

Percutaneous trans-abdominal external needle for hernia defect closure in laparoscopic repair

Ahmed E. Lasheen, Salah AbdElaal, Mohammed Alkilany, Tamer Alnaimy, Amr Ibrahim, TahaBaiomy, Mohamed Abdel Hamid

ABSTRACT

Aims: Closure of hernia defect behind the mesh is essential for good results and making the procedure easy with laparoscopic hernia repair. Until now no defined technique is present. **Methods:** During the period from March 2012 through December 2014, during laparoscopic hernia repair in 27 patients, the hernia defect was closed before putting mesh by our technique. Where, the hernia defect was closed percutaneous trans abdominal by using spinal needle No. 18 or tip hole needle. The mean follow-up period was 26 months. **Results:** The ages of this patients group were ranged from 25 to 62 years (mean, 47 years). The mean time needed to put one suture was 1.7 minutes and number of sutures for good closure of hernia defect ranged from 2–7 interrupted sutures. No recurrence or mesh bulging or seroma formation or mesh infection was recorded in this patients group during the period of follow-up. **Conclusion:** Our technique for hernia defect closure during laparoscopic hernia repair is effective, easy and associated with good results.

Keywords: Percutaneous, Hernia defect closure, Laparoscopic repair, Percutaneous

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INTRODUCTION

Ventral hernias, whether naturally occurring or the results of previous surgery, comprise one of the most common problems confronting general surgeons, with overall incidence between 2% and 13% [1–3]. Laparoscopic ventral hernia repair was described on first by Leblanc in 1993 for all types of hernias [4]. Laparoscopic hernia repair has fewer wound complications, faster functional recovery and improved cosmeses [5, 6]. However, there are still some unresolved issues: a certain number of relapses, problems of fixation of the mesh, mesh bulging and migration, and seroma formation. Primary closure of the hernia defect is desirable to improve the laparoscopic hernia repair results, although technically complex, as shown by previous experience [5, 7]. We report our experience in primary hernia defect closure during laparoscopic hernia repair with percutaneous transabdominal external needle.

MATERIALS AND METHODS

This study was done in General and Laparoscopic Surgery Department, Zagazig University Hospital, Egypt,

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from March 2012 through December 2014. Twenty-seven patients were included in this research (20 patients inguinal hernias, 7 patients lateral ventral hernias; Table 1.) This research was discussed and approved from ethical committee of Zagazig University at January 2012. All information about the technique was discussed with all patients, and gave writing consent for inclusion of their data in this study. The ages of the patients ranged from 23 to 62 years (mean 47 years).

Surgical technique: Under general anesthesia, the patient is positioned supine with the arms alongside the body on an operating table tilting on all levels, to better expose the surgical field. The initial peritoneal access is by Veress needle puncture, 2 cm below the left costal margin in the midclavicular line (Palmer’s point) [8] to install the pneumoperitoneum of 14 mmHg has been achieved. A 0-degree, 10 mm laparoscope and two additional trocars of 5 mm in diameters were used. Careful and complete adhesiolysis represents the first time. Then, the peritoneum is incised superiorly, 3–4 cm above the hernia defect. After complete hernia sac dissection, the preperitoneal space exposure for 5–7 cm all around the hernia defect was achieved. Then, the hernia defect was closed through percutaneous transabdominal external needle [9] (using spinal needle No. 18 or tip hole needle [10]. The needle and prolene No. 0 inside it passed through the abdominal wall through the hernia defect wall to appear 1 cm from the edge of hernia defect. The prolene end was holed from the abdominal cavity and withdrawn outside the port. Then, this prolene end is holed by tissue forceps outside the port. Then, the needle and inside prolene were partial withdraw and redirected to pass through 1 cm from other edge of hernia defect. The other prolene end from inside the needle is holed by hook and brings it outside of abdominal cavity through the same port. Now, one suture is complete, which passed through both sides of hernia defect about 1 cm from hernia edge and under the floor of hernia defect, and two suture limbs outside the abdominal cavity through one port. The suture was tied extracorporeal and cut by laparoscopic scissor (Figure 1 A–D). Multiple sutures were put by same manner to produce good hernia defect closure. The intraperitoneal pressure is decreased during hernia defect closure. Then, suitable mesh was put at preperitoneal plane to cover the defect and 5 cm all around. The mesh fixation was achieved in it position using Glubran 2 (Gem srl, Viareggio, Italy) (Figure 2 A–F). The peritoneum was closed using Vicryl No. 2/0. The pneumoperitoneum was emptied under direct viewing and external pressure was applied to the hernia region and trocars sites were closed. Follow-up period ranged from 3 to 33 months (mean 26 months).

