

Port-Site Closure Using a Modified Aptos Needle

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ABSTRACT

Background and Objectives: Trocar-site incisional hernias are the most common complications in laparoscopic surgery. Fascial closure of port sites represents a challenging issue in laparoscopic surgery.

Methods: We describe a simple easy technique for fascial closure of port sites using a double-tip needle (Lasheen needle). This study included 100 patients who underwent laparoscopic surgery from January 2009 through August 2011 in the General Surgery Department, Zagazig University Hospital, Zagazig, Egypt. The mean follow-up period was 2 years for any wound complications at these trocar sites.

Results: The mean age of the patients was 39.5 years, and the mean time for placement of one suture was 2 minutes. No trocar-site herniation occurred with our technique during the period of follow-up. Infection developed at the trocar site in 3 patients.

Conclusion: This technique is easy, simple, safe, fast, inexpensive, and effective for fascial closure of trocar sites.

Key Words: Double-tip needle, Port-site closure.

INTRODUCTION

The introduction of laparoscopic surgery has brought with it new technical challenges. One of these is fascial closure at port sites, which is necessary especially when large trocars are used or after dilation of a port site for organ extraction. New developments, such as single-port laparoscopic surgery, and the need for small esthetic incisions render fascial closure a current issue. Closure of these wounds generally is quite difficult, especially in obese patients, and rarely complete because of the small opening of the skin incision.¹ An incisional hernia at the site of trocar entry is a serious complication of laparoscopy because most trocar-site herniations require further surgery.² Herniation associated with laparoscopic trocar sites can occur with incisions as small as 3 mm.³ It is recommended that all 10- and 12-mm trocar sites in adults and all 5-mm port sites in children be closed, incorporating the peritoneum into the fascial closure.⁴ The standard closure technique for fascia at the port site can be tricky and frustrating, often requiring blind suturing of the fascial defect (with the risks of incomplete suture and injury to the intraperitoneal organs) or larger skin incisions. A new method for safe, complete, easy suturing of the abdominal fascia in port-site wounds is proposed in this study.

METHODS

This study was performed in the General Surgery Department, Zagazig University Hospital, Zagazig, Egypt, from January 2009 through August 2011. We randomly selected 100 patients (79 women and 21 men) with chronic calculous cholecystitis for enrollment in this study. All information about the technique was discussed with all patients, and all patients gave consent for inclusion of their data in this study. The age of the patients ranged from 22 to 58 years (mean, 39.5 years). The instrument used in the procedure was a double-tip needle (Lasheen needle),⁵ which was prepared by the corresponding author for this technique. It is a curved needle; its length ranged from 10 to 15 cm. It has 2 sharp pointed ends and a long hole at the middle of needle, through which the thread (No. 0 Vicryl; Ethicon, Somerville, NJ, USA) is passed (**Figure 1**). After removal of the gallbladder was completed laparoscopically, any trocar site [me]10 mm was closed by this

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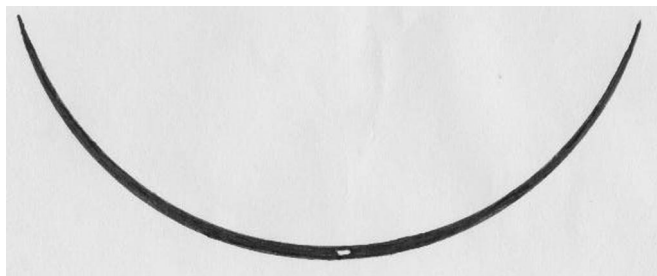


Figure 1. Lasheen needle. It is a curved needle; its length ranges from 10 to 15 cm. It has two sharp pointed ends and a hole at the middle of its length, through which the thread (No. 0 Vicryl) is passed.

