The occasional vertical mattress suture

Gordon Brock, MD, FCFP, FRRMS
Centre de santé Témiscaming, Témiscaming, Que.

Fanyi Meng, MD
Department of Plastic and Reconstructive Surgery, McGill University Health Centre, Montréal, Que.

Correspondence to: Gordon Brock, geebee@ontera.net

This article has been peer reviewed.

INTRODUCTION

"Suturing" (from the Latin *sutura*, meaning "seam") is defined by Dictionary.com[1] as "a joining of the lips or edges of a wound or the like, by stitching or some similar process; a particular method for doing this; or one of the stitches or fastenings employed." Wounds have been sutured for thousands of years, and there are now several additional options for skin closure, such as tape, glue, suturing and staples.[2]

For many physicians, the gold standard and the commonest technique is still suturing with needle and thread. There is a bewildering array of needle types and sizes, thread materials, thread diameters and suturing techniques, although some suturing techniques (i.e., the chest drainage tube knot and the purse-spring suture) are relatively specialized. A repertoire of 5 or 6 suturing techniques is probably the most that most of us need and can reliably use for the wounds that we see in rural areas.

During the repair of any wound, the edges must be approximated to eliminate any dead space that may accumulate a hematoma or serve as a site of bacterial infection, and the skin edges should be everted, leaving a slight elevation of the wound edge above the skin line (Fig. 1). This eversion is necessary to allow for some scar contraction during the normal healing process and thus avoidance of a visible scar.[3]

In this article, we discuss the use and technique of the vertical mattress suture.

Like most suturing techniques, the vertical mattress suture has advantages and disadvantages and wounds for which it is best suited (Box 1). It is designed for use when the skin edges are likely to be difficult to evert (Fig. 2).[3,4] In addition, with only 1 kind of suture, the vertical mattress suture will:

- Evert the wound edges
- Close shallow dead space
- Give — by incorporating a (relatively) large amount of tissue into the thread loops — a better distribution of wound tension, especially in areas of high skin tension, such as the back and thorax.

It can be used alone to close a wound or in conjunction with simple interrupted sutures.

The disadvantage of the vertical mattress suture is that it can leave "railroad-track" scars. It should not be used on the face or neck.

TECHNIQUE OF INSERTION

The technique is best described as "far–far, near–near" (Fig. 3). Suitable YouTube videos are available.[5,6]

- Begin *far*. Start as you would for a simple interrupted suture. Insert the needle perpendicularly into the skin about 0.5–1 cm from the wound edge. Take a large bite of tissue and travel through the subcutaneous tissue under the dermis to emerge on the opposite edge of the wound, the same distance away from the edge as on the first side of the wound.
- Release the needle from the needle holder and reverse it in the needle driver. Take a *near* bite 1–2 mm away from the wound edge and

© 2018 Society of Rural Physicians of Canada

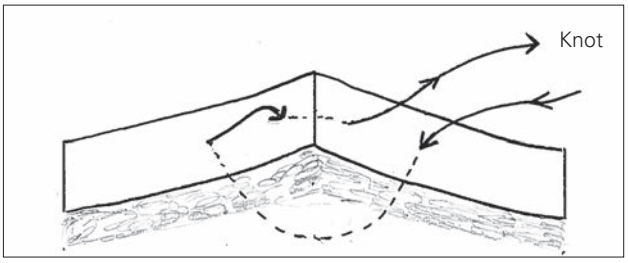


Fig. 1. During the repair of any wound, the skin edges should be everted, leaving a slight elevation of the wound edge above the skin line.

Box 1: Wound selection for the vertical mattress suture

Wounds well-suited

- Wounds in areas of lax skin (e.g., elbow, dorsum of hand), where there is a tendency for the skin edges to fall into the wound
- Wounds in concave areas
- Wounds that are not deep enough to allow insertion of separate absorbable deep sutures but still require some deep closure

Wounds not suited

Wounds on the face and neck

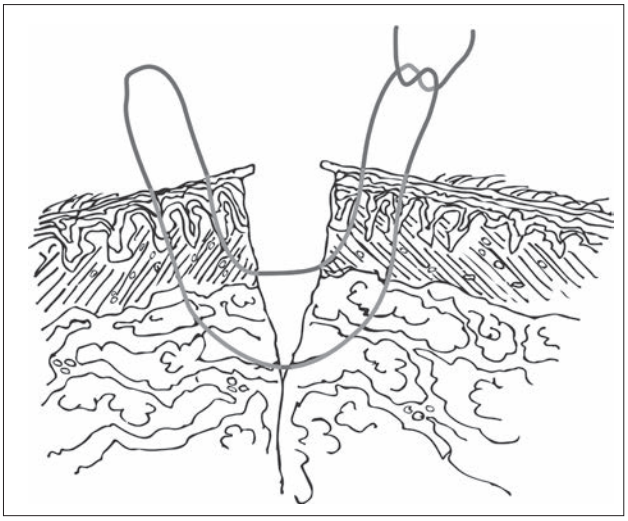


Fig. 2. The vertical mattress suture is designed for use when the skin edges are likely to be difficult to evert.

