

# The effect of suture spacing on patient perception of surgical skill

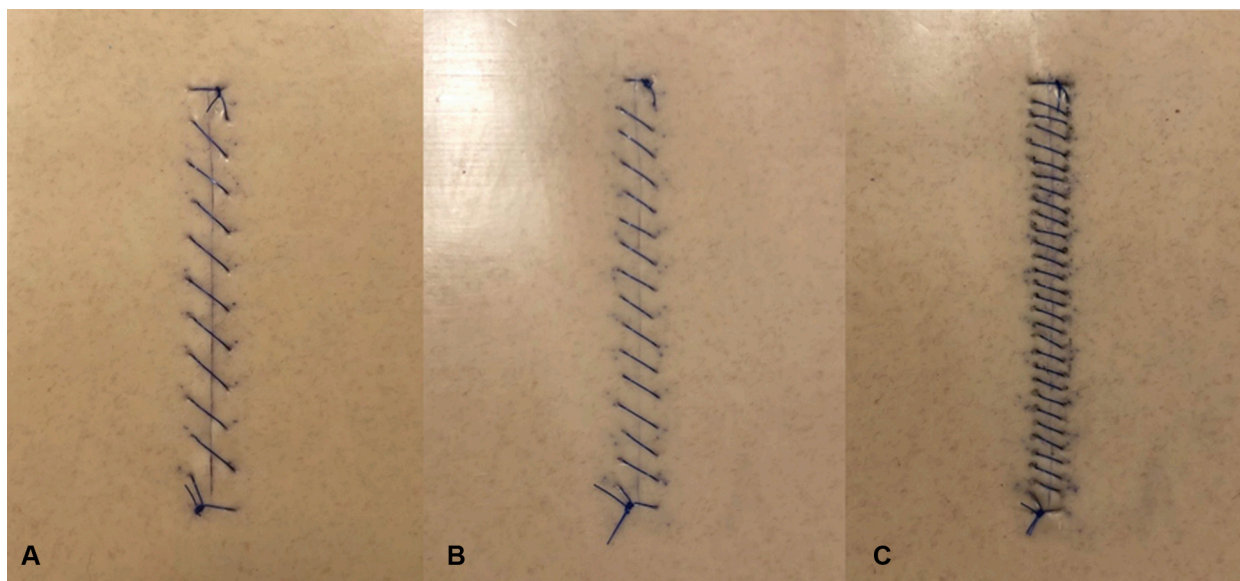


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With regard to epidermal wound closure, dermatologic surgeons vary widely in their techniques for approximation of the epidermis and superficial dermis. Split scar studies comparing epidermal suture spacing,<sup>1,2</sup> tissue adhesives in comparison to epidermal sutures,<sup>3</sup> and dermal sutures only compared to layered repairs<sup>4</sup> have all failed to show significant long-term differences in surgical scar outcomes. However, many dermatologic surgeons continue to use traditional layered wound closure techniques using both dermal and epidermal sutures.

The spacing of epidermal sutures can vary greatly among surgeons. Narrowly spaced sutures are more resource intensive and time consuming than widely spaced sutures and may not result in superior outcomes based on published studies.<sup>1,2</sup> Patient perception, however, is an important factor in the patient experience, so we sought to study whether more narrowly spaced epidermal sutures could be interpreted as better or more skillful by patients. We performed a survey study on patients undergoing Mohs micrographic surgery to measure the effect, if any, of 2-mm, 4-mm, and 6-mm



**Fig 1.** 6-mm, 4-mm and 2-mm epidermal suture spacing on simulation skin.

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epidermal suture spacing on patients' perceptions of surgical skill.

Before reconstruction, patients were asked to evaluate a series of wound closures performed on synthetic skin. Surveys contained 3 standardized photographs (randomized order) of wound closures labeled as *Surgeon A* (6-mm spacing between running epidermal sutures), *Surgeon B* (4-mm spacing), and *Surgeon C* (2-mm spacing) (Fig 1, A-C). Patients were asked to rank each repair on a scale of 1 to 10 and to choose which of the 3 surgeons had the greatest technical skill and least technical skill. Apart from suture spacing, the 3 repairs were otherwise identical.

