



Inguinal Hernia Repair, Lichtenstein vs. Laparoscopic Approach: Prospective Study (2014-2018)

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Abstract

Background: Inguinal hernia repair is one of the most frequently performed surgical procedures worldwide. However, the most ideal surgical technique for inguinal hernia has not yet been defined between open-mesh repair and laparoscopic mesh approach. According to many centers, the best surgical approach for inguinal hernia remains the approach that the surgeon is skilled to perform.

Methods: We randomly enrolled patients from our Surgical Department, presenting with unilateral inguinal hernia, shifted either to open mesh repair or to laparoscopic mesh repair. The inclusive criteria were: patients with primary unilateral inguinal hernias were divided in two groups accordingly they were shifted to Total Extraperitoneal Repair (TEP) or to open mesh repair. We recorded for each age, gender as well as postoperative outcome. The study period was for 5 years i.e. from 2014 to 2018. Patient's characteristics are defined in Table 1.

Results: A total of 2321 patients with inguinal hernia was enrolled, most of them were males, 974 (42%) of them underwent TEP hernia repair vs. 1350(58%). Regarding the postoperative outcome, patients from TEP group have noticed decreased EP pain (0%, 15% vs. 4%, 21%), urinary retention 0%, 07% vs. 2%, 77%, chronic groin pain was similarly noticed in both group with no significant difference (0%, 07% vs. 0%, 10%), chronic groin numbness was not noticed in both group, and there was no significant difference regarding recurrent rate in the two patients groups. Furthermore the cost of TEP procedure was increased in 10% (Figures 1-4). We also noticed that the TEP was performed 12 min faster than the open procedure.

Conclusion: In case of unilateral, first-time hernia, both open mesh and laparoscopic mesh repairs offer excellent results, the choice depends on the surgeon skill as well as on the patient preference relative to his economical ability.

Keywords: Inguinal hernia; Open repair; Total extraperitoneal repair (TEP); Mesh; Fixation

Introduction

From its first description by Ger and colleagues in 1990, laparoscopic inguinal hernia repair has been regarded as an alternative to the traditional open mesh repair for most of new generation's surgeons [1,2]. Despite many centers dogmatize that laparoscopic repair of inguinal hernia is well suited for all types of adult groin hernia, controversies still coexist since the results of open mesh repairs are similarly good, and the learning curve of laparoscopic technique is more laborious [3-5]. This minimally invasive approach should however, be used with caution in some cases such as lower abdominal surgery, abdominal radiotherapy or bleeding tendency, giant irreducible hernia [6-8]. A balanced opinion is that both laparoscopic and open techniques play an important role in the successful management of inguinal hernia [8-10]. Thus, this prospective study aims to balance the two surgical approaches for inguinal hernia repair (open/TEP), in the terms of ergonomic condition, cost as well as postoperative outcome.

Total Extraperitoneal Repair (TEP) Technique

Under general anesthesia, in supine position, both arms tucked. The surgeon stands on the side opposite of the hernia to repair. The Trendelenberg position allows the peritoneum and viscera to fall away from the operative field. The monitor is positioned at the foot of the bed in contra lateral side of the groin hernia to repair. Scrub the abdominal surface with betadine solution, then a 1 cm, 5 cm to 2 cm skin incision is done below the umbilicus; dissect the subcutaneous adipose tissues using the S-retractor until visualization of the aponeurosis of the rectal muscle. Perform a 2 cm of

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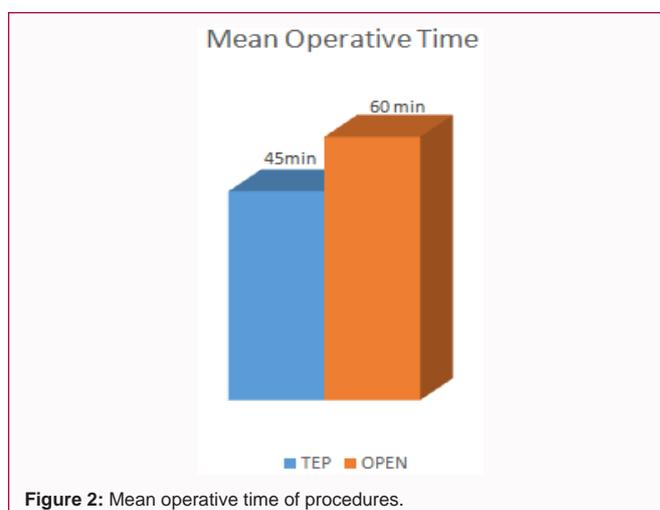
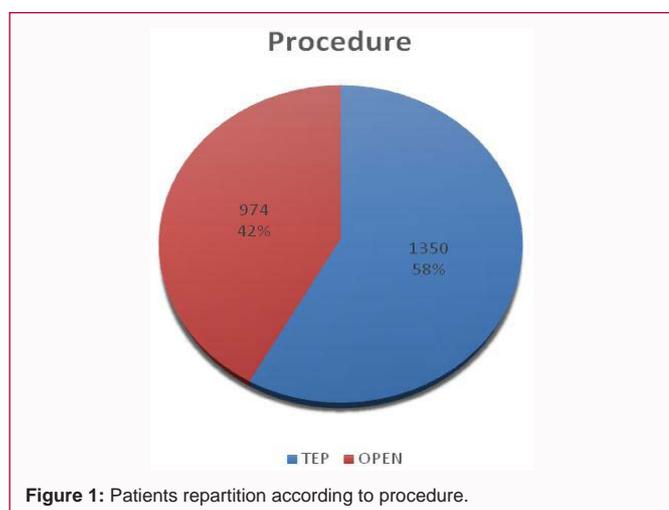
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Table 1: Patients characteristics.

