

Surgical technique

The ambidextrous surgeon's knot: an alternate way to tie the surgeon's knot

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The surgeon's knot is a well-established knot in surgical practice, known to provide unsurpassed grip and security for the tissue tied. It is particularly useful with slippery monofilament suture materials.¹ Traditional tying of the surgeon's knot involves a cumbersome technique of repeating throws to complete the double loops of each hitch.^{2,3} We describe a 2-handed single-throw technique, which produces the 2 loops of each throw simultaneously. In tying an ambidextrous surgeon's knot, the surgeon must be able to perform an "index finger" and "middle finger" throw with both the right and left hands independently, thus resulting in a much simpler and elegant set of movements. We do not claim that this technique is unique to us, but we hope to popularize it through this article.

Technique

Start the knot by holding the white strand between the thumb and the index finger of the right hand and the black strand between the thumb and middle finger of the left hand, as shown (Fig. 1).

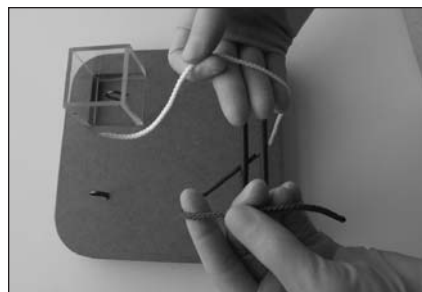


FIG. 1.

Bring the black strand over the 3 fingers of the right hand; at the same time, pass the index finger of the left hand through this loop (Fig. 2).

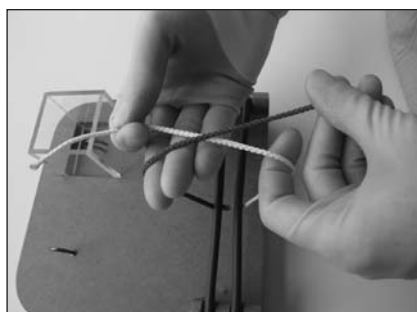


FIG. 2.

Flex the middle finger of the right hand to bring it between the black and white strands; simultaneously supinate the left hand and flex the index finger of the left hand to bring it between the black and white strands, as shown. End this step by extending the right middle finger and the left index finger in their new positions (Fig. 3).

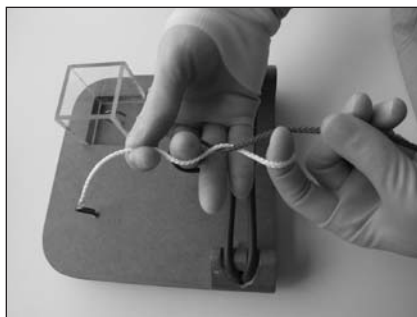


FIG. 3.

Grasp the white strand between the right middle and ring fingers and the black strand between the left index and middle fingers, releasing the strands from their original grips involving the thumbs (Fig. 4).

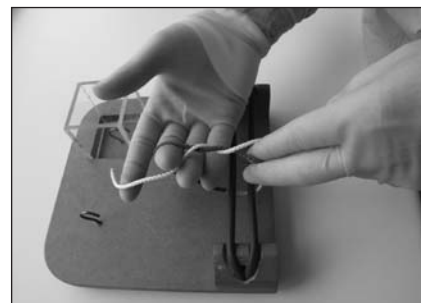


FIG. 4.

Pull the strands in opposite directions in a smooth movement to form the first set of double loops of the surgeon's knot. The strands may be regripped with the thumbs while doing this, to provide extra leverage. Push the knot down securely by applying as much horizontal tension as possible (Fig. 5).

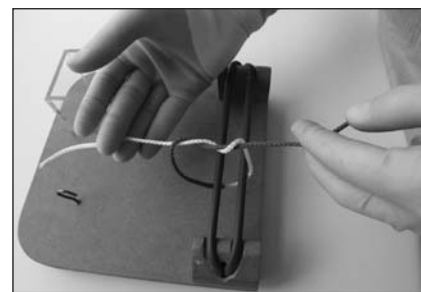


FIG. 5.

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To place the second throw, the actions preformed by each hand are reversed. The black strand is now held between the thumb and the index finger of the left hand and is looped around the 3 fingers of this hand (Fig. 6); the white strand is held between the thumb and the middle finger of the right hand and is brought toward the operator over the 3 fingers of the left hand. The index finger of the right hand is placed under the black strand, as shown (Fig. 6).

