

Our Experience of Open Technique of Creating Pneumoperitoneum through Umbilical Cicatrix from a Remote Health Facility at Nepal

Aswini Kumar Misro, Prakash Sapkota, Radhika Misro

ABSTRACT

Background: Two methods have been used for peritoneal access to create pneumoperitoneum—the open and the closed technique. We are describing here an open technique of creating pneumoperitoneum through the umbilical cicatrix. We have been using this technique routinely in view of its safety, rapidity and technical ease.

Materials and methods: This method was used in 156 patients serially to create pneumoperitoneum. Patients were followed at 10 days, 3 months and 1 year interval.

Results: The time range was 22 to 540 seconds. The mean time taken was 85 seconds. More than 70% of the patients (n = 110) fell in the range of 22 to 80 seconds where as 36 were in the range of 80 to 100 seconds. Ten patients had the range of 100 to 540 seconds. There were no incidences of vessel or viscus injury even in reoperative cases. There were no cases of any major bleeding or hematoma. Two cases had wound infection which subsided with antibiotic and wound drainage. Out of 42 patients who have completed 3 months follow-up and 11 patients who have completed 1 year follow-up, none showed any port site hernia.

Conclusion: The open technique of creating pneumoperitoneum through the umbilical cicatrix is a safe and rapid technique.

Keywords: Open, Pneumoperitoneum, Laparoscopy, Umbilicus.

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INTRODUCTION

Open and the closed technique have been used by laparoscopic surgeons for peritoneal access to create pneumoperitoneum. We are describing here an open technique of creating pneumoperitoneum through the umbilical cicatrix. We have been using this technique routinely in view of its safety, rapidity and technical ease.

MATERIALS AND METHODS

In this technique, the umbilicus is caught with the help of two towel clips and traction is applied in an upward direction (Fig. 1). In this position palpation of the umbilicus is done to feel for its junction with the linea alba. Once the junction is identified, a skin crease incision is taken either in the

subumbilical or supraumbilical position depending on the operation contemplated. After careful hemostasis, the incision is deepened till the portion of the umbilical tube joining the linea alba is exposed and suitable retraction is applied to maintain this position and field of vision. With a no. 15 blade a small incision of around 5 mm is taken on the junction (Fig. 2). Care should be taken at this stage to complete this step under vision without introducing the blade too much inside. A blunt tipped hemostat is gently introduced through the incision (Fig. 3). A gushing noise can be heard at this juncture due to air entry inside the peritoneal cavity. This will widen the peritoneal space and



Fig. 1: Usual identification of the junction between umbilicus and anterior rectus sheath is very important



Fig. 2: The incision is placed on the junction of umbilicus and anterior rectus sheath

take the abdominal wall further away from the abdominal viscera. The stab wound should not be widened further as it is easy to maintain good air seal around a small wound. If the hemostat is going inside the peritoneal cavity without any undue resistance peritoneal access is almost certain. However, if the incision is too much away from the umbilical tube and sheath junction, a separate posterior sheath may be encountered. In this situation, one option is to dissect and incise the posterior sheath as well. Other option is to start fresh at the junction closing the former wound. The first port is then introduced directing toward the right shoulder while maintaining gentle upward traction on the anterior abdominal wall either by towel clips or manually (preferred) (Fig. 4). Once the peritoneal access and working ports have been introduced, careful laparoscopic survey of the port and underlying structures is carried out to rule out any inadvertent tissue injury. At the completion of the operation, the umbilical wound is routinely were closed in 2 layers—one for the sheath and other for the skin. In case of reoperative abdomen, a digital exploration might have to be performed prior to introduction of the hemostat. This widens the stab wound and creates air leak. One or two sutures beside the stab wound will help to reduce the wound size and prevent any major air leak afterwards.

This method was used in 156 patients serially to create pneumoperitoneum between 2008 and 2010 at our institute. Patients were followed at 10 days, 3 months and 1 year interval. The operating time, i.e. the time from skin incision to insertion of the first port was noted in all cases. Out of 156 patients, 90 were females and 66 were males patient. The age range was 16 to 74 years. 16 cases had reoperative abdomen. Majority of the patients (n = 115) had BMI range of 26 to 29 where as only 10 cases had BMI of 30 to 32. Twenty-six cases had BMI of 21 to 25. Various other parameters were also studied like bleeding, infection, visceral/vessel injury, incidence of failed trocar insertion and extraperitoneal insufflations. Although, port site hernia is one of the study parameters, it will require long-term follow-up to document its exact incidence.

RESULTS

The time range was 22 to 540 seconds. The mean time taken was 85 seconds. More than 70% of the patients (n = 110) fell in the range of 22 to 80 seconds where as 36 were in the range of 80 to 100 seconds. Ten patients had the range of 100 to 540 seconds. There were no incidences of vessel or viscus injury even in reoperative cases. There were no cases of any major bleeding or hematoma. Two cases had wound infection which subsided with antibiotic and wound drainage. Out of 42 patients who have completed 3 months follow-up and 11 patients who have completed 1 year follow-up, none showed any port site hernia.

