Laparoscopic transabdominal preperitoneal inguinal hernia repair

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Background
The laparoscopic transabdominal preperitoneal (TAPP) inguinal hernia repair is an evolving technique associated with well-known advantages of a minimally invasive approach. The present prospective randomized study was conducted to assess the feasibility and safety of performing laparoscopic TAPP repair.

Patients and methods
The present prospective randomized study was conducted between April 2009 and March 2011 and included 45 patients suffering from uncomplicated primary groin hernia who underwent TAPP repair. Intraoperative incidents, postoperative pain, complications, and recovery in general as well as patient satisfaction at follow-up examination were prospectively recorded.

Results
There was no injury to vas deferens, other cord structures, or bladder. Eight of the 45 patients developed seroma during the immediate postoperative period. Pain medication was given once to all patients on the first postoperative day. During postoperative follow-up for 24 months, no recurrence was detected.

Conclusion
TAPP repair is a feasible and safe technique, resulting in less postoperative pain and less postoperative complications; we recommend it as a procedure of choice especially in recurrent and bilateral cases.

Keywords:
inguinal hernia, laparoscopy, TAPP

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Introduction

Inguinal herniorrhaphy is one of the most common operations that general surgeons perform [1]. The first sound technique for the repair of inguinal hernia was described by Bassini in 1887. Since that time, more than 70 methods have been introduced [1]. Today, only three techniques have been scientifically validated and can be recommended for clinical application:

(a) The Shouldice technique, a form of suture repair,
(b) Open anterior flat mesh repair according to Lichtenstein, and
(c) Laparoscopic/endoscopic posterior flat mesh repair [2].

Following the laparoscopic revolution, laparoscopic hernia repair has become one of the commonest laparoscopic operations. Several studies have demonstrated a definite advantage over open repair with respect to reduced postoperative pain [3] and earlier return to work and normal activities [4].

There are two standardized techniques of laparoscopic inguinal hernia repair: transabdominal preperitoneal (TAPP) repair, described by Arregui *et al*. [5] in 1992, and total extraperitoneal repair, described by Mckernan and Lawa [6] in 1993. TAPP is relatively easy to learn but has the disadvantage in that the peritoneal cavity is breached.

Patients and methods

This prospective observational study was carried out in Surgery Department at Sohag University Hospital from April 2009 to March 2011. All fit patients scheduled for elective inguinal hernia repair were offered the choice of the laparoscopic TAPP repair under general anesthesia. A detailed explanation of the procedure was given to all patients, and informed consent was obtained. Exclusion criteria included large scrotal hernias, complicated cases, ascitic patients, and patients with coagulation defects. Patient's demographic data are shown in Table 1.

Preoperative preparation

A broad-spectrum antibiotic was given intravenously as antibiotic prophylaxis with induction of anesthesia. Urinary catheterization was performed with Foley catheter in all patients.

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Operative procedure

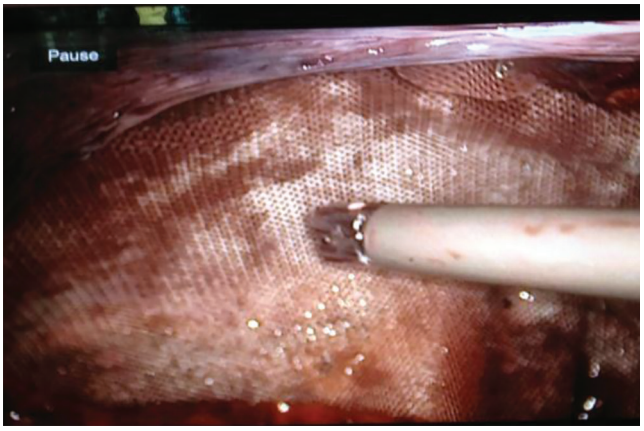
The procedure was performed with the patient under general anesthesia. The patient was placed in the supine position. Pneumoperitoneum from 12 to 15 mmHg was reached with CO_2 using a Veress needle. A standard 10-mm trocar was placed 2 cm above the umbilicus for insertion of the laparoscope. Two additional 5- and 10-mm trocars were placed lateral to linea semilunaris on either side of the umbilicus. The contents of the hernia were reduced into the abdomen. The peritoneum was incised starting 1 cm above the anterior–superior iliac spine, extending transversely medially until the median umbilical ligament to enable the formation of peritoneal flaps. Inferiorly, the peritoneal flap was dissected to identify the cord structures, triangle of doom, and psoas major muscle. After the dissection, a polypropylene mesh measure 15 × 15 cm was tailored, rolled, and introduced through the 10-mm port into the created space.

