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Technical Notes

A Modified Technique of Laparoscopic Closed-Entry by the Veress Needle: A Novel, Unique, Rapid, and Simple Procedure

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ABSTRACT

Background: Gynecologists usually perform the laparoscopic closed-entry technique to access the intraperitoneal cavity, while general surgeons prefer the open-entry approach, which takes more time. This study aims to introduce and discuss the novel modified closed laparoscopic entry technique. This method involves cutting the fascia after the skin incision to allow only the Veress needle to enter, thus avoiding complications arising from the closed procedure. This approach may benefit safe and quick laparoscopic entry, especially for obese patients.

Method of Technique: The current approach, which we call the modified closed Veress technique (MCVT), is a modification of the previously defined Veress needle entrance method. After the skin is cut, the subcutaneous fat tissue is released with the Mosquito clamp, the muscular fascia is held and hung with the Kocher clamp, and the incision is created large enough to insert the Veress needle. Then, the Veress needle is passed through the parietal peritoneum, the final step before reaching the intraperitoneal cavity.

Results: In our Gynecology and Obstetrics clinic, the current technique for the first entrance to the intraperitoneal cavity was used in a total of 294 patients between the years 2019-2023. There were no intraoperative or postoperative complications associated with the current approach. Moreover, in 12 patients who failed with the standard closed technique, intraperitoneal gas charging was provided in the first trial with the MCVT.

Conclusion: Because it is possibly as safe as the open technique and as quick as the standard closed technique, the MCVT may be one of the alternative techniques for the first laparoscopic entry into the peritoneal cavity to prevent complications and save time. Nevertheless, more thorough and patient-based prospective randomized research is required on this topic.

Keywords: laparoscopic procedure, laparoscopic techniques, trocar insertion, umbilical port, Veress needle

INTRODUCTION

Laparoscopy is a frequent procedure in gynecological surgery to access the intraabdominal cavity through a small incision [1]. In contrast to typical open surgery, surgeons may not witness the first entry into the peritoneal cavity; consequently, most complications occur during this stage [2]. Although many different entry approaches have been reported, only two techniques are directly accepted as standard practice. First, the Hasson technique, generally known as the open procedure, involves creating a small umbilical incision under

visual inspection to access the intraabdominal cavity and then inserting a blunt trocar into it [3]. The process of first trocar insertion into the abdominal cavity with the Hasson open technique is completed in three to ten minutes [4]. The second is the closed-entry technique by the Veress needle-assisted or direct trocar-inserted. The Veress needle-assisted closed-entry procedure involves making a small incision in the skin with a scalpel and then inserting the needle directly into the peritoneal cavity until it makes a double-click sound. Once the Veress needle insertion has been completed into the peritoneal cavity, gas incubation is provided sufficiently. Finally, the first trocar is penetrated bluntly from the anterior abdominal wall to the level of cutting the fascia, muscle layers, and peritoneum, respectively [5]. In the Veress needle-assisted closed-entry technique, the first trocar insertion into the abdominal cavity is completed approximately 2-4 minutes [6]. Furthermore, the closed-entry technique by direct trocar is generally operated to reduce the entrance period and to identify possible early complications [7]. Although crucial vascular injuries are more prevalent in closed-entry laparoscopic procedures [8], visceral organ or minor vascular injuries are more frequent for open-entry technique, especially in the first trocar insertion [9].

Our Veress needle-assisted modified laparoscopic closed-entry technique, called the MCVT, was developed to prevent possible laparoscopic-entry complications and enter the intraperitoneal cavity more swiftly.

Surgical Technique and Patients

The MCVT is a modified version of the previously defined technique of laparoscopic closed-entry by the Veress needle. In the MCVT, the first of the two subcutaneous anterior abdominal layers may be incised safely; consequently, the remaining single peritoneal layer may be passed by the Veress needle with minimal force under the fascia.

The skin was incised approximately 8 mm from the inferior umbilicus to the caudal with the help of a scalpel number 11 (Figure-1). The subcutaneous fat tissue was dissected with the Mosquito clamp, and the muscular fascia was observed (Figure -2). After this stage, the grasping side of the Kocher clamp was opened parallel to the patient, and the fascia of the umbilicus was clamped and suspended up (Figure -3). Furthermore, an approximately 2 mm incision that was enough to insert the Veress needle at a 3 mm inferior from the muscular fascia suspended by the Kocher clamp was created by the number 11 scalpel (Figure-4). The Veress needle was moved into the intraperitoneal cavity using minimal strength through the incision; moreover, the insufflation of gas was performed after a single click sound that only pierced the parietal peritoneum (Figure -5). Finally, sufficient gas insufflation was achieved, the trocar was safely inserted into the abdomen, and the laparoscope was positioned.

Video 1. https://eurjther.com/index.php/home/article/view/1846/1452

A history of lower abdominal surgery, the status of pregnancy, not being in adulthood, and having a short distance between the anterior abdominal wall and the spine are the reasons for preference for the open-entry procedure. Nevertheless, the open-entry technique's efficacy is often limited due to the lateness of entry time, difficulty in pneumoperitoneum practice or maintenance, and obesity [7]. The history of a surgical mesh below the umbilicus was the only exclusion criterion for the MCVT approach in the current study. Finally, MCVT was performed on 294 cases in our clinic, and informed consent was approved for all included patients. This current study was carried out regarding the ethical standards of the Declaration of Helsinki guidelines.