RESULTS

The mean surgical time was 60 minutes (ranged from 45–90 minutes). The mean time to put one suture was

1.7 minutes (ranged from 1–2 minutes). The number of sutures which needed to produce good closure of hernia defect ranged from 2–7 sutures. Twenty patients (74%) returned to their usual activities in two weeks and 7 patients (26%) required to one week. No seroma, or recurrence, or mesh bulging or chronic pain or infection was recorded in this patients group during the period of follow-up.

DISCUSSION

The increased acceptance of abdominal hernia repair by a laparoscopic approach has led to many confused reports on technique, results, and complications related to this procedure. Many of these complications are directly related to lack of thorough knowledge of surgical anatomy or improper technique. The complication rate after laparoscopic hernia repair vary from 5–13% but the definition of complication differs widely among studies [11, 12]. Sever bleeding usually due to vascular injury of big vessels and generally occurs because the using of staples during mesh fixation [13]. Patients who undergo laparoscopic hernia repair have 1.6 incidence of neuralgias due to nerve entrapment during mesh fixation with staples. Some surgeons advocated placing the mesh without fixation in preperitoneal space to avoid these complication [14], but primary hernia defect closure is vital for this manner. Two factors are predisposed for mesh bulging and hernia recurrence, firstly a loosely stretched the mesh and secondly present of hernia defect [15]. By closure of the hernia defect and restoring abdominal wall integrity will be leading to equalized pressure and tension across the abdominal wall and intra-abdominally placed mesh. Also, closure of hernia defect reduces the dead space preventing the formation of seromas [16, 17]. Previous researches [1, 7] has proposed the use of a straight needle or half circle for hernia defect closure with difficult maneuvers, knotting complicated, and incomplete closure and dead space obliteration. Our technique for closure of hernia defect used external needle

Table 1: Showing hernia types, hernia defect sizes, and number of sutures which needed to produce good closure by our technique.

Hernia number	Hernia type	Hernia defect size	Sutures number
20 patients	13 patients (Rt.O.I.H) and 7 patients. (Lt.O.I.H)	2–3 cm	1–2 sutures
7 patients	4 patients (incisional hernia after open App., and 3 patients (lumber hernia)	5–10 cm	3–5 sutures