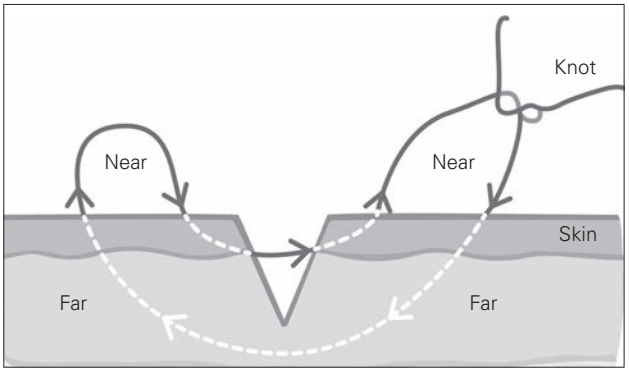


Fig. 3. "Far–far, near–near" vertical mattress suture technique.

emerge on the opposite side of the wound, again the same distance away from the wound edge as on the opposite side. Ideally, this near bite should travel through the deep dermis to allow adequate approximation of the skin edges. Assure proper wound edge eversion with the near sutures. It is better to err on the side of too much rather than too little edge eversion. You are now back on the side from which you started.

- Tie the ends on the same side from which you started. The knot should be snug, but beware of excess tension on the near–near sutures, as this can lead to tearing of the skin edges, necrosis or excess eversion.[4,7]

Symmetric placement of both the far–far and near–near sutures is of great importance, and some meticulousness here will pay great dividends. The 2 loops must be placed at equal depth and equidistant from the wound edges; otherwise, a wound shelf will be created, which can lead to poor wound healing and a subsequent scar.[4]

One can use a combination of simple interrupted sutures and mattress sutures to close the wound. With a gaping wound, it is sometimes handy to insert 1 or 2 vertical mattress sutures to anchor the wound and relieve the skin tension, and then insert simple interrupted sutures in-between for the remainder of the wound. Also, some physicians put the near–near sutures in first as a matter of personal preference.

SUTURE REMOVAL

It is a little difficult to be dogmatic on exactly when to remove the sutures, as it depends on several factors, such as 1) patient age (sutures should be left in longer in older patients), healing ability and type of skin, 2) location of the wound (e.g., abdomen v. lateral chest wound, flexural surface v. nonflexural surface), 3) amount of wound tension present initially and 4) whether other sutures, such as simple interrupted sutures, were inserted as well.

Although it has been recommended that "interrupted vertical mattress sutures should be removed from most wounds in 4–6 days,"[4] this seems early to us and is perhaps more applicable for vertical mattress sutures in wounds sutured with a combination of vertical mattress and simple interrupted sutures. For wounds sewn with vertical mattress sutures only, we recommend suture removal times approximating the time for standard suture removal: 7–14 days. Use the longer interval

for wounds under greater tension or on the lower extremity. Again, there must be a balance between removing the sutures too early and risking dehiscence, or too late, risking railroad-track scars.

It is also reasonable to supplement the wound closure with taping for a few days after the sutures are removed.[2]

Once the laceration is healed (2–3 wk post-repair or 1 wk after suture removal), scar massages can be started twice per day for 5–10 minutes each time to reduce the visibility of the scar and prevent hypertrophic scarring.

REFERENCES

1. Suturing. Available: www.dictionary.com (accessed 2018 Mar. 12).
2. Brock G. The finer points of taping. *Can J Rural Med* 2018;23:52-5.
3. Trott AT. *Wounds and laceration: emergency care and closure*. 4th ed. Philadelphia: Elsevier Saunders; 2012.
4. Zuber TJ. The mattress sutures: vertical, horizontal and corner stitch. *Am Fam Physician* 2002;66:2231-6.
5. Vertical mattress sutures. Available: https://lacerationrepair.com/techniques/basic-suturing-techniques/vertical-mattress-sutures/ (accessed 2018 Mar. 12).
6. Vertical mattress suture. London (UK): MedicalSkillsCourses; 2012 Sept. 7. Available: https://www.youtube.com/watch?v=EZ2bouVfcVc (accessed 2018 Mar. 12).
7. Vertical mattress suture. Family Practice Notebook, LLC (US). Available: https://fpnotebook.com/Surgery/Procedure/VrtclMtrsStr.htm (accessed 2018 Mar. 22).

Acknowledgement: The authors thank Ardecom, Montréal, for help with the graphics.

Competing interests: None declared.

Canadian Military Families Need Your Help!



Military families move frequently and have difficulty accessing a family physician.

Join the Military Family Doctor Network Today!

For a chance to give back to those who serve and protect our country.

Call: 1-877-633-7722 x550
Email: MFDN@primacy.ca
Visit: calian.com/doctor

PRIMACY
CALIAN Health · Santé