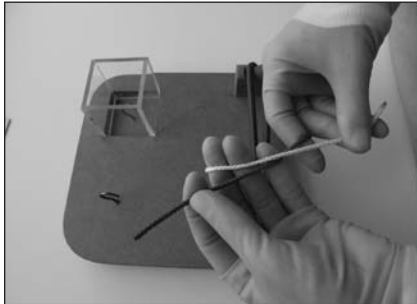


FIG. 6.

The index finger of the right hand is flexed so that it lies between the black and white strands; at the same time, the middle finger of the left hand is flexed to bring it between the white and black strands (Fig. 7).

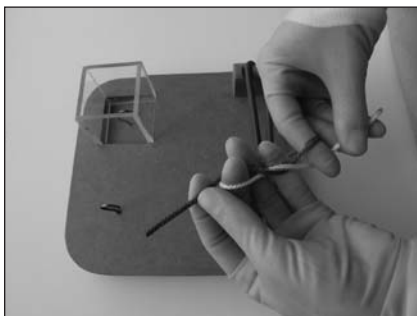


FIG. 7.

Extend the above-mentioned index and middle fingers and grip the white strand with the right index and middle fingers and the black strand with the left middle and ring fingers, releasing the

strands from their original grips, using the thumbs (Fig. 8).

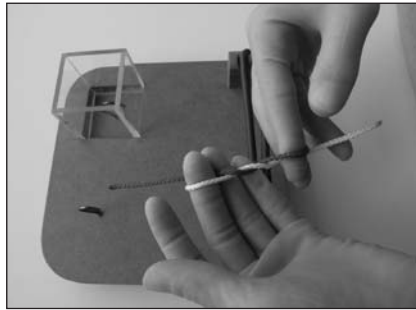


FIG. 8.

Pull the strands in opposite directions in a smooth movement to form the second set of double loops of the surgeon's knot. The strands may be regripped with the thumbs while doing this, to provide extra leverage. Secure the knot by applying as much horizontal tension as possible, completing the knot (Fig. 9).

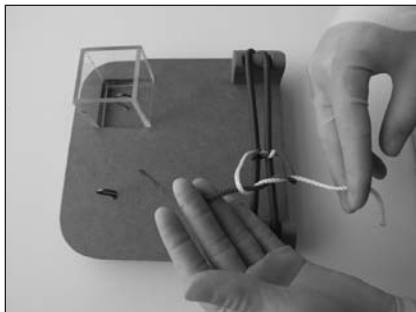


FIG. 9.

Discussion

The surgeon's knot is a secure way to tie sutures or ligate critical vessels. It is particularly useful when using nonabsorbable monofilament sutures. Another advantage of this knot is to use the double first throw to keep it from slipping when approximating tissues under tension. It is extremely useful in tying drains whose surfaces are slippery and can lead to slippage and thus loosening of traditional knots.

Various techniques have been described, in which the traditional method has been to create the second loop of each throw by repeating the steps that formed the first loop to produce the characteristic double-looping knot; this technique is taught in the Intercollegiate Basic Surgical Skills course.²

A literature review reveals many different techniques described,³⁻⁵ including single-handed techniques of tying the surgeon's knot;⁶ these can be difficult to learn and practise.

The reported technique provides a simple, rapid and easily learnable method of tying this secure knot and is worth having among any surgeon's repertoire of useful techniques.

Competing interests: None declared.

References

1. Tera H, Aberg C. Tensile strengths of twelve different types of knot employed in surgery, using different suture materials. *Acta Chir Scand* 1976;142:1-7.
2. Thomas B. *Participant handbook for the intercollegiate basic surgical skills course in general surgery*. 3rd ed. London (UK): Raven Department of Education of The Royal College of Surgeons of England; 2002. p. 15-21.
3. Surgeon's or friction knot. In: *Knot tying manual*. Somerville (NJ): Ethicon; 2005. p. 17-21.
4. Sison GP Jr. A more rapid way of tying the surgeon's knot. *Am J Surg* 1966;111: 600-1.
5. Chen CC, Chu SH. An alternative technique for tying the surgeon's knot. *J Am Coll Surg* 1994;179:342-3.
6. Lee GH. New one handed ties including the surgeon's knot. *Surg Gynecol Obstet* 1986;163:70-2.