The mesh was then unrolled to cover the entire myopectineal orifices on the affected side (covering the femoral, direct, and indirect sites of the hernia) (Fig. 1). The mesh was anchored to cooper's ligament both superomedially and superolaterally using a mesh endostapler (Fig. 2a and b). Because of potential nerve injury, staples should not be placed in the inferolateral region. The peritoneal defect was closed with absorbable suture or staples (Fig. 3). The port sites were closed without drainage (Fig. 4).

Table 1 Demographic and types of hernia

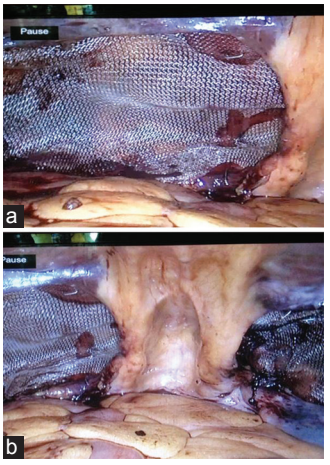
Patients	*N* = 45
Age (years) (mean ± SD)	43.32 (±15.16)
Male/female	45/0
Bilateral hernias (%)	3 (6.67)
Recurrent hernias (%)	2 (4.44)
Indirect hernias (%)	32 (71.11)
Direct hernias (%)	11 (24.44)

Figure 1



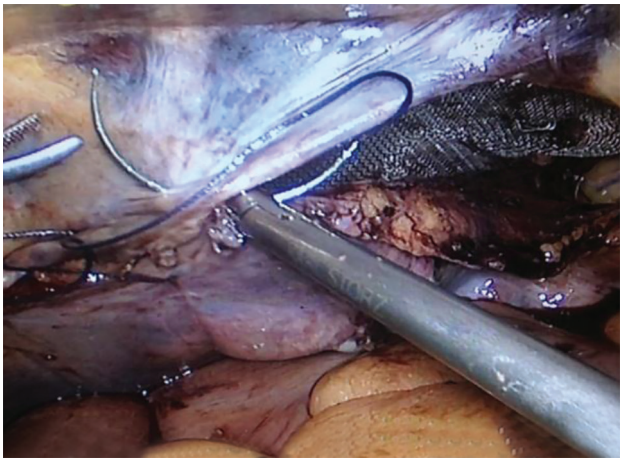
The mesh over myopectineal orifices.

Figure 2



Fixation of the mesh with endostapler (a and b).

Figure 3



Closure of the peritoneal defect with absorbable suture.

Figure 4

Closure of the port site.

Postoperative and follow-up

Assessment of intensity of postoperative pain was evaluated according to the visual analogue scale (VAS) [7]; this scoring system is graded from 0 to 10, where 0 = none or no pain, VAS 1–3 = mild pain, VAS 4–6 = moderate pain, and VAS 7–10 = severe pain. Nalbufen (20 mg) ampoule was the standard analgesic for all patients on the postoperative day 1.

Follow-up was performed at 1 week then at 1, 3, 6, 12, 18, and 24 months. Cosmetic outcome was analyzed using patient's satisfaction score, which was performed by the verbal rating scale [8], with 0 = not at all, 1 = poorly satisfied, 2 = average satisfaction, and 3 = good satisfaction. The presence or absence of seroma, pain, numbness, and recurrence was recorded.

Results

A total of 45 consecutive male patients with uncomplicated inguinal hernias were prospectively randomized to TAPP repair. The demographic data are shown in Table 1.

Surgical outcome

There was no injury to vas deferens, other cord structures, or bladder. No major vascular or bowel injury was found during dissection or insertion of ports. Bleeding was graded as minimal in all patients. The operative time for unilateral hernia was 61.60 (±27.40) min and was 82.52 (±22.73) min for bilateral hernia. There were no conversions to open repair. Early postoperative complications included eight patients (17.7%) who developed scrotal seroma, which improved spontaneously except in two patients (4.44%) who necessitated a single aspiration under complete aseptic conditions.

