

EXPERIENCE PAPER: PERITONEAL CLOSURE IN TAPP HERNIA REPAIR

V-Loc™ 180 Absorbable Wound Closure Device



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PRODUCT DISCUSSED: V-Loc™ 180 absorbable wound closure device

Laparoscopic repair of inguinal hernias has become a widely accepted technique due to the efficacy and safety of this approach. Transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP) approaches are associated with peritoneal defects or tears. Nonclosure or insufficient closure of these defects can lead to bowel obstruction.¹ This complication incidence ranges from 0.5-2.55% in the published literature.^{2,3}

In the early postoperative period obstruction is mostly attributed to inadequate peritoneal closure and trocar site herniation.⁴

Late complication bowel obstructions may be due to adhesions to tacks, staples or the mesh.^{5,6} Peritoneal closure is one of the essential steps in TAPP hernia repair. The different closing procedures have various strengths and weaknesses. Commonly used closing devices are the Hernia Stapler, Absorbable Tacker, Spiral Tacker, Extracorporally knotted running suture and Clip guarded running suture.

The Tacker fixation devices are easy to handle and account for a quick peritoneal closure. The Absorbable Tacker fixation devices have the advantage that the absorption of the tacks is essentially completed prior to one year. But improper tack fixation can leave a loose tack in the abdominal cavity or a sharp protruding end of the spiral tack giving rise to complications.⁵

With the Hernia Stapler a quick peritoneal closure can also be performed with the disadvantage of nonabsorbable fixation elements. Staples and especially spiral tacks are reported to contribute to adhesion formation². Early bowel obstruction has been reported in different studies; mainly related to preperitoneal herniation due to peritoneal defects with failed closure^{1,7} and incarceration of bowel between two fixation devices used in peritoneal closure⁸.

Both sutures – the knotted and clip guarded – bear the risk of undetected suture failure. The extracorporally knotted

running suture may become loose due to a technical failure or the fact that the monofilament thread gives way at high tension. The possible slippage of the clips represents another lack of security in peritoneal closure.

Thus, each of the mentioned techniques bears the risk of specific complications. As a new method of peritoneal closure, Medtronic's V-Loc™ 180 and V-Loc™ 90 devices have been recently introduced to the market. They consist of a uni-directional barbed thread which fixates itself in the tissue. The self-anchoring loop and barb combination enables the surgeon to close peritoneal defects quickly and securely without tying knots or changing standard closure techniques. This device is easy to use and effective.

The fact that tissue is grasped at numerous points and the lack of constriction of the peritoneum when tightening the suture may lead tensile forces to be distributed more evenly. The bars tend to secure the peritoneal closure as well. The absorption of the V-Loc™ wound closure device is completed within six months for the V-Loc™ 180 device and three months postoperatively for the V-Loc™ 90 device. It has been demonstrated that barbed devices can exhibit equal or better biomechanical performance than a knotted suture in both tensile strength and wound holding capacity⁹ while reducing suturing time¹⁰.

The potential to eliminate knots in peritoneal closure, as well as tacking and stapling related complications is an interesting aspect of this wound closure device.

I experienced many problems related to peritoneal closure devices over the years. Tacks and staples may be displaced or loosen in the abdominal cavity giving rise to complications including bowel herniation through failed peritoneal closure and bowel obstruction. Additionally, bowel obstruction may be caused by adhesions to tacks or staples.

Suture closures present problems such as knot failure and loosening of the suture or slippage of the guarding clips.

The properties of this barbed device such as prevention of suture movement or the knotless design are invaluable. This single-surgeon's experience with the V-Loc™ 180 device during the past seven months has been absolutely favourable.

The V-Loc™ wound closure device has been used for peritoneal closure in 100 TAPP hernia repairs reaching sufficient suture tensile and barb holding strength, so that no insufficient peritoneal closure has been observed so far due to suture failure. Furthermore, there were neither complications nor adverse effects related to the V-Loc™ wound closure device.

The pictures below show the use of the V-Loc™ 180 device in peritoneal closure during TAPP hernia repair.



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