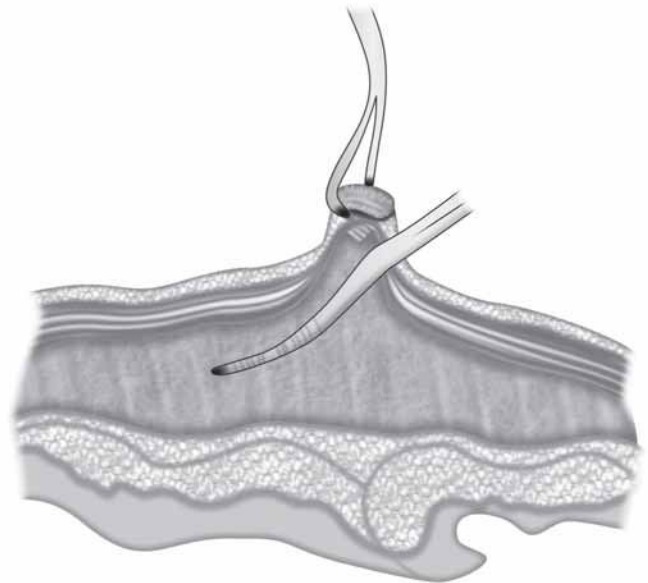


Fig. 3: Gently introduce a hemostat



Fig. 4: Maintaining an upward traction on the anterior abdominal wall either on the umbilicus with the towel clips or manually with hand grip (preferred), the first port is introduced

DISCUSSION

The open and closed technique exists in the armamentarium of the laparoscopic surgeons to create pneumoperitoneum. Although the European Association for Endoscopic Surgery (EAES) could not provide a conclusive guideline regarding use of either technique, they agree that major vascular injuries most often occur with the Veress needle approach. The reason for ambiguity in recommendation is inadequate sample size to find a difference in serious complications. Further, the meta-analysis by Merlin et al has demonstrated the safety of the open technique over the closed technique.¹

Several randomized control trials have already uncovered some of the additional advantages of open

technique namely reduced incidences of failed trocar entry and extraperitoneal insufflations.²

Traditional Hasson's technique, although safe especially in case of reoperative abdomen with adhesions, is time consuming.³ Secondly it is associated with frequent leaks. In contrast, open technique by direct trocar entry is faster than the closed counterpart.⁴

The time taken for creating pneumoperitoneum using our technique is only 85 seconds which is in sharp contrast with the average time taken for creating pneumoperitoneum using Veress needle technique 214 to 300 seconds.⁵⁻⁷ Moberg et al who have been using an almost similar technique since 1998 in 4,400 patients have reported their mean operating time to be 93 seconds.⁸ Although our mean operating time is 85 seconds, in more than 70% of the patients (n = 110) the time taken fell in the range of 42 to 80 seconds with a mean of 78 seconds. More time was required for the obese patients, increasing the overall mean operating time to 85 seconds.

The lack of any major vessel or viscus injury in this small group is encouraging and supports the safety of this technique, although it will require a lot more cases to elucidate its safety and long-term results. A distinct advantage of this technique is its application in case of reoperative abdomen where the incision can be widened to insert a finger to do digital palpation of any structure adhered to the incision and to do adhesiolysis, if required.

As mentioned previously, we had two incidences of extra-peritoneal insufflations. This was due to port insertion at a place away from the junction of the umbilicus and the linea alba where the peritoneum tends to remain as a separate layer. Hence, the port enters into the extraperitoneal space leading to extraperitoneal insufflation. Choosing the correct site of insertion avoids this problem.

Especially for the beginners starting laparoscopy, the closed technique of creating pneumoperitoneum requires some amount of adaptation of motor skills to learn the technique of blind first port insertion where as in open technique the first port is always under visual and tactile guidance. Secondly, the air entry before the port insertion makes sufficient space for safe port entry. The controlled

environment of open access technique under vision gives additional confidence to a beginner.

The open technique of creating pneumoperitoneum through the umbilical cicatrix is a safe and rapid technique.

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ABOUT THE AUTHORS

Aswini Kumar Misro (Corresponding Author)

Assistant Professor, Department of Surgery, Lumbini Medical College and Research Centre, Pravas, Tansen, Palpa, Nepal, Phone: 097775691344, e-mail: draswini@gmail.com

Prakash Sapkota

Lecturer, Department of Surgery, Lumbini Medical College and Research Centre, Pravas, Tansen, Palpa, Nepal

Radhika Misro

Medical Officer, Department of Surgery, Lumbini Medical College and Research Centre, Pravas, Tansen, Palpa, Nepal