

Veress Needle for Port-site Closure

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ABSTRACT

Port closure is essential after successful laparoscopic surgery to prevent incisional hernia. There are various devices like: fascial closure needle, Cobbler's needle and suture passer to close 10 mm ports in laparoscopic surgery. We have reported a novel technique for the closure of the ports after laparoscopic surgery. Using this simple technique, all the ports are closed under vision, thus preventing port herniation by using simple Veress needle.

Keywords: Laparoscopic port closure, Port closure technique, Veress needle.

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INTRODUCTION

Minimal access surgery is a routine surgical practice due to its minimally invasive nature and associated advantages.^{1,2} It has a lot of advantages but not devoid of complications, one of the major concerned complication is the trocar site herniation (TSH). Trocar site herniation is a serious complication often requiring emergency reoperation for repair. If unattended, TSH can lead to small bowel strangulation and incarceration.

The literature says that preventative measures should be taken to avoid the occurrence of herniation at the portsite.^{1,2} Fascial closure has been recommended as a means of TSH prevention. One study reported a statistically higher frequency of hernias at 12 mm port-sites where the fascia was left open (8%) compared with those that were closed (0.22%) following laparoscopy.³ There is a general consensus that all port-sites greater than or equal to 10 mm should be closed due to an increased risk of herniation.^{1,3,4} For smaller ports fascial closure may not be necessary, except when manipulated extensively.^{5,6}

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Trocar site herniation is also associated with other technical factors other than the port-site. Port location is another factor. There are many reports suggesting that umbilical sites are at a greater risk of herniation when compared to lateral port-sites.^{1,7,8} This is due to weakness of the fascia and absence of supporting muscle in this area.^{1,2} Stretching or even extending the incision of a port-site during specimen extraction has a greater risk of hernia development.^{9,10} Factors like high body mass index (BMI) are patient-related risk factors that are associated with TSH include.^{8,11-13} Here it is related to the increased intra-abdominal pressure and increased abdominal wall thickness.^{2,14} Studies show that wound infection is a predisposing factor to hernia development.¹⁵ Therefore, closure of fascia is necessary for umbilical ports, port-sites that are stretched or enlarged for specimen retrieval, and trocar sites in obese patients.

There are a number of methods of port-site closure but there is no gold standard. Use of traditional suturing techniques are difficult due to blind closure of the fascial defect.¹⁶ Varying degrees of success are achieved by modified hand suturing techniques.¹⁷⁻¹⁹ Finding the rectus sheath and suturing through the layers of a thicker abdominal wall through a relatively small hole is challenging particularly in the obese.^{13,16} In such cases, we need special instruments for efficient closure of the port-site. Veress needle is an instrument that is commonly used for creating pneumoperitoneum. In this study, veress needle has been used to close the port-site efficiently under vision.

AIM OF THE STUDY

To show Veress needle is a safe, efficient and cost-effective tool for port-site closure.

HISTORY OF VERESS NEEDLE

In 1938, Janos Veress of Hungary developed a specially designed spring-loaded needle. Interestingly, Veress did not promote the use of his Veress needle for laparoscopy purposes. He used Veress needle for the induction of pneumothorax.

But now Veress needle is the most important instrument today to create pneumoperitoneum.

PARTS OF VERESS NEEDLE

Veress needle consists of an outer cannula with a beveled needle point for cutting through tissues. Inside the cannula of veress needle is an inner stylet, stylet is loaded

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with a spring that spring forward in response to the sudden decrease in pressure encountered upon crossing the abdominal wall and entering the peritoneal cavity.

TECHNIQUES

1. Remove the stylet from the cannula.



2. Pass a suture material through the cannula from the tip



3. Tie the loop and hide the knot in the cannula

4. Insert the suture material (that should close the portsite) into the cannula tip about 2 cm deep and bend it so that it stays in place. Now it is ready.



5. Occlude the port-site with a finger so that the pneumoperitoneum is maintained and pass the Veress beside the finger through all the layers except the skin and subcutaneous tissue under vision.







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6. Retract the Veress and the suture is automatically retained inside.



7. Insert the Veress from the other side of the defect



8. Entangle the suture in the loop of the Veress



9. Tighten the loop and retract the Veress along with the suture and tie the knot.



Thus, the port-site is closed under vision and is a safe procedure.

MATERIALS AND METHODS

This is a retrospective study of 500 patients who underwent different laparoscopic procedures at World Laparoscopic Hospital, Gurgaon, from 2006 to till date.

DISCUSSION

Minimal access surgeries are the present and future of surgical procedures and no surgery is complete without port-site closure. There are a lot of methods to close the port-site but no gold standard. This study is to evaluate the safety, efficacy and cost-effectiveness of the procedure.

One of the preventable complications is port-site incisional hernias (PIHs), which could develop at any port-site, most frequently at the midline, possibly because of the absence of supporting muscle. The incidence of PIH is variable from center to center, depending on several factors including surgical technique and, of course, surgical experience.

The trocar diameter, trocar design, pre-existing fascial defects, and some operation and patient-related factors, direction of the port insertion, use of a drain, and the site of the port are the risk factors for development of PIH.²⁰ In obese and bariatric patients because of the larger preperitoneal space and elevated intra-abdominal pressure, the risk of formation of trocar-site hernia is greater.²¹ Size of the port is another major risk factor, and some authors advise closure of holes >5 mm at the fascial level.²²

In our study, all the port-sites of size 10 m or greater were closed using a Veress needle and a through followup was done and there has been no incidences of port-site hernia.

CONCLUSION

The meticulous closure of laparoscopic ports is important to prevent and reduce the chances of formation of portsite incisional hernia. Port-site closure by Veress needle is an efficient and safe technique done under vision and there is no need to buy additional equipment to close the port-site, thus cost-effective.

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