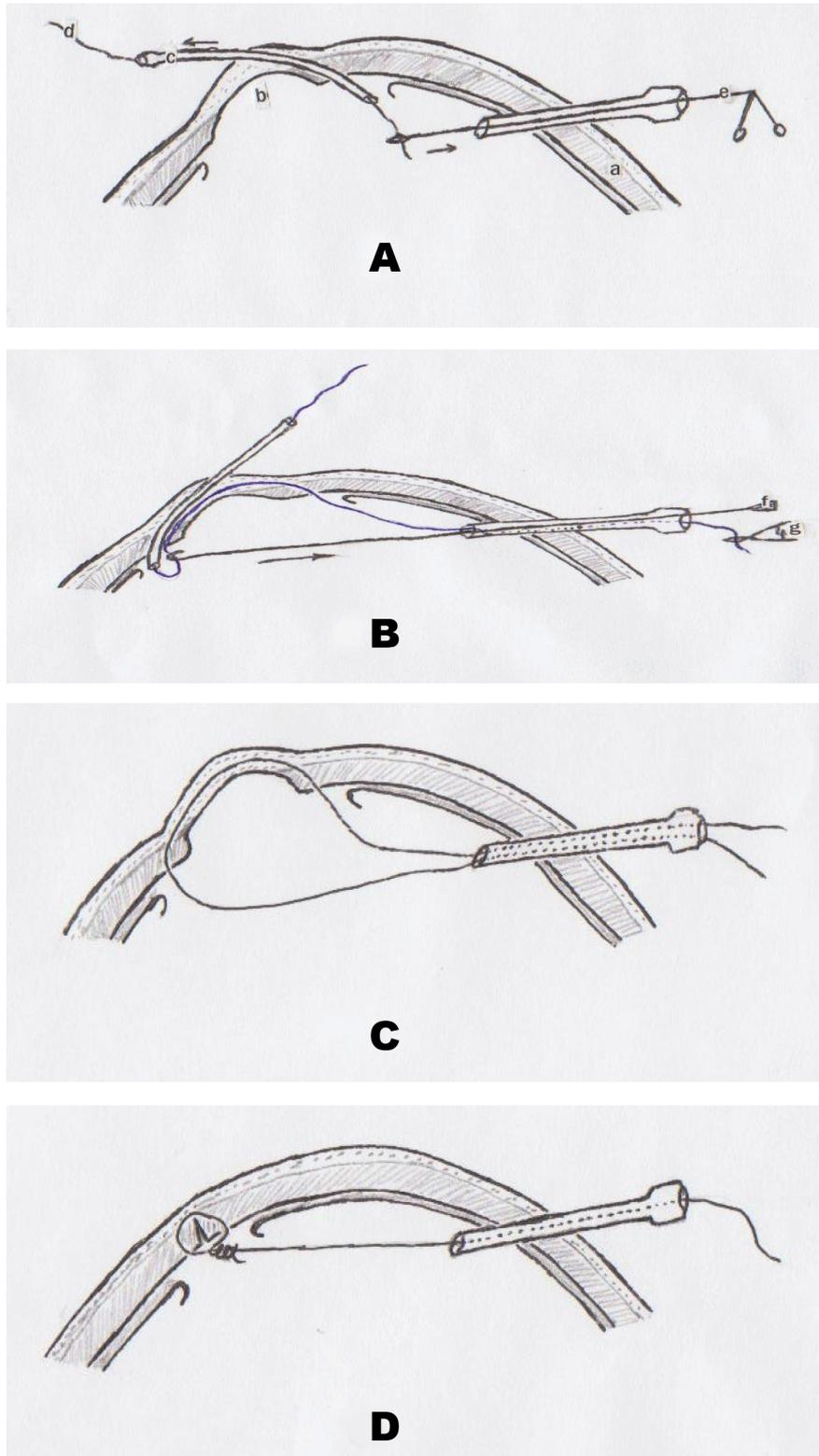


Figure 1: (A) a. anterior abdominal wall. b. Hernia defect. c. Spinal needle No. 18. d. Thread (prolene No. 0) inside the spinal needle. e. Laparoscopic grasper. The spinal needle and prolene inside it passed through anterior abdominal wall at the hernia region to appear at 1 cm from the edge of the hernia defect. Then, the inside end of prolene at peritoneal cavity is holed by laparoscopic grasper to bring it outside the abdominal cavity through one port. (B) g. Tissue forceps. f. Laparoscopic hook. The outside prolene end is holed by tissue forceps. The spinal needle is partial withdrawn and redirected to pass through the floor of hernia wall and appears at 1 cm of the other edge of hernia defect. By using laparoscopic hook the other prolene end is bring outside the abdominal cavity at the same port. (C) The two limbs of suture are present outside the port and suture passes through both hernia edges and under the floor of the hernia wall. (D) The suture was tied by extracorporeal knot which pushed by using claw forceps closing the hernia defect and complete obliteration of dead space at hernia area.

