

# From Cancer to Closure: Exploring Ultrasound in Post-Surgical Repair

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## Purpose

Chronic wound healing in patients with different comorbidities and/or the geriatric population there is a concern for an increased risk of infection, delayed closure, and functional limitations. Evidence suggests that non-contact low-frequency ultrasound therapy may enhance healing by stimulating cellular activity, reducing bioburden, and promoting granulation tissue formation. This case describes the use of this modality to support healing in a large post- excisional wound in an older adult.

## Methods

An elderly adult female with a medical history significant for chronic comorbid conditions presented with a nonhealing ulcer of the lower leg that was subsequently diagnosed as squamous cell carcinoma. Surgical excision resulted in a sizable soft-tissue defect measuring 4.5 × 5.0 × 0.3 cm on her anterior distal leg. To help assist in proper healing, non-contact low-frequency ultrasound therapy\* was initiated as an adjunct to standard wound care. Treatments were provided which included a 7-week period of ultrasound\* therapy use. Wound progression was assessed clinically at routine visits, evaluating changes in size, tissue quality, granulation formation, epithelialization, and overall tolerance to therapy. By her final follow-up visit, the wound had fully healed, demonstrating complete epithelialization without complications and completely pain free.

## Literature Review

Non-contact low-frequency ultrasound (NLFU) has been studied for chronic and post-surgical wounds and is shown to accelerate healing by promoting granulation tissue formation, angiogenesis, and reduction of bacterial load. Ultrasound-assisted debridement and therapy has demonstrated improvements in cellular proliferation and decreased bacterial burden in diabetic foot ulcers (1). Randomized controlled trials in venous leg ulcers have shown that NLFU combined with standard care leads to faster wound-size reduction and improved pain outcomes compared to standard care alone without the use of NLFU (2, 3). A systematic review of low-frequency ultrasound debridement across multiple chronic wound types supports its efficacy in enhancing wound healing, although study heterogeneity and small sample sizes limit generalizability (4). A recent policy review further highlights the clinical potential of NLFU devices while noting gaps in high-quality evidence and the need for additional studies (5). Collectively, these studies provide a rationale for using NLFU in post-surgical wound management, supporting its application in the present case.

## Results and Discussion

Throughout the treatment course, the wound demonstrated gradual and consistent improvement, transitioning from a large post-surgical defect to full closure. Increased granulation tissue formation and epithelial advancement were observed with each evaluation. The patients pain and return to activity dramatically increased over the course of the treatment with the patient being completely pain free after three weeks of the ultrasound therapy. At the final visit, the wound had completely healed, with minimal scar formation and near-restoration of normal skin pigmentation. No complications, such as infection, were observed. The patient tolerated therapy well, with no reported discomfort during treatments.

This case illustrates the potential value of non-contact low-frequency ultrasound therapy as an adjunctive modality for managing complex post-surgical wounds. The observed improvements align with previously published findings demonstrating enhanced healing through mechanical stimulation, improved perfusion, and bioburden reduction. The favorable cosmetic and pain free outcome (including return of normal skin pigmentation) suggests benefits beyond functional closure. These findings support the consideration of this technology in similar clinical scenarios where accelerated, high-quality healing is desired.

## References

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## Disclaimer

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First Office Visit



2 Day Post Op



2 Week Post Op



7 Week Post Op



11 Week Post Op