RESULTS

The MCVT was performed on 294 cases between 2019-2023 in Gaziantep University Faculty of Medicine, Department of Gynecology and Obstetrics. The peritoneal cavity was entered in the first attempt by MCVT; further, there were no first-entry complications such as major vascular trauma or visceral organ injury for any included patients. Moreover, the standard Veress needle-assisted closed-entry technique for the first two attempts failed in 12 patients; on the other hand, the third attempt of these patients was successful with the MCVT approach, and then gas insufflation was provided to the intraperitoneal cavity.

Figure 1. Skin incision

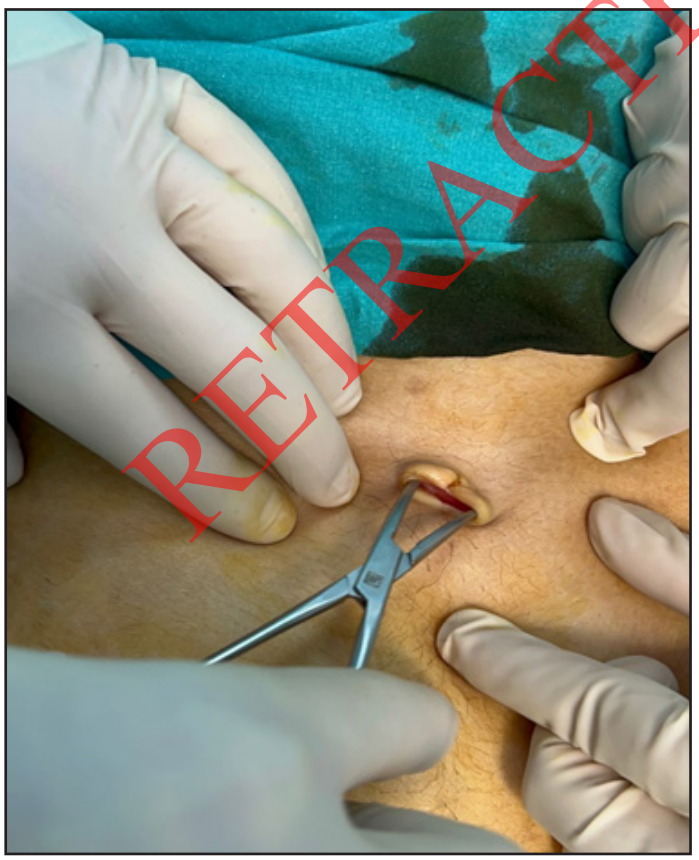

Figure 2. Removal of subcutaneous tissue

Figure 3. Retention of umbilical fascia with Kocher Clamp

Figure 4. Minimal incision to the suspended fascia

Figure 5. Entering the intraperitoneal cavity through the incision made in the fascia with a Veress needle

DISCUSSION

The mean insertion period of the first trocar into the intraperitoneal location with MCVT was 80 seconds in the study, which was advantageous compared to other traditional techniques. In addition, the MCVT's possible advantages over the standard closed approach were reducing complications such as retrying in the failure of first entry into the peritoneal cavity, major vascular trauma, and visceral organ injury. In the standard closed-entry technique by the Veress needle-assisted, the needle may not pass through the muscular fascia or the peritoneum on the first try, particularly for obese patients [10]; thus, the gas may accumulate in the subcutaneous tissue or peritoneum after insufflation. The failed Veress needle insertion efforts induce not only the development of complications but also increased rates of failed re-entry [11] A second attempt may be performed with MCVT in subcutaneous or peritoneal gas accumulation cases due to a failed first-entry experimentation. Because the muscular fascia incision was made too close to the final peritoneal layer in MCVT, the Veress needle may reach comfortably into the abdominal cavity by only passing one of the peritoneum layers. Consequently, the MCVT is frequently performed in our clinic because of advantages on the first attempt, such as faster and safer entering than the standard closed-entry technique, particularly in obese patients.

A single-center design and the insufficient number of included patients regarding the general population representation were limitations of the current study. Although the last layer of the peritoneum that opens into the abdominal cavity can be passed with minimal effort with MCVT, the sight of the intra-peritoneum may not be distinctly visible during the insertion of the Veress needle. Furthermore, the risk of complications is high in patients with internal organ adhesion to the anterior abdominal wall because of their previous surgery [2, 10, 11]. There were no complications in any cases in the current study; however, possible complications can develop in subsequent patients. Moreover, the Veress needle insertion region may be examined by ultrasonography for adhesions of intraabdominal tissue. Accordingly, the intraoperative ultrasonographic examination of the insertion area can be performed first to avoid some possible complications of MCVT. In the current study, some cases with suspected adhesions under the umbilicus had an ultrasonographic re-examination before MCVT.

CONCLUSION

The MCVT, a synthesis of other procedures, may be an alternative technique for the first entry trial into the peritoneal cavity in laparoscopy to avoid complications and save time. However, more comprehensive and patient-based prospective randomized research on this subject is highly required.

Conflict of interest: None.

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