technique. Slowly absorbable No. 0 suture (braided coated glycolide homopolymer violet) was passed through the middle hole of the needle. The needle with thread was passed through the port wound at the subcutaneous prefascial plane to come out through the skin about 2 cm from the wound edge (only about two-thirds of the needle appears outside the skin). At this point, the needle direction was changed to pass by the other needle end through the abdominal fascia to appear from the skin on the other side of the trocar wound about 2 cm from its edge (only about two-thirds of the needle appears outside the skin). Then, the needle direction was changed to pass by the first needle end, which was still present inside the tissue, through the subcutaneous prefascial plane on the other side of the trocar wound. Finally, the needle with thread came out completely from the trocar wound. After this last step, one complete suture will have been formed, where one limb of suture was passed through one side of the wound through the prefascial plane and the abdominal fascia on both sides of the trocar wound; the other limb of suture was passed through the other side of the wound at the prefascial plane to appear from the trocar wound. The two strands of suture were tied through the wound to close the abdominal fascia well, and the suture knot lay directly on the anterior abdominal sheath (**Figure 2**). The follow-up period ranged from 4 to 32 months (mean, 2 years) for any complications at the trocar site that that was closed by this technique.

RESULTS

No port-site hernias occurred during the period of follow-up (mean, 2 years), consisting of clinical examination and abdominal ultrasonography. The time to place one suture with this procedure ranged from 1.5 to 3 minutes (mean, 2 minutes). Superficial wound infection occurred

in 3 patients (3%). No death was reported with this technique.

DISCUSSION

Since the first report of herniation at a trocar site after laparoscopy, many techniques and devices have been introduced into practice to minimize the risk of port-site complications, which occur in 1% to 6% of cases.⁶ Trocar-site incisional hernia is a complication that is often subclinical, so the actual incidence may be much higher than that reflected in most series. The trocar hole diameter is a fundamental factor in the emergence of trocar-site herniation. Therefore, holes ≥ 10 mm must be properly closed at all levels. Any predisposing surgical and patient factors should be properly assessed, and closing all holes of any diameter is advised in obese patients, diabetic patients, or patients aged >60 years.⁷ The port-closure techniques were classified by Shaher¹ into 3 groups: (1) techniques that use assistance from inside the abdomen (requiring 2 additional ports), (2) techniques that use extracorporeal assistance (requiring 1 additional port), and (3) techniques that can be performed with or without visualization (without additional ports). As a disadvantage, most of these techniques require special devices; some are time-consuming or require assistance from inside the abdomen (or both). Lasheen et al.⁸ and Botea et al.⁹ described techniques for port closure through suture putting percutaneous on both sides of port wound and after that two suture strands bring to port wound by using redirecting suture hook or direct subcutaneous dissection, respectively, where tied the suture through port wound. These previous techniques for port-site closure are safe and effective, but subcutaneous passage with redirecting of the suture hook or direct subcutaneous dissection carries the risk of wound complications (infection, hematoma, seroma formation) and is more invasive and time-consuming. Our technique for trocar-site closure avoids these disadvantages (subcutaneous instrument passage or dissection) by allowing the first and last steps of suturing to be accomplished through the port wound with the use of the Lasheen needle. This leads to a minimally invasive procedure, decreasing wound complications (infection, hematoma, and seroma formation), and is less time-consuming.

CONCLUSION

Our procedure for port-site closure is novel, effective, safe, easy to perform, less invasive, less time-consuming, and virtually costless.