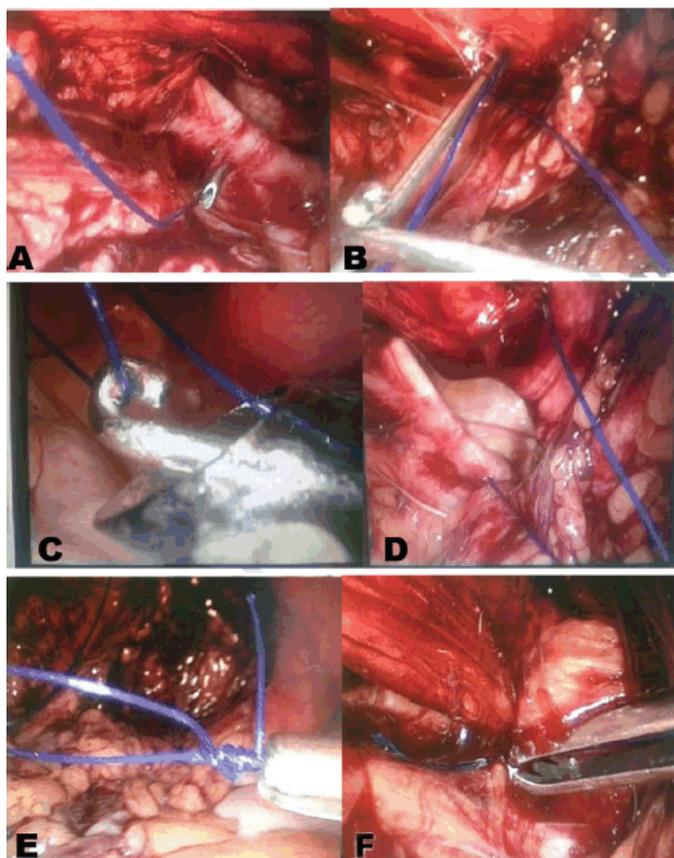


Figure 2: (A) The spinal needle and prolene inside passed through the hernia edge and the prolene end was holed by laparoscopic grasper to bring it outside the abdominal cavity through one port, (B) The spinal needle and prolene inside is partial withdrawn and redirected to pass through the other hernia edge. Then, the other end of prolene is holed by laparoscopic hook and brings it outside the abdominal cavity, though the same port, (C) The hook holed the other prolene end to pass through the port bring it outside the abdominal cavity. (D) The two limbs of suture outside the one port and suture passes through both hernia edges and under the floor of hernia defect, (E) Extracorporeal knot is pushed by laparoscopic claw to tie the suture, and (F) Extracorporeal knot is tied closing the hernia defect and complete obliteration of dead space at the hernia area.

(spinal needle No. 18 or tip hole needle) which passed with thread inside it through abdominal wall and abdominal cavity. By our technique it can be closed the hernia defect completely and by any number of sutures, and complete obliteration of dead space preventing seromas formation. The sutures were tied extracorporeally in our study.

CONCLUSION

Percutaneous transabdominal external needle technique for closure of hernia defect is easy, suitable for all types of laparoscopic abdominal hernia repair, and associated with good results.

Author Contributions

Ahmed E. Lasheen – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Salah AbdElaal – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

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Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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REFERENCES

1. Banerjee A, Beck C, Narula VK, Laparoscopic ventral hernia repair: Does primary repair in addition to placement of mesh decrease recurrence? *Surg Endosc* 2012 May;26(5):1264–8.
2. Lomanto D, Iyer SG, Shabbir A, Cheah WK. Laparoscopic versus open ventral hernia mesh repair: A prospective study. *Surg Endosc* 2006 Jul;20(7):1030–5.
3. Höer J, Lawong G, Klinge U, Schumpelick V. Factors influencing the development of incisional hernia. A retrospective study of 2,983 laparotomy patients over a period of 10 years. [Article in German]. *Chirurg* 2002 May;73(5):474–80.
4. LeBlanc KA, Booth WV. Laparoscopic repair of

