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Brief Communication

First trocar entery in laparoscopic bariatric surgery; technical pearls and tricks

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Abstract

The first step in Laparoscopic surgery is the safe creation of a pneumoperitoneum, which is troublous in the bariatric patient. To reduce first port insertion-related complications, several techniques have been commenced during the last years. First Trocar insertion-related Complications can occur even by experienced surgeons and it is essential that these injuries are diagnosed early and immediately managed. In our experience, we use some steps in trocar entry to minimize trocar-related abdominal injuries.

Keywords

Bariatric Surgery, Laparoscopy, Pneumoperitoneum, Trocar, visual entry system

Introduction

entry into the abdomen is for insertion of surgical instruments through small holes into the abdominal cavity makes the first challenge for laparoscopic surgeons. Laparoscopic trocar placement is related to some injuries to the gastrointestinal tract and major blood vessels and about 50% of these injuries occur before the start of surgery. Interestingly, this complication has not decreased during the past 30 years. (1) if the surgeon fails to recognize and manage these injuries in the early stages of injury, morbidity, and mortality related to these complications may increase. The postoperative rather than intraoperative diagnosis of these lesions increases the intensity of the outcome as well as the medicolegal responsibility. (1)

Historically bariatric procedures had been performed by open incision but nowadays with the introduction of laparoscopic approaches these procedures are performed laparoscopically. There are many benefits of the

laparoscopic approach in comparison to the open approach such as the lower occurrence of incisional hernia, wound complications, and earlier hospital discharge.

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Laparoscopy in bariatric patients as well as other laparoscopic surgeries starts with the secure insertion of the first trocar to start a pneumoperitoneum. This step in bariatric patients is more challenging than others because of the thick abdominal wall in these patients. Some surgeons prefer using a tracheostomy hook in the incision line to uplift fascia to assist the insertion of the Veress needle into the abdominal cavity for pneumoperitoneum creation. The use of a Hasson approach in the bariatric population may be restricted because of the thick abdominal wall. (2-4) In a study in Finland, 256 port-related complications were reported in 70,607 laparoscopic procedures. The overall rate of major complications was 1.4 per 1,000 surgeries. This entailed 0.6, 0.3, and 0.1 per 1,000 in intestinal, urological, and vascular injuries respectively. another multicentric study in the Netherlands showed that the overall rate of intestinal injuries was 5.7 per 1,000 surgeries. Seventy percent of which were associated with the first port insertion. The overall rate of first port insertion-related injuries was 3.3 per 1,000. There were 29 gastrointestinal (1.3 per 1,000) and 27 intraabdominal vascular injury (1.05 per 1,000).(2, 3, 5)

To reduce first port insertion-related complications, several techniques have been commenced during the last years. These entail many techniques such as the open (Hasson) technique, the closed entry, use of the optical trocar, use of the Veress-pneumoperitoneum trocar; direct trocar insertion without prior pneumoperitoneum. Each of these methods has some popularity based on the surgeon's preference and experience. (3) In our experience, we use

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RECOMMENDATIONS

First of all, the patient must be completely evaluated, comprising a thorough clinical history and physical examination especially previous abdominal operations and incisions. Explicit elucidations must be explained about the risks and possible complications of laparoscopic surgery and the possibility of conversion to laparotomy. The surgeon must have sufficient experience in laparoscopic surgery before intending to carry out any laparoscopic procedure independently in addition to complete knowledge of the anatomy of abdominal wall layers and the usage of specific equipment and trocars he/she intends to use.

There is no solitary secure technique to diminish first port entry complications. The surgeon should pick out the best technique for the patient according to his/her experience. the high intraperitoneal (HIP-pressure) laparoscopic entrance may have a lower complication rate and The open (Hasson) technique and Palmer's point pneumoperitoneum may be chosen in obese patients with suspected peri-umbilical adhesions. (5)

