

THE SURGEON AT WORK

LOCKING A CONTINUOUS RUNNING SUTURE

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LONGER WOUNDS are closed quickly and conveniently with a continuous running suture. However, long continuous running sutures may loosen, which allows the wound to gap at one point while tightening at another, either devascularizing part of the wound or causing visible cross-hatching. Furthermore, it is difficult to turn a right or acute angle using a continuous running suture without distorting the wound at the apex. Intermittently locking the suture avoids these difficulties. These external locks also allow wound tension to be quickly and accurately adjusted for each segment of the wound closure.

TECHNIQUE

This technique may be used with any type of continuous running suture, including a subcuticular closure. It is illustrated for a continuous running horizontal mattress suture (Fig. 1). Depending on wound conditions (usually about every 2 to 4 cm of a long, straight wound), the suture is wrapped three times around the nearest limb of the previous pass and tightened into place with the surgeon providing traction on one end of the wound while the assistant provides countertraction on the other (Fig. 1, top). This maneuver stretches the wound, preventing undue suture tension, and decreasing the chance of cross-hatching or wound distortion. The lock is then squared or set by the surgeon pulling the suture toward the assistant. The lock is illustrated crossing the wound (Fig. 1, middle and bottom). The lock may also be placed on the side of the wound (or parallel to it) by wrapping the suture around the nearest limb on the same side of

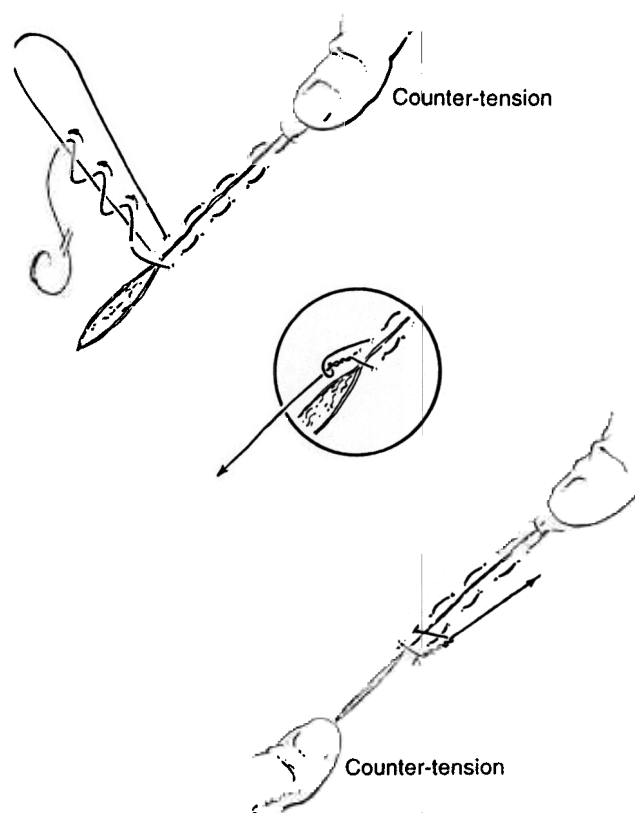


FIG. 1. Illustration of the continuous running horizontal mattress suture.

the incision. A "big bite" of tissue is taken with the skin penetration points relatively far apart so that the lock can lie flat. When the lock is set, the suture direction is usually reversed. A subcutaneous diagonal pass is necessary to get the needle back to the original starting position. The running continuous suture is then resumed.

DISCUSSION

The lock is a rapid and easy method for dividing a long, continuous running suture into multiple short independent segments without

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having to tie multiple separate knots. There are many advantages to this method. First, many wounds have different tensions at different points in the wound. The lock allows for an accurate adjustment of wound tension in the various segments without compromising the adjacent areas of the wound. Second, by dividing the wound into multiple short segments, the lock prevents wound separation associated with suture slippage, especially with sutures that have a low coefficient of friction, such as polypropylene (Prolene®, Ethicon, Inc., Somerville, NJ, etc.) and polydioxanone (PDS®, Ethicon, Inc.). Third, the lock is a relatively long area of exposed suture that tends not to put much pressure on the underlying skin as the continuous suture crosses immediately in under the lock. As a result, it is an easy place to divide and remove sutures postoperatively. Finally, the lock decreases the tendency for broken sutures to unravel. This tendency is greater in sutures with a high coefficient of friction (less knot slippage) than in those with a low coefficient.

External locks can easily be used with subcuticular sutures. The author uses it with a monofilament absorbable material (polydioxanone), removing only the lock at the appropriate postoperative visit. An external lock prevents the ulceration or "spitting" of superficially placed knots associated with absorbable sutures. An external lock with a multifilament absorbable suture (polyglactin 910 [Vicryl®, Ethicon, Inc.], polyglycolic acid [Dexon®, Davis & Geck, Markham, ON, Can-

ada], etc.) theoretically may be associated with a higher wound bacterial contamination because these multifilament sutures (compared to monofilament) harbor bacteria between the filaments and also have significant fluid absorbability, which provides a culture medium (1-3). A buried lock using this technique, or that described by Wong, may be used but is technically more difficult than an external lock (4). Subcuticular sutures may also be anchored to deep subcutaneous sutures (1).

For surgeons repairing irregular traumatic wounds, mobilizing flaps, or closing other wounds with acute angles, the lock has a special advantage. By placing the lock beyond the apex of each angle, the continuous running suture is divided into a series of short straight sutures rather than a longer suture that has to bend around and potentially distort the various angles. Locking a continuous running suture is a rapid, easy, and efficient technique to improve appropriate wound tension and wound coaptation.

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