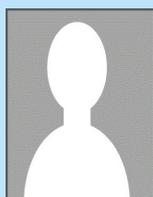
- incisional abdominal hernias using expanded polytetrafluoroethylene: preliminary findings. *Surg Laparosc Endosc* 1993 Feb;3(1):39–41.
5. Orenstein SB, Dumeer JL, Monteagudo J, Poi MJ, Novitsky YW. Outcomes of laparoscopic ventral hernia repair with routine defect closure using “shoelacing” technique. *Surg Endosc* 2011 May;25(5):1452–7.
 6. Melvin WS, Renton D. Laparoscopic ventral hernia repair. *World J Surg* 2011 Jul;35(7):1496–9.
 7. Elazary R, Abu-Gazala M, Schlager A, Trans-fascial laparoscopic mesh fixation: a procedural comparison using the standard suture passer versus iMESH stitcher™ device. *Hernia* 2011 Jun;15(3):321–4.
 8. Sharma A, Mehrotra M, Khullar R, Soni V, Baijal M, Chowbey PK. Laparoscopic ventral/incisional hernia repair: a single centre experience of 1,242 patients over a period of 13 years. *Hernia* 2011 Apr;15(2):131–9.
 9. Lasheen AE, Safwat K, Morsy M, Allam Z, Awad W. Modified transabdominal external needle for mesh size estimation in laparoscopic hernia repair. *Int J Surg* 2014 Oct;12(10):1074–6.
 10. Lasheen AE, Elzeftawy A, Ahmed AH, Lotfy WE. Anatomical closure of trocar site by using tip hole needle and redirecting suture hook. *Surg Endosc* 2010 Oct;24(10):2637–9.
 11. Kosai N, Sutton PA, Evans J, Varghese J. Laparoscopic preperitoneal mesh repair using a novel self-adhesive mesh. *J Minim Access Surg* 2011 Jul;7(3):192–4.
 12. Fitzgibbons RJ Jr, Camps J, Cornet DA. Laparoscopic inguinal herniorrhaphy. Results of a multicenter trial. *Ann Surg* 1995 Jan;221(1):3–13.
 13. Miguel PR, Reusch M, daRosa AL, Carlos JR. Laparoscopic hernia repair—complications. *JLS* 1998 Jan-Mar;2(1):35–40.
 14. Hakeem A, Shanmugam V. Effectiveness of multiple neurectomies to prevent chronic groin pain after tension-free hernia repair. *Int Surg* 2011 Apr-Jun;96(2):162–3.
 15. Schoenmaeckers EJ, Wassenaar EB, Raymakers JT, Rakic S. Bulging of the mesh after laparoscopic repair of ventral and incisional hernias. *JLS* 2010 Oct-Dec;14(4):541–6.
 16. Sodergren MH, Swift I. Seroma formation and method of mesh fixation in laparoscopic ventral hernia repair—highlights of a case series. *Scand J Surg* 2010;99(1):24–7.
 17. Tsimoyiannis EC, Tsimoyiannis KE, Pappas-Gogos G, Nikas K, Karfis E, Sioziou H. Seroma and recurrence in laparoscopic ventral hernioplasty. *JLS* 2008 Jan-Mar;12(1):51–7.

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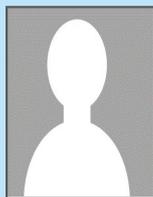
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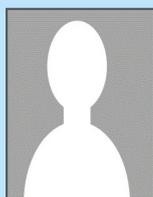
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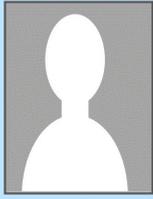
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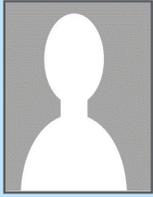
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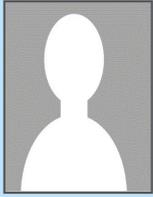
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