

A simple technique for tying intracorporeal knots in laparoscopic surgery

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The ability to tie intracorporeal knots represents a major breakthrough for the laparoscopic surgeon. The acquisition of this skill tends to be particularly demanding for surgeons who begin laparoscopic procedures later in their career or who are just learning it as residents. The technique I wish to describe makes the art of knot-tying simple and straightforward by the use of a triangulation third forceps through a 5-mm port as a helper forceps. This technique can be modified when needed and I will describe such modification.

Technique

The suture is cut to about 10 cm, then grasped by the needle driver just below the needle and inserted

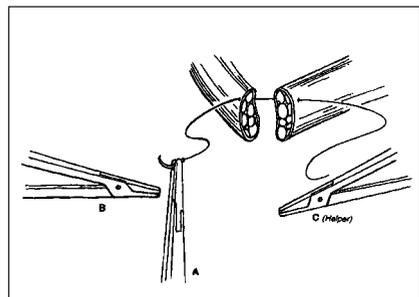


FIG. 1. A = right-hand needle driver, B = left-hand needle driver, C = helper forceps.

through a 10-mm port. The suture is then passed through the desired tissues (Fig. 1), and for the purposes of description let us imagine the suturing of crura. When the needle is passed, a short end of about 2.5 cm is left protruding. The needle is grasped with a right-hand needle driver, the needle drivers being at approximately 5 and 8 o'clock positions. A third 5-mm port is then established on the patient's left side so that it lies at the 3 o'clock position about face onto the left-hand needle driver. With the suture lying on the abdominal contents, it can be grasped by the helper forceps at or

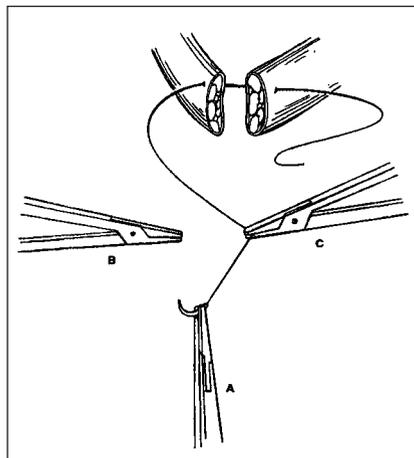


FIG. 2. A = right-hand needle driver, B = left-hand needle driver, C = helper forceps.

near the end of the needle (Fig. 2) and simply looped twice around the left-hand needle forceps (Fig. 3), which is held still across the abdomen. The suture is then dropped from the helper forceps, which picks up the free end (Fig. 4) extending from the left crus and passes it into the waiting open points of the left-hand needle driver which can easily draw the suture through the loop (Fig. 5). At this point, the loop is tied and then whichever forceps is

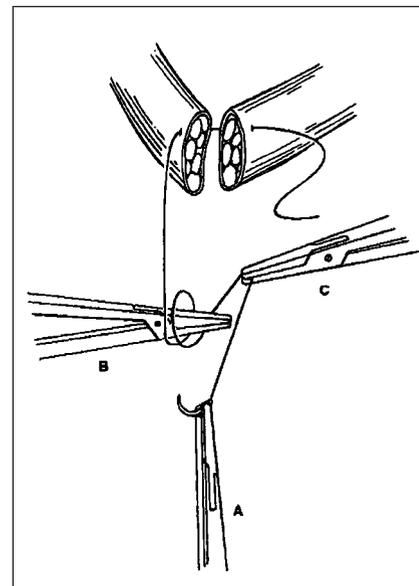


FIG. 3. A = right-hand needle driver, B = left-hand needle driver, C = helper forceps.

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handy can be used to tighten the knot. The advantage of this technique is that a double loop is very easy to make with the first throw and then again, by the same process, it is easy to do a reverse double loop on

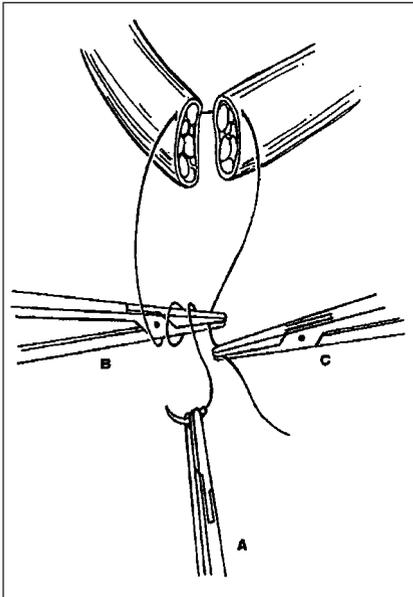


FIG. 4. A = right-hand needle driver, B = left-hand needle driver, C = helper forceps.

