CASE NOTE

Forming an intracorporeal slip-knot in laparoscopic suturing

Usman Jaffer, MB BS, BSc(Hons), MSc

From the Department of General Surgery, Norfolk and Norwich University Hospital, Norwich, UK

Correspondence to:
Dr. U. Jaffer
Department of General Surgery
Norfolk and Norwich University Hospital
Colney Lane
Norwich NR4 7UY
UK
usman.jaffer@doctors.org.uk

Laparoscopic suturing presents an important skills barrier to developing a laparoscopic surgical practice. The formation of a slip-knot greatly assists in approximating tissue that may initially be under tension or when the suture material is difficult to tie owing to memory (the property of resisting deformation). I describe here a technique that allows the surgeon to fashion an intracorporeal laparoscopic slip-knot in a controlled and consistent manner using either monofilament or braided suture material.

Case report

A 50-year-old man presented with a 24-hour history of central abdominal pain localized to the right iliac fossa. The medical and family history were not relevant. The patient appeared flushed and was afebrile. His vital signs were normal, and his right iliac fossa was tender when palpated. His leukocyte count (8.6×10^9/L) and C-reactive protein (129 mg/L) were elevated.

At laparoscopy he had a perforated sigmoid diverticulum. The edges of the perforation were healthy, so suture repair was possible. Approximation of the edematous tissue was accomplished using an intracorporeal slip-knot technique. Drainage of the peritoneal cavity and intravenous administration of antibiotics resulted in a smooth postoperative course, and he left hospital 5 days later.

Technique

The surgeon passes the suture needle through the tissue to be approximated in standard fashion, then forms a single hitch using whichever technique is most comfortable. The surgeon forms a second hitch on top of the first using a throw in the opposite direction and "snugs down" the hitch to form a conventional reef knot configuration. Grasping the suture with needle holders at the point where the suture exits the tissue and a few centimetres distal to the knot, the surgeon converts the reef knot into a slip-knot by applying distracting forces on the suture material at the 2 mentioned points. A palpable "give" will be felt when the knot converts (Fig. 1). The knot can now be slid using downward pressure from the needle holder while keeping the distal end of the suture taut (Fig. 2). Once adequate approximation is achieved, the surgeon can again convert the slip-knot to a reef knot by applying horizontal distracting forces on the 2 ends of the suture material. A further square knot will secure the reformed reef-knot.

Discussion

We have previously discussed laparoscopic suturing as part of the management of perforated diverticular disease.[1] The laparoscopic slip-knot is a useful tool in the surgeon's armamentarium, particularly when edematous tissue needs to be

Fig. 1. Distracting force applied where the suture material exits the tissue and a few centimetres distal to the knot will convert the reef not into a slip-knot. The surgeon will feel a "give" as the conversion occurs.

apposed or when tissue is under tension. Experimental work comparing various laparoscopically tied knots has shown that the extracorporeal tied laparoscopic "square" slip-knot is better than the Roeder-type slip-knot and has inferior strength only compared with a surgeon's conventional knot.[2] The ability to form a slip-knot may add confidence in tackling tasks that involve laparoscopic suturing.

Fig. 2. With the surgeon holding the suture material taut with the more distal needle holder, the slip-knot can now be slid downward to achieve satisfactory approximation of the tissue edges.

Competing interests: None declared.

References

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2. Dorsey JH, Sharp HT, Chovan JD, et al. Laparoscopic knot strength: a comparison with conventional knots. *Obstet Gynecol* 1995;86:536-40.