SUGGESTED STEPS FOR SAFE ENTRY

1. Veress needle insertion 3 cm beneath the left subcostal region in the midclavicular line (Palmer's point)
2. Surgeon should feel 4 resistances.
    a. Subcutaneous fascia.
    b. Anterior rectus sheet.
    c. Posterior rectus sheet.
    d. Intra-Abdominal peritoneum (the resistance in this step is higher than in previous steps).
3. The gas flow should be low in this step and the surgeon should pay attention to the insufflation monitor and the gas flow and the resistance.
    a. Different Veress needle safety tests are not sensitive scale for the accurate intraperitoneal position of the Veress needle
    b. If the gas flow was zero and pressure high it means that the Veress needle is not in the peritoneal cavity.
    c. The most affirming indicator for accurate position of the Veress needle is to observe that the actual intra-peritoneal pressure is low and the gas flow is high without resistance.
    d. Excessive displacement of the Veress needle should be avoided because this will enlarge a small possible puncture site in the vessel or bowel.
4. for primary bariatric surgeries, usually, the first incision should be 10 to 12 cm below xiphoid angle in men and 12 to 14 cm in women, about 1 to 2 cm left to the midline.
5. Best lens for this step of the procedure is a zero-degree lens but some surgeons prefer to use a 30-degree lens, if the surgeon uses 30 degree, he/she should get the optical cord in a 2 o'clock position.
6. the operation table in the lowest position within the Parallel position.
7. Good harmony is very important in this step of the procedure
8. Check the optical port for any fracture in the port which could cause improper work.
9. adjust the focus of the optical trocar adhered to the incision line.
10. the optical trocar and lens should be placed vertically to the abdominal wall.
11. the surgeon should grip the lens with his/her left hand and optical trocar with his/her right hand.
12. with smooth perpendicular pressure to the abdominal wall with the left hand, the surgeon right-hand uses Rotational movements to cross the abdominal wall layers.
13. after crossing the subcutaneous fat layer, the surgeon crosses the anterior rectus sheet the rectus muscle, and then the posterior rectus sheet.
14. After crossing the posterior rectus sheet surgeon should change the direction of the

15. lens to the LUQ, Parallel to the abdominal wall.
16. After crossing the intra-abdominal peritoneum, the surgeon should push the trocar toward LUQ further to complete entrance in the abdomen.
17. After entrance these steps should be done;
    a. Check the Veress needle place in the abdomen to R/O any
    b. Change operating table position.
    c. Attach the gas pipe to the optical trocar
    d. Clean the lumen of the optical trocar.
    e. Clean the lens tip.
    f. Adjust the focus of the lens for intra-abdominal wall

CONCLUSIONS

It's a proverb between surgeons that the only surgeon who does not experience complications is the one who is not operating. All surgeries have their specific Complications. First Trocar insertion-related Complications can occur even by experienced surgeons and it is essential that these injuries are diagnosed early and immediately managed.

The importance of appropriate education of future laparoscopic surgeons is imminent. And it is important to teach them the best ways to do laparoscopy without complication and to diagnose complications early and manage them promptly.

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References:

1. Berch BR, Torquati A, Lutfi RE, Richards WO. Experience with the optical access trocar for safe and rapid entry in the performance of laparoscopic gastric bypass. Surgical Endoscopy And Other Interventional Techniques. 2006;20(8):1238-41.
2. Ertugrul I, Kayaalp C, Yagci MA, Sumer F, Karagul S, Tolan K. Comparison of direct trocar entry and Veress needle entry in laparoscopic bariatric surgery: randomized controlled trial. Journal of Laparoendoscopic & Advanced Surgical Techniques. 2015;25(11):875-9.
3. Kassir R, Blanc P, Lointier P, Tiffet O, Berger J-L, Amor IB, et al. Laparoscopic entry techniques in obese patient: veress needle, direct trocar insertion or open entry technique? Obesity surgery. 2014;24(12):2193-4.
4. Kosuta M, Palmisano S, Piccinni G, Guerrini J, Giuricin M, Nagliati C, et al. Safety of Veress needle insertion in laparoscopic bariatric surgery. Surgical Laparoscopy Endoscopy & Percutaneous Techniques. 2014;24(1):e1-e4.
5. Vilos GA, Ternamian A, Dempster J, Laberge PY. No. 193-Laparoscopic entry: a review of techniques, technologies, and complications. Journal of Obstetrics and Gynaecology Canada. 2017;39(7):e69-e84.