

# How to Optimize Epidermal Approximation During Wound Suturing Using a Smartphone Camera

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Precise wound approximation during cutaneous suturing is of vital importance for optimal closure and long-term scar outcomes. Utilizing smartphone camera technology as a quality-control checkpoint for objective evaluation allows the dermatologic surgeon to scrutinize the wound edges and refine their surgical technique to improve scar outcomes.

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## Practice Gap

Precise wound approximation during cutaneous suturing is of vital importance for optimal closure and long-term scar outcomes. Although buried dermal sutures achieve wound-edge approximation and eversion, meticulous placement of epidermal sutures allows for fine-tuning of the wound edges through epidermal approximation, eversion, and the correction of minor height discrepancies (step-offs).

Several percutaneous suture techniques and materials are available to dermatologic surgeons. However, precise, gap- and tension-free approximation of the wound edges is desired for prompt re-epithelialization and a barely visible scar.<sup>1,2</sup>

Epidermal sutures should be placed under minimal tension to align the papillary dermis and epidermis precisely. The dermatologic surgeon can evaluate the effectiveness of their suturing technique by carefully examining the closure for visibility of the bilateral wound edges, which should show equally if approximation is precise; small gaps between the wound edges

(undesired); or dermal bleeding, which is a manifestation of inaccurate approximation.

Advances in smartphone camera technology have led to high-quality photography in a variety of settings. Although smartphone photography often is used for documentation purposes in health care, we recommend incorporating it as a quality-control checkpoint for objective evaluation, allowing the dermatologic surgeon to scrutinize the wound edges and refine their surgical technique to improve scar outcomes.

## The Technique

After suturing the wound closed, we routinely use a 12-megapixel smartphone camera (up to 2× optical zoom) to photograph the closed wound at 1× or 2× magnification to capture more details and use the zoom function to further evaluate the wound edges close-up (Figure). In any area where inadequate epidermal approximation is noted on the photograph, an additional stitch can be placed. Photography can be repeated until ideal reapproximation occurs.

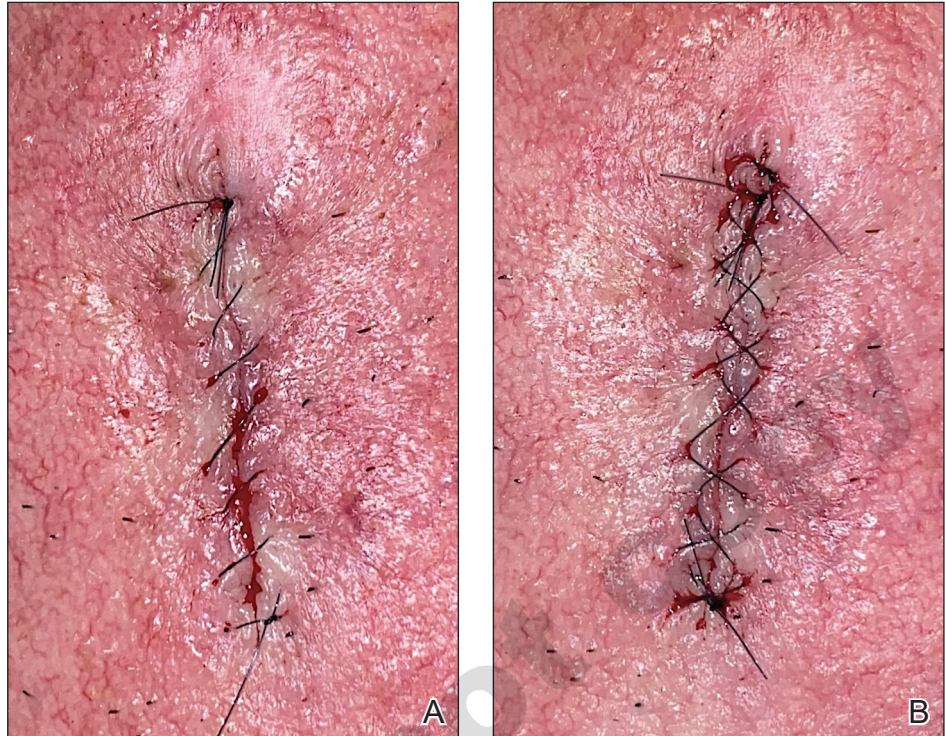
## Practice Implications

Most smartphones released in recent years have a 12-megapixel camera, making them more easily accessible than surgical loupes. Additionally, surgical loupes are expensive, come with a learning curve, and can be intimidating to new or inexperienced surgeons or dermatology residents. Because virtually every dermatologic

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Postoperative wound edge with 5-0 nylon sutures photographed using a 12-megapixel smartphone camera. A, The inferior aspect of the wound was not approximated perfectly, as evidenced by a thin line of blood between the 2 edges. B, Placement of a cross-stitch resulted in perfect epidermal approximation and eversion.



surgeon has access to a smartphone and snapping an image takes no more than a few seconds, we believe this technique is a valuable new self-assessment tool for dermatologic surgeons. It may be particularly valuable to dermatology residents and new/inexperienced surgeons looking to improve their techniques and scar outcomes.

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