

A Simple Alternative for Intralesional Cryosurgery of Keloids and Hypertrophic Scars Using a Disposable Infusion Set

Ece Gokyayla, MD; Beyza Ture Avci, MD

Intralesional cryosurgery is effective for treating dermatologic conditions such as keloids and hypertrophic scars but is limited by costly probes. We present a novel, practical, and economical cryogen delivery method that adapts a disposable infusion set to a standard cryospray nozzle. This adaptation simplifies the procedure, enhances accessibility, and reduces costs without compromising clinical effectiveness or patient safety.

Practice Gap

Intralesional cryosurgery is a highly effective treatment for dermatologic conditions, notably keloids and hypertrophic scars.¹ Conventional methods typically use specialized double-lumen intralesional probes or Luer lock adapters connected to hypodermic or lumbar puncture needles, allowing cryogen to flow internally to cool the probe or needle and treat the lesion via conduction.² However, specialized intralesional probes are expensive and often are difficult to obtain. Furthermore, Luer lock adapters with needles directly attached to the handle unit can be ergonomically challenging, as the procedure requires simultaneous maintenance of a perpendicular handheld position, precise needle passage through the exact center of the lesion, and protection of the surrounding perilesional healthy skin from cold injury. Consequently, these limitations restrict widespread adoption, necessitating simpler, more accessible, and cost-effective alternatives. Herein, we present a novel, practical, and economical cryogen delivery method that adapts a disposable infusion set to a standard cryospray nozzle.

The Technique

This technique involves detaching the infusion set tubing and securely connecting it to the cryospray nozzle (Figure 1). Brief activation of the cryospray to constrict the nozzle or a small incision in the tubing may be required to

ensure a tight fit, which can be secured with medical tape to maintain consistent cryogen flow. Local anesthesia is administered directly into and around the lesion, particularly translesionally for keloids, to avoid unnecessary trauma to the surrounding healthy skin, which could trigger further keloid formation. A needle is inserted through the lesion with the tip extending beyond its distal boundary, ensuring the tip remains outside the lesion during cryogen application to prevent cryoinsufflation. If necessary, gentle bending of the needle helps ensure optimal cryogen distribution within the lesion (Figures 2A and 2B). However, this may slightly reduce flow and extend freezing duration; therefore, bending the needle should be performed cautiously and is specifically recommended for effectively treating lesions on curved anatomic sites (eg, the auricle of the ear) to optimize freezing and protect surrounding tissues.

During initial cryogen release, covering the needle tip with gauze prevents aerosolization of biological debris,

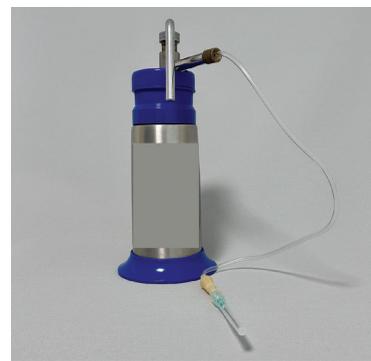


FIGURE 1. Disposable infusion set adapted to a standard cryospray device, illustrating secure attachment ensuring continuous cryogen flow.

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Dr. Gokyayla is from the Department of Dermatology and Venereology, Ege University Faculty of Medicine, Turkey. Dr. Ture Avci is from the Department of Dermatology and Venereology, Izmir City Hospital, Turkey.

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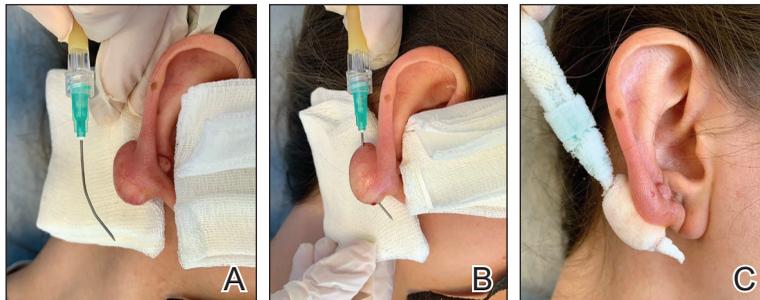
Correspondence: Ece Gokyayla, MD (ecegokyayla@gmail.com).

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FIGURE 2. Sequential demonstration of the intralesional cryosurgery technique on an ear keloid. A, Gentle needle bending for optimal central cryogen distribution. B, Translesional needle insertion. C, Effective cryogen delivery with protective gauze in place to prevent inadvertent cold injury.



while placing a wooden tongue depressor between the needle tip and the patient's skin prevents inadvertent cold injury. After cryogen flow is initiated, the lesion begins to freeze at both the needle entry and exit points, forming what is referred to as ice balls. Over time, typically within several seconds to a few minutes depending on lesion size and tissue characteristics, these ice balls merge centrally, forming a single ice ball encompassing the entire lesion (Figure 2C). Cryogen flow should be maintained during a single application until the unified ice ball appearance is achieved, confirming effective cooling.

Practice Implications

Studies have consistently shown that intralesional cryosurgery is associated with a reduction in the size and symptoms of hypertrophic scars and keloids.^{1,2} Multimodal treatment approaches, including intralesional methods, are especially valued for their targeted efficacy and minimal adverse

effects. Our simplified method offers practical economic advantages, making it highly suitable for broad adoption across diverse clinical settings, particularly those that are resource limited. Clinicians can safely and effectively utilize this technique without specialized or costly equipment, considerably enhancing clinical efficiency and accessibility. The straightforwardness of this method also facilitates the training of medical personnel, enabling rapid integration into clinical practice and the flexibility to treat various lesion types and sizes effectively.

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