Fascial Repair of Laparoscopic Ports with Allis–Hemostat Technique

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Abstract Port site hernias are one of the most serious complications associated with laparoscopic surgery. In this study, we present a simple and reliable method for port site closure in laparoscopic surgery. From 2005 to 2011, 500 patients who underwent laparoscopic surgery were enrolled for the study. They were evaluated considering age, sex, indication of laparoscopic surgery, and early and late complications of port site and were followed up at least for 1 year after the surgery. In our study, 180 males and 320 females with mean age of 36 years were enrolled. The most common indication for laparoscopic surgery was cholecystectomy in 320 patients (64 %). There were no early or late complications of port site after surgery. Our method is a new modification of the procedure presented by Spalding. Using Allis forceps and putting it under the fascia seems to be a more suitable technique which facilitates the laparoscopic port repair. We found it to be extremely safe, simple, and easy to teach.

Keywords Laparoscopic surgery · Port site · Complication

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Introduction

Recently, laparoscopic surgery has been used more frequently due to cosmetic results and to reduce pain in comparison to open surgery. As for all new surgical procedures, it may cause some complications. One of the most serious complications associated with laparoscopic surgery is port site hernia [1–4]. Standard suture techniques can be laborious and often involve blind closure of the fascial defect. Furthermore, adequate closure via external sutures may be difficult especially in obese patients. Although a number of techniques have been developed to facilitate this fascial closure, most of them require special and often expensive disposable devices [1, 5–10].

Material and Method

This study was performed on 500 patients who underwent laparoscopic surgery at Ghaem Hospital of Mashhad University of Medical Science from 2005 to 2011. (All patients were examined 1 week, 1 month, and 1 year after surgery for complications of laparoscopic ports by physicians who were not involved in the study.) Then demographic characteristics including age, sex, indication of laparoscopic surgery, and early and late complications of port site were analyzed by SPSS version 11.5 software.

Technique

This technique is very simple and can be done by using one Allis and one hemostat with suture and needle. After completion of the operative laparoscopic procedure, the patient is returned to a flat position, the peritoneum is deflated, and the Allis with closed jaws is placed into the wound to lift up

one side of the wound while a curve hemostat retracts the overlying subcutaneous tissue over the fascia. The suture needle is driven through the abdominal fascia from outside–in direction, to emerge between the jaws of the Allis. The space between the Allis lets the needle to rotate and insert through the tissue without hindrance and will help it to take a suitable bite of deep fascia (Fig. 1). A similar maneuver is repeated on the other side of the defect, but in this step, the same previous suture needle is inserted between the jaws of the Allis in an inside–out direction. Upon lifting up the trocar wound by the Allis, the Allis is rotated to another edge beneath the peritoneum. The same steps are repeated with the same suture but in an opposite inside–out direction. The needle is placed between the two jaws of the Allis, while the needle tip is inserted through the fascia, and the fascia is lifted up by the Allis. The overlying skin edge is retracted laterally for the emergence of the needle. A fine hemostat grasps the tips of the needle and pulls it out of the wound. A suitable bite of deep fascia is taken and the two free ends of the sutures are tied together to close the defect. Finally, with laparoscopic visualization via the lateral port, we will make sure that the omentum or bowel loop is not implicated in the suture, and suitable homeostasis and safe repairing has been achieved.

Results

Five hundred patients were enrolled in our study of whom 180 were male and 320 were female (M/F=0.56). Their ages ranged from 25 to 47 years with the mean age of 36 years. The indications of laparoscopic surgery included: (1) cholecystectomy in 320 patients (64 %), (2) splenectomy in 70 patients (14 %), (3) morbid obesity in 70 patients (14 %), and (4) hernia in 50 patients (10 %). No early or late port site complications were reported during follow-up period.

Fig. 1 Outside–in direction. The suture needle is inserted between the jaws of the Allis

Discussion

Our method is a new modification of the procedure presented in 2003 by Spalding [4]. In the Spalding's technique, two hemostats and a needle holder with suture and needle are required. The closure technique is as follows: The first hemostat is inserted into the wound and the fascia is lifted up by the tip of the hemostat from the underlying viscera. The other hemostat is used to retract the overlying subcutaneous tissue. The suture needle is inserted through the exposed fascia in a rotating direction to exit between the two splayed tips of the hemostat. The technique is repeated at the other side of the defect. The direction of the needle in each side of the wound in Spalding technique is outside–in through the fascia [4].

Ng et al. have expressed one disadvantage for dual hemostat “outside–in” technique. He thinks that the openness of the first hemostat would stretch the wound edge tightly so the surgeon often cannot get a suitable bite of the fascia for a safe closure. He commented on this technique by describing a useful trick: “driving the needle inside–out instead of outside–in to ensure inclusion of abundant deep tissues for closure” [11]. Ng et al. suggested a modification for this problem. They suggest an inside–out direction of the needle in both edges of the fascia for taking a suitable tissue bite [11]. Durkin and Horner modified the dual hemostat procedure by using a small retractor for exposing the fascia at the wound edge instead of hemostat. They also maintained the pneumoperitoneum and left the lateral ports in place for final monitoring till the umbilical port site closure [12]. In our technique, we used Allis instead of hemostat. Allis does not need to be opened because there is a space between its two jaws so when the tips of the Allis are inserted into the wound, the fascial hole is not stretched (this point has been expressed by Dr. Ng as a disadvantage). Then, we could have a suitable fascia for outside–in maneuver. As the knot is over the wound, it does not need to be pulled through the fascia. While, in previous procedures, the knot was located beneath the fascia and it had

to be pulled through multiple musculoaponeurotic layers to locate over the fascia, so another knot was needed to close the fascia. It was time consuming and could be traumatizing [13]. Our technique “outside-in/inside-out” have the following advantages: (1) It is simple, inexpensive, and easier to execute. (2) It is time saving. (3) It is safe, with little or no risk of trauma to the underlying viscera caused by the needle, because it is between the Allis jaws and the wound edge is pulled up forcefully by the Allis. (4) Fascial closure is always inspected laparoscopically via the remaining port which ensures that the intraperitoneal viscera are not traumatized and an airtight repairing and homeostasis has been achieved. (5) It ensures the inclusion of abundant facial tissue for a safe closure. This is particularly important in patients with predisposing factors for complications of incisional hernia.

Conclusion

We suggest the outside-in/inside-out technique and using Allis instead of hemostat for laparoscopic fascial ports closure. Using Allis forceps and putting it under the fascia seems to be a more suitable technique, which can facilitate laparoscopic port repair. We have used this technique in more than 2,000 patients and found it extremely safe, simple, and easy to teach.

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