Use of a novel suture retention device to protect skin edges while using pulley suture technique for high-tension wound closure

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Key words: high-tension wound closure; primary wound closure; pulley suture; scalp wounds; suture retention device; SUTUREGARD.

SURGICAL CHALLENGE

The far-near near-far ("pulley") suture technique is commonly used to provide a mechanical advantage during primary closure of high-tension wounds. However, if the 2 suture segments are placed in the same plane, there is a significant chance of tissue strangulation and wound edge necrosis, particularly if the lesion size is greater than 2.0 cm.[1] Further, the "near-near" segment places significant pressure on the thin suture, which can lead to tissue erosion and tearing. Disruption of wound edges from the pulley suture increases the chance of wound complications such as necrosis and dehiscence.

SOLUTION

The SUTUREGARD device (SUTUREGARD Medical, Portland, OR) can be used to protect skin edges from the pulley suture near-near segment when attempting to perform a primary closure in a high-tension area. The bridge design of the SUTUREGARD device has a rigid, raised center and 2 flexible skin contact portions to distribute force over a larger surface area, thus allowing more force to be applied to the wound so as to stress-relax it.[2] Use of the SUTUREGARD device with the pulley suture (Figs 1 and 2) allows for a mechanical advantage of the pulley suture while limiting direct tissue damage during stress relaxation. Once adequate stress relaxation has been achieved within 30 to 60 minutes, the device and pulley suture are removed (Fig 3). The wound is closed in standard linear fashion with routine dressings. This technique is limited to areas where the viscoelastic properties of the skin allow high-tension suturing and may help prevent the need for flaps or grafts.

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Funding sources: None.
Disclosure: Dr Lear is a shareholder for the SUTUREGARD device (SUTUREGARD Medical, Portland, OR). Drs Ferrell and Fancher have no conflicts to disclose.
IRB approval status: This study was exempt from institutional review board approval at Good Samaritan Regional Medical Center.

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J Am Acad Dermatol 2020;83:e113-5.
0190-9622/$36.00

https://doi.org/10.1016/j.jaad.2019.04.030

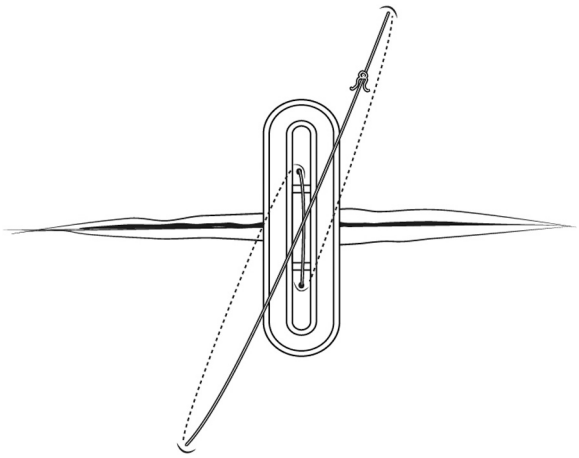

Fig 1. Demonstration of pulley suture with the SUTUREGARD device for primary wound closure.

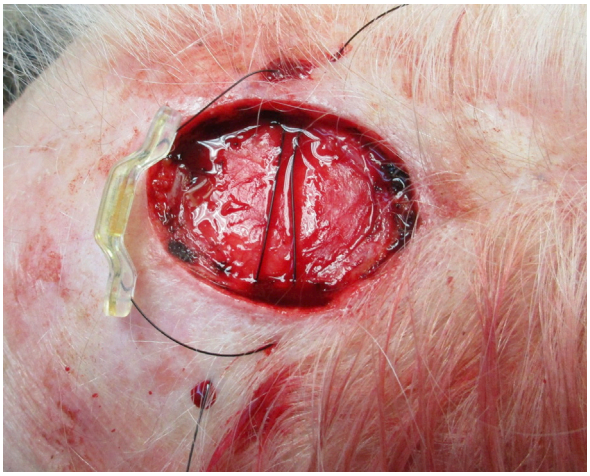

Fig 2. Demonstration of pulley suture with the SUTUREGARD device in place before suture tightening for a high-tension scalp wound.

Fig 3. Primary wound closure on the scalp by using a pulley suture with the SUTUREGARD device.

REFERENCES

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