Categorical responses were summarized by using frequencies and percentages, and skill level was summarized by using the median and interquartile range. Kendall-Wei ranking methods<sup>5</sup> were used to determine the ordering of surgeons based on the recorded skill score.

The basic demographics are summarized in Table I, and the results are presented in Table II.

Our data show that patients ranked a closure with 2-mm-spaced sutures significantly lower than either the 4-mm ( $P = .005$ ) or 6-mm spacing ( $P = .012$ ), with no appreciable difference in ranking between the 2 wider spacings. This was further supported by a plurality of patients (48%) choosing the surgeon with 2-mm spacing as the least skilled among the 3.

These findings were consistent when stratified among different age groups and history of prior sutures, but interestingly, results varied when

compared between the sexes. Women were significantly more likely to rate the surgeon with 2-mm spacing as the least skilled, whereas men did not show any significant preferences among surgeons.

Given our data and results from the prior studies mentioned, surgeons performing traditional layered cutaneous repairs may consider using more widely spaced epidermal sutures. Narrowly spaced sutures are more time consuming, require more suture material, and can be perceived as less skillful by patients. Only 3 variants of suture spacing were examined in this study, but future studies could include more patterns to determine the optimally perceived suture spacing.

### CAPSULE SUMMARY

- To our knowledge, our study is the first one to evaluate the effect of suture spacing on patients' perceptions of surgeons' skills.
- Our results suggest that surgeons performing traditional layered cutaneous repairs may consider using more widely spaced epidermal sutures (4 or 6 mm rather than 2 mm).

### REFERENCES

1. Sklar LR, Pourang A, Armstrong AW, Dhaliwal SK, Sivamani RK, Eisen DB. comparison of running cutaneous suture spacing during linear wound closures and the effect on wound cosmesis of the face and neck: a randomized clinical trial. *JAMA Dermatol*. 2019;155(3):321-326.
2. Stoecker A, Blattner CM, Howerter S, Fancher W, Young J, Lear W. Effect of simple interrupted suture spacing on aesthetic and functional outcomes of skin closures. *J Cutan Med Surg*. 2019;23(6):580-585.
3. Zhuang AR, Beroukhim K, Armstrong AW, Sivamani RK, Eisen DB. Comparison of 2-octylcyanoacrylate versus 5-0 fast-absorbing gut during linear wound closures and the effect on wound cosmesis. *Dermatol Surg*. 2020;46(5):628-634.
4. Joo JS, Zhuang AR, Tchanque-Fossuo C, et al. Dermal suture only versus layered closure: a randomized, split wound comparative effectiveness trial. *J Am Acad Dermatol*. 2019; 81(6):1346-1352.
5. Kendall MG. Further contributions to the theory of paired comparisons. *Biometrics*. 1955;11(1):43-62.

**Table I.** Patient demographics

Characteristics	Value, n
Sex	
Female	40
Male	60
Age, y	
18-30	1
31-40	2
41-50	1
51-60	11
61-70	34
71-80	33
81+	18
Prior sutures	
No	11
Yes	89

**Table II.** Results

Results	Median (IQR)	Kendall-Wei ranking
Technical skill scores		
Surgeon A (6 mm)	8 (6-10)	0.634
Surgeon B (4 mm)	8 (6-9)	0.617
Surgeon C (2 mm)	6 (4-9)	0.466
Chosen most skilled, %		
Surgeon A (6 mm)	47 (35-59)	
Surgeon B (4 mm)	32 (22-44)	
Surgeon C (2 mm)	21 (13-33)	
Chosen least skilled, %		
Surgeon A (6 mm)	29 (19-41)	
Surgeon B (4 mm)	23 (14-35)	
Surgeon C (2 mm)	48 (36-60)	

IQR, Interquartile range.