Postoperative pain

Assessment of intensity of postoperative pain was evaluated according to the VAS. There were early postoperative severe pain in five patients (11%), 10 patients (22%) developed moderate pain, and 30 patients (67%) had mild pain. During 1-month follow-up period, there was moderate pain in five patients (11%) and mild pain in 15 patients (33%); by the end of the third month, there were only five patients with mild pain. The follow-up period ranged from 18 to 24 (± 21.43) months. During this period, no pain, seroma formation, or recurrence were noticed in any patient. Follow-up was performed at 7 days and at 1, 3, 6, 12, 18, and 24 months (Table 2).

Patient satisfaction

Patient's satisfaction was recorded at the end of third postoperative month using a verbal rating scale of 0–3. During that time, 30 (75%) of the 40 followed up patients were graded 3, four (10%) were graded 2, and six (15%) were graded 1 satisfaction [8].

Discussion

Inguinal hernia repairs have a recurrence rate and long-term morbidity rate [9]. The search for the (gold standard) repair continues. Open mesh repair (Lichtenstein) [10] has been the standard of care since the 1980s until laparoscopic techniques to repair inguinal hernias were standardized [11]. Laparoscopic hernia repair was first described by Ger *et al.* [12] in 1990, who placed a simple mesh plug in the defect.

The technique has undergone a significant metamorphosis during the last few years. Currently, there are two types of laparoscopic hernia repair: the TAPP repair and the totally extraperitoneal repair. TAPP repairs were preferred as they are technically easier, provide a better view of the anatomy, and do not require further equipment beyond that normally available in most departments performing laparoscopic procedures. Several studies have demonstrated a clear advantage of laparoscopic hernia repair over open repair in terms of reduced postoperative pain and earlier return to work and normal activities [13].

Pain

Pain is the most common complaint after hernia surgery [14]. In agreement with the review published

Table 2 Postoperative follow-up of patients

	7 days *N* = 45	1 month *N* = 45	3 months *N* = 40	6 months *N* = 40	12 months *N* = 32	18 months *N* = 32	24 months *N* = 30
Seroma [n (%)]	8 (17.7)	3 (6.6)	0	0	0	0	0
Pain							
No pain 0	0	25	35	40	32	32	30
Mild 1–3	30	15	5	0	0	0	0
Moderate 4–6	10	5	0	0	0	0	0
Severe 7–10	15	0	0	0	0	0	0
Recurrence	0	0	0	0	0	0	0

by Nienhuijs *et al.* [15], a large number of studies demonstrate less pain after laparoscopic hernia repair when compared with open repair [16]. In this study, chronic pain ranged from 20% when getting up to 40% when walking of patients complained of groin pain. At 1 year after TAPP, the frequency of chronic pain was decreased to 4.4–6.6%.

Visceral injury

Studies have reported an intraoperative bowel injury rate of 0–0.06% in laparoscopic hernia repair [17]. In the present study, there were no bowel, major vascular, or bladder injuries.

Seroma

Seroma is a common postoperative occurrence after laparoscopic inguinal hernia repair. Because it mimics a postoperative recurrence of the hernia, seroma has been a concern to patients. The incidence of seroma ranges from 1.9 to 11% [18]. The incidence of seroma in our series was 17.7% (eight patients) after the first postoperative week, but it was only 6.6% (three patients) at the end of the first month. Only two patients required aspiration once and the seroma resolved without any intervention in the other six patients. Expectant treatment with observation appears to be effective in the management of seromas and scrotal edema in the majority of patients.

Recurrence

Recurrence is the most important end point of any hernia surgery. It requires a proper and thorough knowledge of anatomy and a proper technique of repair to keep the recurrence in endoscopic repair to a minimum [19]. For many years recurrence was the only criterion by which the quality of hernia repair was measured. Fitzgibbons and Puri [20] concluded that the factors leading to recurrence include surgeon inexperience, inadequate dissection, insufficient prosthesis size, insufficient prosthesis overlap of hernia defects, improper fixation, prosthesis folding or twisting, missed hernias, or mesh lifting secondary to hematoma formation. The reported incidence of recurrence after TAPP was around 0–3% [21]. In the present study, we did not notice any recurrence during the early postoperative period or during follow-up.