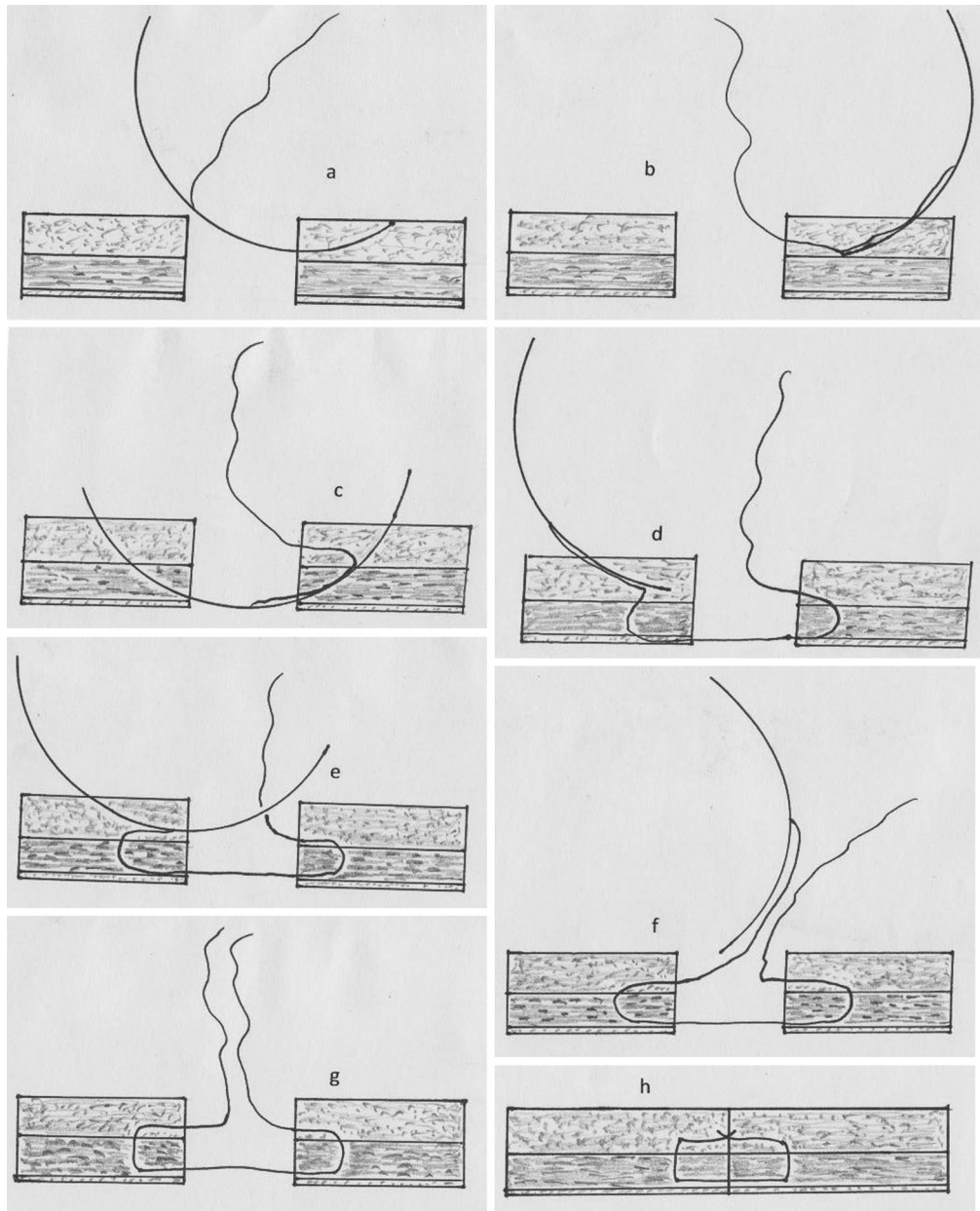


Figure 2. (a) (1) Skin and subcutaneous layer. (2) Fascial layer. (3) Peritoneum layer. The Lasheen needle with thread is passed through the port wound at the subcutaneous prefascial plane from one side of the wound to come out through the skin about 2 cm from the wound edge. (b) Only about two-thirds of the needle appears outside the skin. At this point, the needle direction is changed to pass by the other needle end through the abdominal fascia. (c) The needle with thread is passed through the abdominal fascial layers from both wound sides to appear from the skin on the other side of the trocar wound about 2 cm from its edge. (d) Only about two-thirds of the needle appears outside the skin from the other trocar wound side. Then, the needle direction is changed to pass by the first needle end, which is still present inside the tissue, through the subcutaneous prefascial plane on the other trocar wound side. (e) The needle with thread passes through the subcutaneous prefascial plane from the other wound side to come out from the port wound. (f) Finally, the needle with thread comes completely from the trocar wound. (g) One complete suture has been formed where one limb of suture is passed through one wound side through the prefascial plane and the abdominal fascia on both sides of the trocar wound, and the other limb of suture is passed through the other wound side at the prefascial plane to appear from the trocar wound. (h) The two strands of suture are tied through the wound to close the abdominal fascia well, and the suture knot lies directly on the anterior abdominal sheath.

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