granulation tissue, reduction of necrotic tissue, and decrease in exudate and infection risk. Beyond clinical benefits, therapeutic success was also supported by a multidisciplinary approach and family involvement, which play a vital role in improving patient adherence to treatment[15]. This modern approach not only accelerates wound healing but also reduces the risk of amputation, thereby improving

the overall quality of life of patients. Further research is needed to explore the underlying mechanisms of 0.9% cadexomer iodine and to expand its application in broader clinical settings.

CONCLUSION

The authors conclude that the use of 0.9% cadexomer iodine as part of modern wound care has the potential to accelerate the healing of diabetic foot ulcers. This was demonstrated by an increase in granulation tissue up to 75%, a reduction of necrotic tissue to 2%, as well as decreased exudate and infection risk. These findings are consistent with previous studies showing that iodine-based dressings can reduce microbial biofilm, support tissue regeneration, and accelerate epithelialization. Beyond clinical benefits, treatment success was also influenced by family support and an optimal multidisciplinary approach. This strategy not only improves wound conditions but also enhances patients' quality of life by reducing the risk of amputation.

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