



Case Letter

Preservation of hair density and orientation in a large scalp defect of a female patient using a novel intraoperative skin relaxation device



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Dear Editor,

The negative psychosocial impact of hair loss, regardless of the cause, may be greater in women than men (Davis and Callender, 2018). Wound closure involving flaps, grafts, and extensive undermining can result in postoperative hair reorientation, alopecia, and numbness. Linear closures are preferable to decrease postoperative complications and provide optimal cosmesis.

We present a case of a large scalp defect in a female patient in which we avoided flap, graft, and undermining using a novel intraoperative skin relaxation (ISR) device (SUTUREGARD ISR, SUTUREGARD Medical, Inc.). This method has been shown to reduce scalp wound tension by 65% within 30 min (Lear et al., 2019).

A 61-year-old female patient presented for Mohs surgery of a basal cell carcinoma on the right scalp. The final defect (4.2 × 7.6 cm) had a large bite (1 cm) retention suture placed across the central width of the defect and threaded through the ISR. The wound was reduced to a width of 0.5 cm with 25.0 N of tension without undermining (Fig. 1). The patient required two stages of Mohs surgery, resulting in approximately 120 minutes of skin stretching. After that time, tension was reduced to 8.5 N (66% reduction). The ISR was removed, and linear wound closure was accomplished using 3-0 polyglycolic acid sutures and staples. At 2 weeks, the staples were removed, and the wound had healed without significant discomfort or complications. (Fig. 2).

Large rotation flaps require a greater than a 4:1 ratio of length-to-width to gain adequate tissue motion and require wide undermining, which frequently leads to long-term numbness, distortion of hair orientation, and/or transient or sometimes permanent alopecia. Skin grafts often sacrifice adequate tissue matching and leave areas of hair loss. Hair conservation is an important reconstructive consideration, especially in female patients (Davis and Callender, 2018). Regardless of the alopecia type, the quality-of-life scores for women with alopecia were consistently lower compared with those of their male counterparts in recent studies (Davis and Callender, 2018).

Linear closure is the preferred closure method for most wounds owing to its cost effectiveness, decreased complications, and ability to yield superior cosmetic outcomes. In addition, if surgeons can

avoid extensive undermining, peripheral hair follicles can be spared potential damage. Skin relaxation without undermining has been shown to provide twice the tension relief of undermining with far fewer complications, including edge necrosis, wound dehiscence, and seroma formation (Melis et al., 2001).

Some surgeons employ a central far-near-near-far (pulley) suture to achieve a similar relaxation as with the ISR technique. However, use of a pulley suture for closure of scalp wounds >2 cm in width is prone to wound edge necrosis (Malone et al., 2017). The ISR disperses pressure away from the wound edge to prevent skin tearing (Lear et al., 2019). Towel clamps are another means of closure but are associated with excessive tissue damage (Liu et al., 2004).

We were able to achieve successful linear closure without undermining, thus minimizing compromise to the integrity of the skin or surrounding hair. We encourage this as a viable option for similar cases in which linear closure is desired but made difficult by the amount of tension on the defect.

Conflict of Interest

None.

Funding

None.

Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

Financial Disclosures

William Lear is a co-founder and shareholder in SUTUREGAR Medical, Inc.

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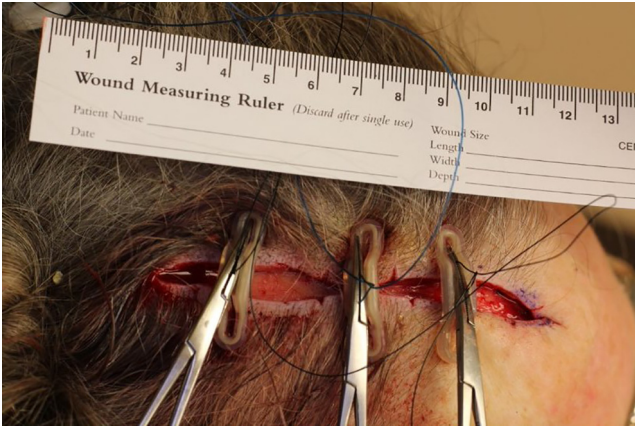


Fig. 1. Wound incrementally closed with three SUTUREGARD ISR devices.



Fig. 2. Well-healed wound at 2 weeks without pressure injury or damage to surrounding hair.

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