ORIGINAL ARTICLE

Open Versus Closed Entry Techniques of Laparoscopy in Gynecological Practice

Sajida Parveen, Musharraf Jehan, Rahila Ramzan Valliani

ABSTRACT

Objective — *To compare open versus closed entry techniques of laparoscopy in order to determine the safety of either procedure in gynecologic practice.*

Study design — *Cross sectional study.*

Place & Duration of study — *Star General Hospital Karachi, from January 2010 to January 2012.*

Methodology — *Patients selected for the study were divided into two groups. In Group A open technique was used and in Group B closed technique was applied. Informed consent was taken from all the patients. Data were collected regarding age, time spent for the procedure in both the techniques, immediate and late complications. SPSS-Version16 was used for analysis.*

Results — *A total of 90 patients were recruited, 50 in group A and 40 in group B. Age of patients ranged between 25-45 year in group A and 25-37 year in group B. Time required for creating pneumoperitoneum was 6-17 minutes in group A and 6-10 minutes in group B. One (2%) patient had hemorrhage from primary port site in group A, primary port infection was observed in 20 (40%) patients in group A. Forty (80%) patients had gas leakage from primary port in group A. No patient had primary port hemorrhage, infection or gas leakage in group B. Time spent on wound closure ranged between 10-15 minutes in group A and 4-6 minutes in group B.*

Conclusion — *Closed entry technique was better and safer in terms of time spent, primary port site hemorrhage, gas leakage and primary port infection than open entry technique.*

Key words — *Laparoscopy, Pneumoperitoneum technique, Gynecologic practice.*

INTRODUCTION:

Despite all major technologic advances in laparoscopic surgery, the creation of pneumoperitoneum remains an important initial step.[1] Entry techniques to establish pneumoperitoneum at laparoscopy are matter of concern and subject of discussion.[2] To assess the peritoneal cavity, commonly two techniques are in practice, close peritoneal insufflations and open trocar placement.[3] Pneumoperitoneum is traditionally induced by Veress needle insertion at umbilicus followed by blind trocar placement at the same site.[4]

The technique of open laparoscopy was first described by Hasson in 1971.[2] The initial penetration of abdominal cavity to produce a pneumoperitoneum can be a hazardous task and insertion of the instrument can lead to injury to any viscera therefore surgeons look for expeditious, effective, reliable and safe technique to create pneumoperitonium.[3-5]

Correspondence:
Dr. Sajida Parveen
Department of Obstetrics & Gynecology
Baqai Medical University
Karachi
Email: safemother@yahoo.com

METHODOLOGY:

This was a cross sectional study conducted at Star General Hospital Malir Karachi. Patients operated from January 2010 to January 2012 were enrolled from Gynecology and Infertility clinic. Consecutive sampling method was used. These patients were scheduled for either diagnostic laparoscopy for

infertility work up or therapeutic laparoscopy for ovarian cyst, chocolate cyst and removal of ectopic pregnancy etc.

Those patients who were selected for laparoscopy but due to surgical difficulty ended up in laparotomy, were excluded. Ninety patients were selected for this study. Informed consent was taken. Fifty patients had pneumoperitoneum created by open method (group A) and 40 by closed method (group B). All procedures were done under general anesthesia.

For diagnostic infertility workup two trocars were used. One supraumbilical (10 mm) and second in left iliac fossa (5mm). For therapeutic gynecological procedure another10mm port was placed almost 5cm lateral to primary port on right side. In group A (open) a supraumbilical transverse 2cm incision was made. A small 1cm vertical incision was then made in rectus sheath and parietal peritoneum was picked up and held between two artery forceps. A small nick was given in peritoneum and cannula inserted. Carbon dioxide (CO_2) insufflation was then started. Inspection of peritoneal cavity was performed and any injury was recorded during creation of pneumoperitoneum. After completing the procedure in all patients layered wound closure was done.

In group B a supraumbilical transverse 1cm incision was made through the skin up to the subcutaneous tissue. Lower abdominal wall was lifted and Veress needle inserted. Veress needle was then attached to the insufflator. Any injury during blind insertion of needle and trocar, was noted. After completing the procedure only skin was closed with silk 0. Data were analysed using SPSS 16. Percentages, mean and standard deviations were calculated and p-value obtained using Chi-square test.

RESULTS:

A total of 90 patients were included. The age ranged from 25-45 year in group A and 25-37 year in group B. Time required for creating pneumoperitoneum was 6-17 minutes in group A and 6-10 minutes in group B. Mean time was 9.17±2.86 minutes in group A and 8.11±1.02 minutes in group B. No patient in group B (closed method) suffered from any injury during creation of pneumoperitoneum. One patient had hemorrhage from primary port site during creation of pneumoperitoneum in group A (p = 0.000). In the same group 40 (80%) patients had gas leakage from primary port site while gas leakage was not observed in group B (p = 0.000).

No patient had any visceral or vascular injury in both the groups. No patient had primary port infection in group B. Primary port infection was observed in 20 (40%) patients in group A (p = 0.000). There was no systemic or abdominal infection and subcutaneous emphysema observed in both the groups. Time spent on wound closure ranged from 10-15 minutes in group A and 4-6 minutes in group B. Mean wound closure time was 9.88±1.98 minutes in group A and 4.97±0.7 minutes in group B.