Conclusion

TAPP repair is a feasible and safe technique, resulting in less postoperative pain and less postoperative complications; we recommend it as a procedure of choice especially in recurrent and bilateral cases.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

References

1 Satod D, Yawal T, Jalgaon D. Laparoscopic vs open repair of inguinal hernia. World J Laparosc Surg 2008; 1:41–48.

2 Matthems RD, Neumayer L. Inguinal hernia in 21st century: an evidence-based review. Curr Probl Surg 2005; 45:261–312.

3 Wellmood J, Sculpher MJ, Stoker D, Nicholls GJ, Geddes C, Whitehead A, *et al.* Randomised controlled trial of laparoscopic versus open hernia repair for inguinal hernia: outcome of cost. Br Med J 1998; 317:103–110.

4 Kiruparan P, Pettit SH. Prospective audit of 200 patients undergoing laparoscopic inguinal hernia repair with follow up from 1 to 4 years. J R Coll Surg Edinb 1998; 43:13–16.

5 Arregui ME, Davis GJ, Yucel O, *et al.* Laparoscopic mesh repair of inguinal hernia using a preperitoneal approach: a preliminary report. Surg Laparosc Endosc 1992; 2:53–58.

6 Mckernan JB, Lawa HL. Laparoscopic repair of inguinal hernias using a totally extraperitoneal prosthetic approach. Surg Endosc 1993; 7:26–28.

7 Olmi S, Scaini A, Erba L, Guaglio M, Croce E, *et al.* Quantification of pain in laparoscopic transabdominal preperitoneal (TAPP) inguinal hernioplasty identifies marked differences between prosthesis fixation system. Surgery 2007; 142:40–46.

8 Loss MJ, Houterman S, Scheltinga MR *et al.* Evaluating postherniorrhaphy groin pain: visual analogue or verbal rating scale? Hernia 2008: 12:147–151.

9 Comps J, Nguyen N, Annabali R, *et al.* Laparoscopic inguinal herniorrhaphy: transabdominal techniques. Int Surg 1995; 80:18–25.

10 Lichtenstein IL, Shulman AG, Amid PK, *et al.* The tension-free hernioplasty. Am J Surg 1989; 157:188–193.

11 Ferzli G, Masaad A, Albert P, Worth MH, *et al.* Endoscopic extraperitoneal herniorrhaphy versus conventional hernia repair: a comparative study. Curr Surg 1993; 50:291–294.

12 Ger R, Monroe K, Duvivier R. Management of indirect inguinal hernias by laparoscopic closure of the neck of the sac. Am J Surg 1990; 159:370–373.

13 Neumayer L, Giobbie-Hurder A, Jonasson O. Open mesh versus laparoscopic mesh repair of inguinal hernia. N Engl J Med 2004; 350:1819–1827.

14 Lau H, Patil NG, Yuen WK, Lee F, *et al.* Prevalence and severity of chronic groin pain after endoscopic totally extraperitoneal inguinal hernioplasty. Surg Endosc 2003; 17:1620–1623.

15 Nienhuijs S, Staal E, Stobbe L, *et al.* Chronic pain after mesh repair of inguinal hernia: a systemic review. Am J Surg 2007; 194:394–400.

16 Simons MP, Aufenacker T, Bay-Nielsen M, Bouillot JL, Campanelli G, Conze J, *et al.* European hernia society guide lines on the treatment of inguinal hernia in adult patients. Hernia 2009; 13:343–403.

17 Felix EL, Harbertson N, Vartanian S. Laparoscopic hernioplasty: significant complications. Surg Endosc 1999; 13:328–331.

18 Lepere M, Benchetrit S, Debaert M, Detruit B, Dufilho A, Gaujoux D, *et al.* A multicentric comparison of transabdominal versus totally extra peritoneal laparoscopic hernia repair using PARIETEX meshes. JSLS 2000; 4:147–153.

19 Wellwood J, Sculpher MJ, Stoker D, Nicholls GJ, Geddes C, Whitehead A, *et al.* Randomised controlled trial of laparoscopic versus open mesh repair of inguinal hernia: outcome and cost. BMJ 1998; 12:317–331.

20 Fitzgibbons RJ, Puri V. Laparoscopic inguinal hernia repair. Am Surg 2006; 72:197–206.

21 Weiser HF, Klinge B. Endoscopic hernia repair experiences and characteristic features. Viszeralchirurgie 2000; 35:316–320.