

The occasional corner suture

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

Fanyi Meng, MD
Division 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

The goal of suturing is to ensure prompt and proper wound closure, decrease wound healing time, reduce the incidence of infection and minimize the appearance of a scar. The basic tenets of all suturing techniques are to achieve wound eversion, close a potential “dead space” and minimize further damage through careful handling of the tissues.

A repertoire of 5 or 6 suturing techniques is probably an adequate toolkit for the wounds that we see in rural regions. A previous article covered the vertical mattress suture, used to close wounds where the wound edges are difficult to evert.¹ In the current article, we discuss the corner suture.

The corner suture is used on wounds with a triangular flap (Fig. 1). It is often one of the first “advanced” suturing techniques that rural physicians learn. It is a “half-buried” suture used to approximate skin flaps, or corners, while minimizing the risk of strangulation of the vascular supply and subsequent necrosis of the tip of the flap.^{2,3}

TECHNIQUE

The basis of this technique is to place a subcuticular buried suture horizontally

through the flap or the most flap-like part of the wound. This is the most mobile part and the one least well attached to the underlying subcutaneous tissues. It is not necessarily the most proximal flap. The difference in the blood supply to a proximal skin flap versus that to a distal flap is almost negligible, as blood supply is based on a well-connected subdermal plexus. The suture knot is tied outside of the skin.

The keys to a successful corner suture closure are summarized in Box 1. Suitable YouTube videos are available^{2,3} for the typical corner suture.^{4,5}

- Use nonabsorbable, (i.e., nylon or Prolene) suture.
- It is sometimes best to imagine an imaginary “plumb line” bisecting the angle that is opposite the corner of the flap. Begin by introducing the needle percutaneously through the skin in a nonflap portion of the wound, about 1–2 mm lateral to this plumb line, 4–6 mm from the edge (Fig. 2, point A).
- Pass the needle through the dermis toward the flap.
- Use an Adson forceps, which has narrow tips and teeth to effectively grip and hold delicate tissue, to

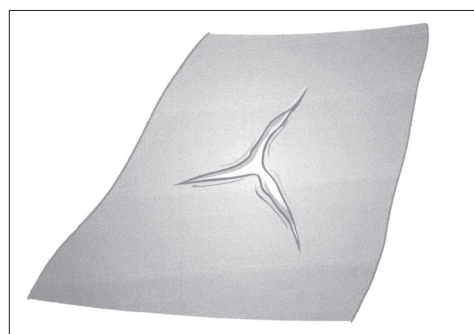


Fig. 1: The corner suture is used on wounds with a triangular flap.

Box 1: Keys to a successful corner suture

- Paying close attention to the vertical level at which the suture is passed between the wound edge and the flap, or the closure may be uneven
- Minimizing trauma to the flap by grasping the dermis, not the epidermis, using forceps
- Passing a subcuticular suture horizontally through the dermis of the flap without breaking through the surface
- Tying the suture ends with the right amount of tension (not too loose, not too tight)

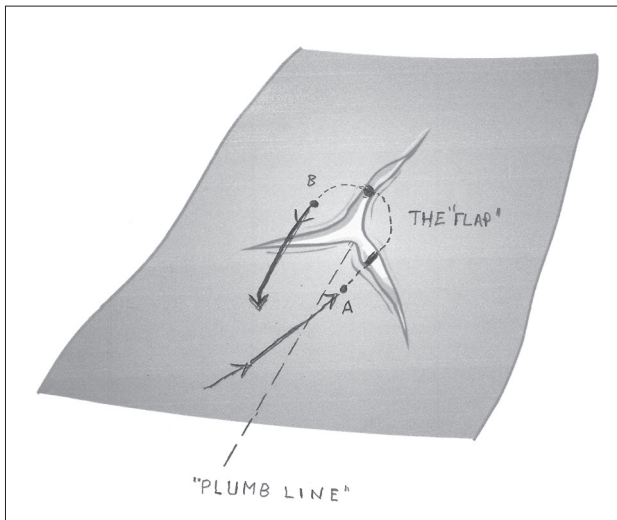


Fig. 2: The needle is introduced percutaneously through the skin in a nonflap portion of the wound, about 1–2 mm lateral to a “plumb line,” 4–6 mm from the wound edge (point A). The needle is driven horizontally through the dermal layer of the flap, to eventually emerge through the skin of the third (nonflap) portion of the wound (point B).

gently elevate the flap. One of the keys to a successful closure is minimal trauma to the flap. Thus, it is always advisable to use a forceps with teeth rather than a forceps without teeth, which will crush the already damaged tissues.

- Drive the needle horizontally — the key word is “horizontally” — through the dermis layer of the flap, ideally about 4 mm lateral to the tip of the flap, to catch the flap from one edge to the other, without penetrating the epidermis.
- Reload the needle and direct it toward the tissue edge opposite to the flap, then pass the needle through the dermis at the same vertical layer as the flap and emerge out of the epidermis 4–6 mm away from the edge, on the opposite side of the plumb line from which you entered (Fig. 2, point B).
- Tie the suture ends just snugly enough so that the corner tip is pulled gently into place. If the corner buckles, you have tied the knot too tightly. If in doubt, too loose is better than too tight (Fig. 3).
- The remaining limbs of the wound can be closed with simple interrupted sutures. To minimize ischemia of the triangular flap, do not place interrupted sutures too close to the tip.

OTHER USES

- Multiple flapped wounds: the corner suture can also be used to close X-shaped wounds.

If there are multiple flaps, the horizontal, buried portion of the suture can be passed through 2 or more flaps before emerging to be tied.

