CASE REPORT

A Simple Technique of Laparoscopic Port Closure

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ABSTRACT

Background: Laparoscopic and robotic surgery is widely practiced in modern medicine. The operative procedure is not complete until the port sites are closed with a fascial suture. We report a simple new technique that is easy, cost-effective, and quick to apply using 2 S-retractors for suture placement under direct visualization to secure the abdominal wall fascia and peritoneum.

Materials and Methods: As a prospective consecutive case series, this technique was used for fascial closure after laparoscopy ports > 8 mm using 2 S-retractors. One S-retractor is used as a barrier protecting the contents of the abdominal cavity, reducing the risk of visceral injuries. The second S-retractor allows us to directly visualize the different layers, exposing the needle tip during its course through the fascia.

Results: This method was used in 100 patients with no intraoperative incidents, additional operative time, or need to access costly instruments. Currently, this technique is also used by many surgeons in our institution without any difficulty. No bowel injuries or port-site hernias were reported during a mean follow-up of 6 wk postoperation and 12-mo annual follow-up.

Conclusion: The procedure is simple, easy, cost-effective, and quick to apply.

Key Words: Laparoscopic surgery, Port-site closure, Trocar-site hernia, S-retractors.

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INTRODUCTION

Laparoscopic and robotic surgery is widely practiced in modern medicine. The operative procedure is not complete until the port sites > 8 mm are closed with a fascial suture. We report a simple new technique that uses 2 S-retractors for suture placement and direct visualization to secure the abdominal wall fascia and peritoneum. We have used this technique as case series in our institution over the last 3 y in over 100 laparoscopic gynecology cases at umbilical and lateral port sites > 8 mm used for camera, morcellator, or endocatch bag to retrieve specimen.

Complications related to port sites are most commonly reported to be incisional hernias.[1,2,3,4] Since the first report of herniation at a trocar site after laparoscopy,[5] 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.[6,7,8,9] Another complication noted was incorporating the bowel in trocar-site closure.[10] Many techniques and instruments have been developed to provide fast, secure closure. However, at many hospitals and surgical centers, these instruments may not be available (e.g., remote locations or third world countries). The avoidance of instrumentation also decreases cost and time. Many techniques also require additional ports for intraabdominal visualization with a laparoscopic camera, along with the use of additional instruments.[11] Hand-sutured closures remain cheap and practical and do not require the use of extra instrumentation.[12] Our technique is simple, easy, cost effective, and quick to apply.

PATIENTS AND METHODS

This technique requires only standard operating room equipment (i.e., 2 S-retractors and suture to close the fascia).

Technique

The surgical procedure requires a surgeon and an assistant. The procedure is a 2-step process and is performed as follows. Through the incision, the surgeon inserts an S-retractor (#1) into the peritoneal cavity. The abdominal layers are lifted with this S-retractor (#1), creating a barrier

between the fascia and the visceral contents. The assistant uses another S-retractor (#2) to retract the skin, fat, and muscle in the opposite direction to expose the fascia. The surgeon uses a needle suture to grasp the fascia. The #1 S-retractor still in the peritoneum is then rotated 180 degrees by the surgeon to allow for working on the opposite side of the fascia. The #2 S-retractor used by the assistant is also moved to the opposite side of the abdominal wall layers to expose the fascia. The surgeon again continues to grasp the opposite side of the fascia with the suture. The 2 ends are tied and the fascia is closed **(Figure 1)**. (If the fascia defect is > 10 mm, we may continue the same technique for another interrupted suture, "figure of 8" or running closure.)

RESULTS

This technique was used in 100 patients with no intraoperative incidents. It is also used by many surgeons in our institution without any difficulty. No bowel injuries or port-site hernias were reported during a mean follow-up of 6 wk and a 12-mo annual follow-up.