DISCUSSION:

Laparoscopic surgery has now became very popular for diagnosis and treatment of different gynecological conditions. One of the key steps in the procedure is induction of pneumoperitoneum, which is not physiological and has adverse hemodynamic and respiratory effects.[9,10] Iatrogenic injuries in laparoscopic surgery are still a problem confronted by surgeons.[11] Traditional closed method of pneumoperitoneum involves initial blind entry into abdomen and more than half of such injuries are related to this primary blind access and occur before the start of actual anatomic dissection.[12] To prevent these complications other methods were introduced like open technique and its different modifications.[3,7,13]

In our study we have applied a modified form of open method. Time required from incision to the introduction of telescope was less than in closed method. This is in accordance with other workers observations.[3,14] Closure time was also more in open method than closed method due to closure of rectus sheath. We have not observed any complication at the time of entry in closed method though others have reported complications with this technique.[14]

In our study leakage of gas during procedure was observed in 80% cases in open method, while this problem was not faced in closed method. For open method rate of gas leakage in literature ranged from 4.2% to 14.2%.[15] In our study, in open method, only one patient had abdominal wall bleeding at the time of creation of pneumoperitoneum but it was not associated with hematoma formation. No bleeding or hematoma was observed in closed method. Other workers have also observed few cases of infection and hematoma formation in abdominal wall associated with open method in their experience.[2] No visceral or intraabdominal vascular injury was observed in our study. Other workers have also not observed any injury by Veress needle.[16] But according to some other workers blind insertion of Veress needle has caused vascular and visceral injuries.[17] Open technique is favored by laparoscopic surgeons because if a visceral injury occurs it is immediately recognized and dealt with.[18]

Wound infection in primary port in open method was observed in 20 patients in our study while no primary

port infection was observed in closed method. Primary port infection is also observed in open method by others but was not statistically significant. No case of extra peritoneal insufflations was noted in both the groups in our study.

CONCLUSION:

Closed method to create pneumoperitoneum was better with respect to time taken, gas leakage and primary port infection and hemorrhage.

REFERENCES:

1. Jansen FW, Kolman W, Bakkum EA, deeKaroon CD, Trimbos Kemper TC. Trimbos JB. Complications of laparoscopy: An inquiry about closed versus open entry technique. Am J Obstet Gynecol. 2004;190:634-68.
2. Hasson HM. A modified instrument and method for laparoscopy. Am J Obstet Gynecol. 1971;110:886-7.
3. Ahmed G, Duffy JM, Phillips K, Watson A. Laparoscopic entry technique. Cochrane Database Sys Rev 2008,16(2):CD006583.
4. Shuja A, Ralphs DN. Pneumoperitonium; the effectiveness and intraperitoneal events while using veress needle. The Professional. 2004;11:349-52.
5. Mckernan JB, Champion JK. Access techniques: Veress needle- initial blind trocar insertion versus open laparoscopy with the Hasson trocar. Endosc Surg Technol. 1995;3:35-8.
6. Melzer A, Kipfmuller K, Groenemeyer D, Seibel R, Buess G .Ports, trocars / cannulae and access techniques. Semin Laparosc Surg. 1995;2:179-204.
7. Vilos GA, Teranamian A, Dempster J, Leberge PY. Laparoscopic entry: a review of techniques, technologies and complications. J.Obstet Gynecol Can. 2007:29:433-65.
8. Nuzzo G, Giuliante F, Tebala GD. Routine use of open technique in laparoscopic operations. J Am Coll Surg. 1997;184:58-62.
9. Schulze S, Lyng KM, Bugge K, Perver A , Bendtsen A ,Thorup J, et al. Cardiovascular and respiratory changes and convalescence in laparoscopic colonic surgery comparison between carbon dioxide pneumoperitoneum and gasless laparoscopy. Arch Surg.1999;134:1112-8.
10. Safran DM, Orlando R. Physiological effects of pneumoperitoneum. Am J Surg.1994; 167:281-6.
11. CatarcI M, Carlini M, Santioro E .Major and minor injuries during creation of pneumoperitoneum. A multi centre study of 12919 cases. Surg Endosc .2001;15:566-9.
12. Jansen FW, Kapiteyn K,Trimpos T, Herman J. Complications of laparoscopy a prospective multicentre observational study. Br J Obstet Gynaecol. 1997;104:595-600.
13. Molly D, Kalloo PD, Cooper M. Laparoscopy entry: a literature review and analysis of technique and complication of primary port entry. Aust NZ J Obstet Gynaecol. 2002;14:365-74.
14. Ballem RV, Rudomanski J .Techniques of pneumoperitoneum .Surg Laparosc Endosc 1993;3:42-3.
15. Gordon S, Maher P, Seman E. Open laparoscopy utilizing either a 5mm or 10mm standard intraumbilical trocar. Gynaecol Endosc. 2001;10:249-52.
16. Chapron C, Cravello L, Chopin N. Complications during set up procedures for laparoscopy in gynaecology: Open laparoscopy does not reduce the risks of major complications. Acta Obstet Gynaecol Scand. 2003;82:1125-9.
17. Lal P, Singh L,Agarwal PN, Kant R. Open port placement of the first laparoscopic port. A safe technique. J Soci Laparosc Surg. 2004;8:364-6.
18. Curet MJ. Special problems in laparoscopic surgery. Surg Clin North Am. 2000;80:1093-1107.