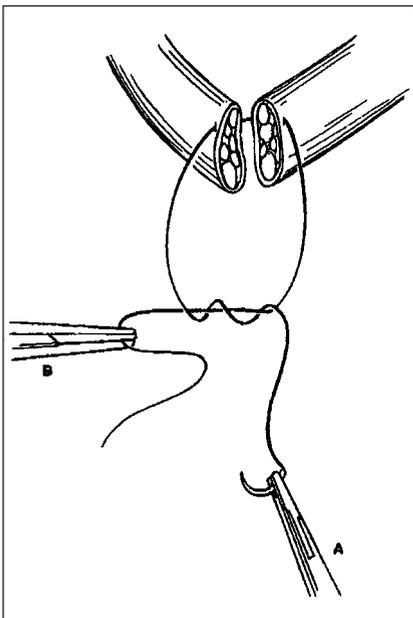


FIG. 5. A = right-hand needle driver, B = left-hand needle driver.

the second throw and so on. This process makes tying the knot extremely straightforward. A variant of this technique, which is particularly useful in Nissen fundoplication, is the use of a curved ring forceps through a malleable 5-mm trocar, which we use to pull the fundus around behind the esophagus. This forceps is used as a helper forceps to tie the knot, and is sited at roughly the 7 o'clock position. With this technique, longer lengths of free thread are left exposed after passing

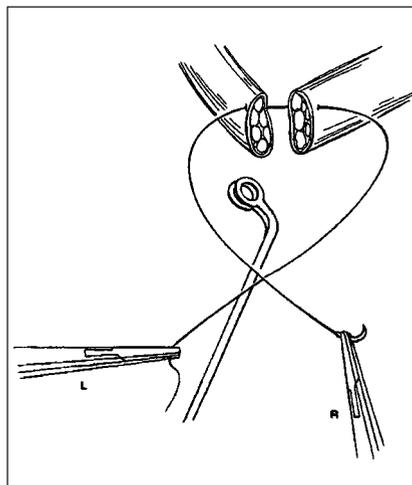


FIG. 6. L = left, R = right.

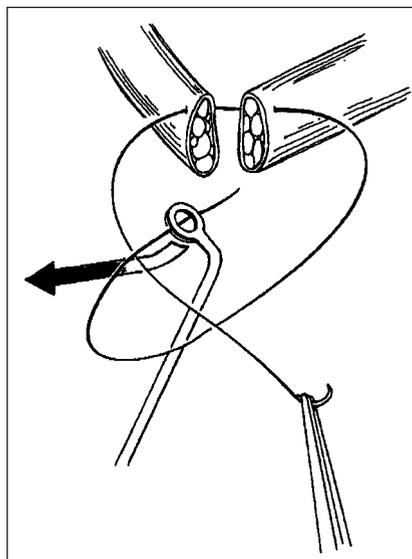


FIG. 7.

the suture, and then the right-hand needle driver holds the needle while the left-hand needle driver holds the needleless end underneath or inferior to form an X configuration (Fig. 6). The curved ring forceps is then passed under and into the top triangle formed by the crossed threads and the crura. The thread in the left-hand needle driver is passed to the ring forceps and pulled underneath, thus forming a loop (Fig. 7). This process can be repeated to tie a double throw. Once the first throw is tied, the needle-ended thread is held fairly tautly across the abdomen. The left thread is allowed to dangle to form a loop inferior to the other thread. The ring forceps is then passed above the loop and under the other thread and grasps the free end of the looped thread, which is then pulled out, thus tying the next part of the knot. This process can be repeated as often as necessary to complete the knot.

Comment

This simple technique for tying intracorporeal knots makes what can be a difficult and frustrating procedure quite straightforward. Certainly, the technique may only be of major advantage to less experienced surgeons or surgeons converting from an extracorporeal to intracorporeal knot tying technique and for the beginning laparoscopic surgeon. The ability to suture laparoscopically, however, is very helpful. Using these techniques it is also possible to put in a longer suture and to perform continuous suturing, which can be very difficult without the use of a helper forceps.

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