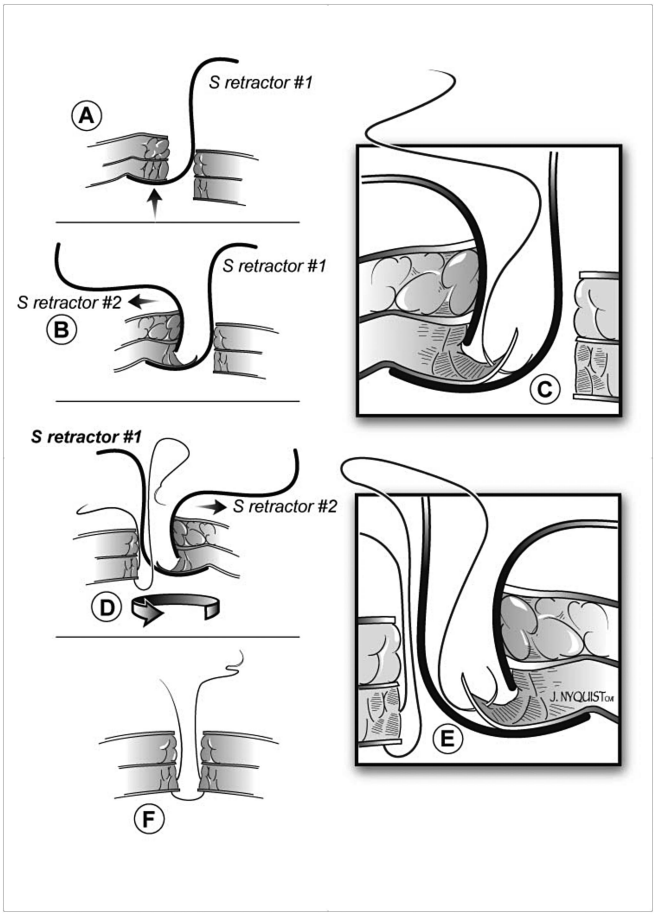

Figure 1. Technique using 2 S-retractors for suture placement under direct visualization to secure the abdominal wall fascia and peritoneum.

DISCUSSION

Meticulous closure of laparoscopic ports is important to prevent the incidence of port-site incisional hernia, incorporation of bowel in port-site closures, and their complications. Failure to adequately suture the fascial defect, infection, or suture disruption may lead to an incisional hernia or to ascitic fluid leakage in the case of patients with cirrhosis.[5] Besides the classical hand-sutured technique, 29 original methods have been described for fascial closure.[13,14] Shaher[13] classified the different port-closure techniques into 3 categories: (1) techniques that use assistance from inside the abdomen (requiring 2 additional ports); (2) techniques that use extracorporeal assistance (requiring 1 additional port); and closure techniques that can be performed with or without visualization (no additional ports). Many of these techniques need special devices; some of them are time-consuming, costly, need assistance from inside the abdomen, or may be unavailable at the institution. In contrast, the technique reported on in this article uses equipment commonly available in the operating room.

This technique was used on private and clinic patients over a period of 3 y. This is a personal prospective consecutive case series. This technique was devised to be reasonable, free of complications, and used by an average gynecologist and surgeon during laparoscopic surgery. In this study, patients were observed during a 6-wk postoperative visit and 12-mo annual follow-up, and no complications were reported.

Our technique can be performed with or without visualization (no additional ports) and no additional instrumentation. We could not find any article in the literature that describes a similar technique. As the case series, we use our technique for any trocar site > 8 mm. This method involves minimal training and surgical skill, is quick to perform, and requires no additional instrumentation and no additional cost to the institution, surgeon, or patient. S-retractors are standard instruments in the operating room. The S-retractor is an available, inexpensive instrument that allows a quick way to assess the length and depth of the port site. The final result is an optimal suture of the fascia for port-site closure. The method is also safe because the tip of the needle does not enter the peritoneal cavity blindly, where the bowel

or other visceral organs may be present. Rather, the S-retractor functions as a barrier protecting the contents of the abdominal cavity, reducing the risk of visceral injuries. This technique also allows us to directly visualize the different layers exposing the needle tip during its course through the fascia. In the intraperitoneal cavity, there is no needle tip, thus increasing the safety of the procedure. We believe that this method may also be used in other procedures, such as robot-assisted surgeries. This technique was used in a case series of 100 patients, which may be considered a study drawback, because it is not statistically representative. However, we wish to introduce this new technique for closing port sites in a simple, easy, cost-effective, and quick-to-apply method. The efficacy of this new procedure in preventing port-site hernias is proven by the technique itself, which allows performance of an optimal fascial closure. More important, the safety of this procedure is clear, because the S-retractors act as barriers to the open needle tip from the visceral organs, and direct visualization of the needle grasp of the fascia minimizes the risk of internal injuries. These technical advantages prove the efficacy of this new method for port-site closure. Currently, there are many surgeons at our institution performing this technique without any difficulty or complications.

CONCLUSION

Closure of the fascia should remain simple, easy, cost-effective, and quick to apply. It should also be safe and without any complications. The technique described here fulfills all these criteria.

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