

**Wound Healing in Diabetic Patients: Investigating the Efficacy of Various Wound Healing Strategies in Diabetic Patients Undergoing Plastic Surgery**Samuel L. Sailo<sup>1</sup>, Hnamte Ram Buatsaiha<sup>2</sup><sup>1</sup>Associate Professor, Department of General Surgery, Zoram Medical College, Mizoram, India<sup>2</sup>Junior Resident, Department of General Surgery, Zoram Medical College, Mizoram, India

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Conflict of interest: Nil

**Abstract:****Background:** Diabetes mellitus significantly increases the risk of compromised wound healing attributable to microvascular illness, neuropathy, infection, and modified inflammatory responses. Individuals with diabetes undergoing plastic surgical interventions are especially susceptible to protracted healing and postoperative complications.**Objective:** To assess and contrast the effectiveness of diverse wound healing methodologies in diabetes individuals following plastic surgery.**Materials and Methods:** This unique research study was carried out at Zoram Medical College over a span of three years. There were 70 diabetes patients that had plastic surgery. Different ways of taking care of wounds were used, and the results were measured in terms of time to healing, infection rate, graft or flap survival, and problems after surgery.**Results:** Improved wound care procedures led to better healing results and fewer complications than standard wound care.**Conclusion:** The correct choice and use of sophisticated wound healing methods greatly improve postoperative results in diabetes individuals who have plastic surgery.**Keywords:** Diabetes mellitus, wound healing, plastic surgery, diabetic wounds, and ways for caring for woundsThis is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Diabetes mellitus is a worldwide health issue that is becoming more common very quickly, especially in developing countries. Poor wound healing is a well-known problem that comes with diabetes and adds a lot to hospital stays, expenditures, and illness [1]. Individuals with diabetes who undertake surgical treatments, particularly plastic and reconstructive surgeries, face an elevated risk of delayed wound healing, infection, wound dehiscence, and graft or flap failure [2].

The pathogenesis of compromised wound healing in diabetes is multifaceted. Hyperglycemia causes problems with the endothelium, lowers the amount of nitric oxide available, slows down angiogenesis, changes the way collagen is made, and weakens the immunological response [3,4]. Neuropathy and microvascular dysfunction further impair tissue perfusion and oxygenation, leading to delayed granulation and epithelialisation [5].

To deal with these problems, a number of wound healing methods have been created, such as traditional saline dressings, enhanced wound dressings, negative pressure wound therapy, growth factor application, and better glycaemic

management [6–8]. In plastic surgery, careful wound care is very necessary for the best cosmetic and functional results. This makes the choice of wound healing approach more important [9]. Even while wound management has come a long way, there is still a lot of disagreement among doctors about the best way to help diabetic patients heal their wounds. The current study is to assess and compare the effectiveness of various wound healing techniques in diabetes patients receiving plastic surgery procedures at a tertiary care facility.

**Materials and Methods****Study Design:** Original prospective observational study.**Study Place:** Department of Plastic Surgery, Zoram Medical College.**Study Duration:** Three years.**Sample Size:** 70 diabetic patients.**Inclusion Criteria**

- Patients with type 1 or type 2 diabetes mellitus

- Patients undergoing elective or reconstructive plastic surgery
- Age above 18 years
- Patients willing to participate and provide informed consent

**Exclusion Criteria**

- Patients with uncontrolled diabetes
- Patients with chronic renal failure or malignancy
- Patients on long-term immunosuppressive therapy
- Non-diabetic patients

**Methodology**

All patients received comprehensive preoperative evaluation, which included assessment of glycaemic status. Patients were given one of the following wound healing strategies based on the type of wound and the type of surgery: - Regular saline dressing - Advanced wound dressing (hydrocolloid/hydrogel) - Negative pressure wound therapy

Postoperative wounds were assessed regularly for healing progress, signs of infection, graft or flap viability, and complications. Patients were followed until complete wound healing.

**Results**

**Table 1: Demographic Profile**

Parameter	Number (n=70)	Percentage
Male	42	60%
Female	28	40%

**Table 2: Type of Wound Healing Strategy Used**

Strategy	Number of Patients	Percentage
Conventional dressing	28	40%
Advanced dressing	24	34.3%
Negative pressure therapy	18	25.7%

**Table 3: Wound Healing Outcomes**

Outcome	Conventional	Advanced	NPWT
Average healing time (weeks)	8–10	6–8	4–6
Infection rate	25%	12.5%	5.5%
Graft/Flap failure	14%	8%	5%

Patients managed with advanced wound care and negative pressure therapy demonstrated faster healing and fewer complications.

**Discussion**

The results of this study emphasise the intricacy of wound healing in diabetic individuals and the necessity for customised wound treatment approaches. Delayed wound healing associated with traditional dressings aligns with prior research highlighting the adverse effects of hyperglycemia on tissue repair processes [10,11].

Advanced wound dressings create a moist environment for the wound and help with autolytic debridement, which leads to better healing results [12,13]. Negative pressure wound care yielded the most advantageous outcomes in this investigation, with decreased infection rates and enhanced graft or flap survival. These results are consistent with existing evidence endorsing the application of NPWT in diabetic and post-surgical wounds [14–16].

Effective glycaemic control, precise surgical technique, and suitable postoperative wound management are essential for enhancing outcomes in

diabetic patients having plastic surgery [17]. The lower complication rates shown with advanced techniques show how they can help patients stay in the hospital for less time and be happier with their care [18,19].

The study's limitations encompass a very small sample size and a single-center approach. Additional multicentric studies employing randomised designs are necessary to formulate standardised wound care strategies for diabetes individuals [20–25].

**Conclusion**

Wound healing in diabetes patients receiving plastic surgery continues to be difficult. Negative pressure wound therapy and other advanced wound healing techniques make healing much better and lower the risk of problems after surgery. Diabetic patients should have individualised wound care planning as a key aspect of their surgical management.

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