- V–Y closure: sometimes, owing to excessive blunt damage to the skin or a need to débride necrotic wound edges, there is not enough tissue to allow the flap to completely close the wound (Fig. 4). In that case, a V–Y closure can be done:
 - First, design a corner suture to close as much of the tissue gap as can be comfortably done without undue tension on the wound. You may need to repeat this step a few times to find the right amount of tension. This will leave a Y shape to the wound.

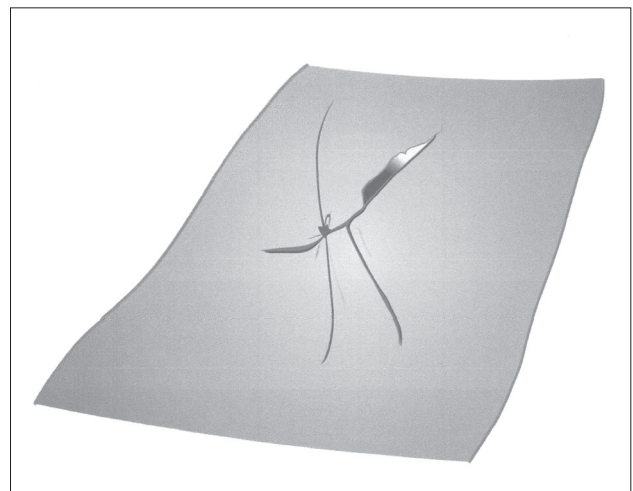


Fig. 3: The suture ends are tied just snugly enough so that the corner tip is pulled gently into place.

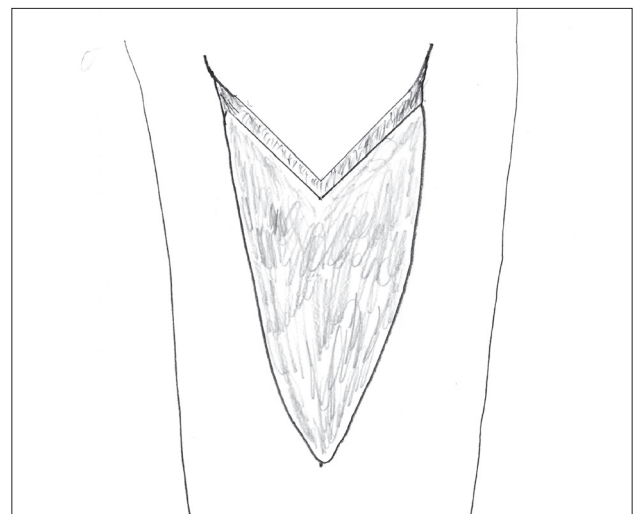


Fig. 4: If there is not enough tissue to allow the flap to completely close the wound, a V–Y closure can be done.

- Close the stem and the 2 arms of the Y-shaped wound with simple interrupted sutures. Start from the most outside portions

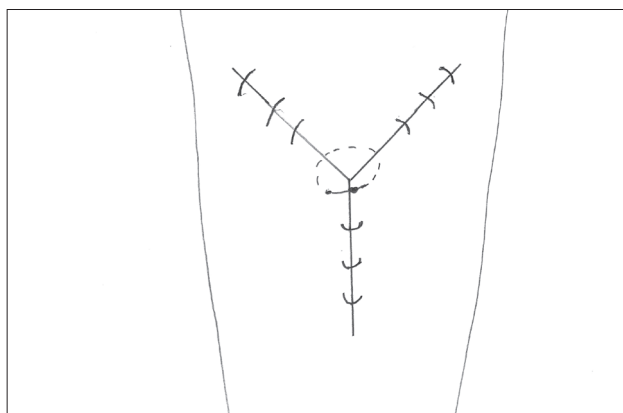


Fig. 5: The stem and 2 arms of the Y-shaped wound are closed with simple interrupted sutures, starting from the most outside portions of the Y and working inward, being careful not to place any of the interrupted sutures too close to the corner suture.

of the Y and work inward, being careful not to place any of the interrupted sutures too close to the corner suture (Fig. 5).

REFERENCES

1. Brock G, Meng F. The occasional vertical mattress suture. *Can J Rural Med* 2018;23:88-90.
2. The corner stitch. Closing the Gap. Available: <https://lacerationrepair.com/techniques/basic-suturing-techniques/the-corner-stitch/> (accessed 2018 June 10).
3. Nouredin A, Çevik AA. Corner stitch AN AAC2014. 2014. Available: www.youtube.com/watch?v=jwHmgDYTlJ0 (accessed 2018 June 10).
4. Zuber TJ. The mattress sutures: vertical, horizontal and corner stitch. *Am Fam Physician* 2002;66:2231-6.
5. Trott AT. *Wounds and laceration: emergency care and closure*. 4th ed. Philadelphia: Elsevier Saunders; 2012.

Competing interests: None declared.

Country Cardiograms

Have you encountered a challenging ECG lately?

In most issues of *CJRM* an ECG is presented and questions are asked.

On another page, the case is discussed and the answer is provided.

Please submit cases, including a copy of the ECG, to Suzanne Kingsmill, Managing Editor, *CJRM*, 45 Overlea Blvd., P.O. Box 22015, Toronto ON M4H 1N9; manedcjr@gmail.com

Cardiogrammes ruraux

Avez-vous eu à décrypter un ECG particulièrement difficile récemment?

Dans la plupart des numéros du *JCMR*, nous présentons un ECG assorti de questions.

Les réponses et une discussion du cas sont affichées sur une autre page.

Veuillez présenter les cas, accompagnés d'une copy de l'ECG, à Suzanne Kingsmill, rédactrice administrative, *JCMR*, 45, boul. Overlea, C. P. 22015, Toronto (Ontario) M4H 1N9 ; manedcjr@gmail.com