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# Set-back versus buried vertical mattress suturing: Results of a randomized blinded trial

Audrey S. Wang, MD,<sup>a,b</sup> Rebecca Kleinerman, MD,<sup>c</sup> April W. Armstrong, MD, MPH,<sup>d</sup>  
Sarah Fitzmaurice, MD,<sup>a</sup> Anabella Pascucci, MD,<sup>a</sup> Smita Awasthi, MD,<sup>a</sup> Mondhipa Ratnarathorn, MD,<sup>a</sup>  
Raja Sivamani, MD,<sup>a</sup> Thomas H. King, MD,<sup>a,b</sup> and Daniel B. Eisen, MD<sup>a</sup>  
*Sacramento and Mather, California; New York, New York; and Aurora, Colorado*

**Background:** The set-back suture, an absorbable dermal suturing technique, purportedly improves wound eversion and cosmetic outcomes.

**Objective:** We sought to conduct a split-wound, prospective, randomized study to compare the cosmetic outcome and wound eversion achieved with the set-back suture and the buried vertical mattress suture (BVMS).

**Methods:** A total of 46 surgical elliptical wounds were randomized to subcuticular closure with the set-back suture on half and the BVMS on the other. Maximum eversion height and width were measured immediately postoperatively. At 3 months, 2 blinded observers evaluated each scar using a 7-point Likert physician global scar assessment scale. Subjects and observers also completed the validated Patient and Observer Scar Assessment Scale, where a score of 6 represents normal-appearing skin and 60 represents worst imaginable scar.

**Results:** In all, 42 subjects completed the study. The set-back suture provided statistically significant wound eversion. On the Likert scale, observers rated the set-back suture side 1 point better than the BVMS side. Both patient and observer total Patient and Observer Scar Assessment Scale scores were significantly lower for the set-back suture side (subject mean  $13.0 \pm 8.7$  vs  $16.2 \pm 12.0$  [ $P = .039$ ]; observer mean  $24.5 \pm 10.4$  vs  $27.7 \pm 13.6$  [ $P = .028$ ], respectively).

**Limitations:** Single institution experience and relatively short follow-up are limitations.

**Conclusion:** The set-back suture provides superior wound eversion and better cosmetic outcomes than the BVMS. (J Am Acad Dermatol 2015;72:674-80.)

**Key words:** buried vertical mattress suture; cutaneous surgery; scar evaluation; set-back suture; subcuticular closure technique; wound eversion.

In 2010, Kantor<sup>1</sup> described a method of absorbable dermal suturing known as the set-back suture. This technique was also previously mentioned in the context of scar revision with hypereversion.<sup>2</sup> In contrast with other methods, the set-back suture does not enter or exit from the wound edge. Instead, it both enters and exits from

the undermined surface of the superficial subcutis parallel to the skin surface in a vertical orientation (Fig 1, A). Kantor<sup>1</sup> identified the following advantages of this method: ease of use, dramatic wound eversion, reduced risk of spitting suture material, and minimization of dead space. An accompanying editorial response from a respected senior surgeon

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From the Department of Dermatology, University of California—Davis, Sacramento<sup>a</sup>; Department of Dermatology, Department of Veterans Affairs, Northern California Healthcare System, Mather<sup>b</sup>; Schweiger Dermatology, New York<sup>c</sup>; and Department of Dermatology, University of Colorado—Denver, Aurora.<sup>d</sup>

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Reprint requests: Daniel B. Eisen, MD, Department of Dermatology, University of California—Davis Health System, 3301 C St, Suite 1400, Sacramento, CA 95816. E-mail: [dbeisen@ucdavis.edu](mailto:dbeisen@ucdavis.edu).

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and scholar was very favorable, but no efficacy or safety data were provided.<sup>3</sup>

We used a split-wound/split-scar model to compare the set-back suture with the current gold standard for subcuticular closure: the buried vertical mattress suture (BVMS) (Fig 1, B), which was originally described by Zitelli and Moy<sup>4</sup> in 1989.

A split-scar model has been used in the past to assess cuticular suturing techniques.<sup>5</sup> Comparing 2 different interventions within the same wound is an elegant way of minimizing uncontrolled confounders and reducing the number of patients necessary to detect a statistically significant difference in outcome measures. In our study, we primarily evaluated the cosmetic outcomes of the scars 3 months after surgery. Secondary outcomes included the degree of wound eversion achieved immediately postoperatively and the incidence of spitting sutures. Other purported advantages of the set-back suture regarding reduction in dead space and ease of learning were thought to be more difficult to investigate and not among our objectives.

## METHODS

### Study design, registration, training, and ethical consent

In this prospective, randomized, evaluator-blinded, registered ([Clinicaltrials.gov](https://clinicaltrials.gov) identifier: NCT01773447) trial, patients were continuously enrolled between November 2011 and March 2012. Ethical approval was obtained through the University of California–Davis Institutional Review Board before study commencement, and all patients provided verbal and written consent to enrollment. We used a split-wound/split-scar model to minimize the number of uncontrolled variables. All study surgeons (attending physician, procedural fellow, and dermatology residents) were trained with both suturing techniques by the senior author before study recruitment during a pig's foot lab.

### Patient eligibility

Inclusion criteria for study enrollment included age 18 years or older and presence of surgical elliptical wounds with predicted closure lengths of at least 3 cm. Exclusion criteria included incarceration, pregnancy, inability to return for 3-month

follow-up visit, inability to understand the study or risks involved, inability to read or speak English, and skin suspected to be less than 3 mm in thickness including both dermis and epidermis (because of concern that the thin tissue would not support subcutaneous sutures).

## CAPSULE SUMMARY

- The set-back suture is an absorbable dermal suturing technique.
- Compared with the buried vertical mattress suture, the set-back suture provides superior wound eversion immediately postoperatively and better cosmetic outcomes at 3-month follow-up.
- The set-back suture should be considered when performing subcuticular closures for cutaneous surgery.

## Randomization, allocation concealment, and interventions

Surgical elliptical wounds (after excision or Mohs micrographic surgery) were divided in half and labeled as “A” and “B,” with “A” by convention always superior or on the left side from the surgeon's perspective and “B” the opposite of “A.” A randomization list was generated before enrollment from a freely available World Wide Web service ([random.org](http://random.org)). The list was maintained in an opaque folder kept

separately from those involved in recruitment, intervention, and assessment. After labeling, a study researcher would consult the list, and only the surgeon would be informed of the allocation assignment. The subject was blinded to the assignment. Before suture placement, wound edges were moderately undermined to aid in placement of the subcuticular sutures, and any residual bevels were excised. The appropriate half would then receive either closure with the set-back suture<sup>1</sup> or the BVMS<sup>4</sup> and the other side the opposite. Closure always occurred on side “A” first. Sutures were placed on both sides of the midpoint of the wound (not directly at the midpoint) to restrict the influence of both suturing methods to their respective sides. Polyglactin 910 was used as the subcuticular suture material of choice, and adhesive strips were used in lieu of cuticular sutures, except where protocol violations occurred (see “Results” section). We applied adhesive strips to negate confounding caused by track mark formation that may occur with cuticular sutures. The size of the suture material was determined by the individual surgeon and varied by location but was the same for both sides of the wound.

## Assessments

We evaluated our primary outcome of cosmetic appearance of the scar 3 months after surgery. Because differences in surgical interventions tend

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