Period	Procedure	No	Median Age	Gender	IOE	Postoperative outcome	
2014 to 2018	TEP	n=1350	Age: 59	M: 1341	Bleeding:1	EP Pain: 2	MTR to work 3 days to5 days
				F: 9		UR: 1	
			MOT: 46		Vascular inj: 0	CG Pain: 1	
					UBI: 0	CG Numbness: 0	
							Recurrence: 27
	OPEN	n=974	Age: 62	M: 962		EP Pain: 41	MTR to work 7 days to10 days
				F: 12	Bleeding: 0	CG Numbness: 0	
			MOT: 60		Vascul Inj:0	UR: 27	
				UBI: 0	CG pain: 1		
						Recurrence: 20	
Total		N=2324					

Abbreviations: MO Cost: Mean Operative Cost; MOT: Mean Operative Time; Vascular injury; UBI: Urinary Bladder Injury; EP Pain: Early Postoperative Pain; UR: Urinary Retention; CG Pain: Chronic Groin Pain; CG Numbness: Chronic Groin Numbness; MTR to Work: Mean Time of Return to Work; IOE: Intra-Operative Event



this aponeurosis with a blade and the two flaps are held with Kocher’s forceps. Thus, the anterior rectal sheath opened and the rectal muscle is retracted laterally with the S-retractor. The posterior rectus sheath is seen and left intact. At this step, some surgeons insert an 11 mm balloon-tip port to develop the preperitoneal space, but in our Department we directly insert the Hasson’s trocar to start the blunt dissection after inducing a prepneumoperitoneum with dioxide of carbon with partial pressure of 12 mmHg. Then place two 5 mm ports in the lower midline under direct vision using a scope of 0 degree. Alternatively, first bluntly dissect the lateral space after the first 5 mm port is inserted and then place the second 5 mm port in between the pubic bone and the former port [7,8].

After the two 5 mm ports are placed the dissection starts using two blunt and atraumatic graspers, the inferior epigastric vessels, the pubic bone and cooper’s ligament are identified. This dissection should be done under direct vision to avoid injury to the small veins that overlie the pubic bone and the bladder. As cooper’s ligament is exposed, a direct hernia if present will automatically be reduced and pseudosac may be found. Indirect hernia sacs are found on the anterolateral side of the cord. When dissecting the sac, it is important to minimize trauma to the vas deferens and the spermatic vessels. If the sac is small it should be completely dissected free from the cord. Occasionally a large sac will be encountered; in which case it should be dissected and divided beyond the internal ring. The subsequent

peritoneal defect should be closed with endoloopsuture, because the bowel can herniate into the preperitoneal space. Cord lipomas are usually found laterally along the spermatic vessels and should be reduced [11].

Mesh selection and fixation

Select a large (10 cm by 15 cm) piece of mesh usually polypropylene (prolen) based; insert it in the preperitoneal space via the Hasson port. Position the mesh so that the entire myopectineal orifice is covered with good superior, medial and lateral overlap. The mesh normally overlaps the cord structures in order to cover the indirect space completely. It is important that the peritoneum and sac are be reduced proximal to where the inferior border of the mesh will lie so that it cannot slip back under the mesh and lead to recurrence. Anchor the mesh with spiral tacks at three major places:

- A. Laterally and superiorly about 2 cm medial to the anterior superior iliac spine and above the inguinal ligament (so that the cutaneous nerve branches to the thigh are avoided).
- B. Midline and medial to the inferior epigastric vessels on the abdominal wall.
- C. Just above the pubic tubercle and into the cooper’s ligament along the superior border of the pubic ramus. The location of the femoral vessels should be clear.

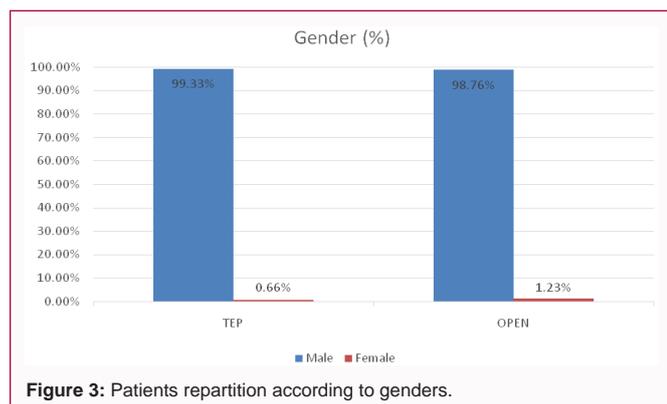


Figure 3: Patients repartition according to genders.

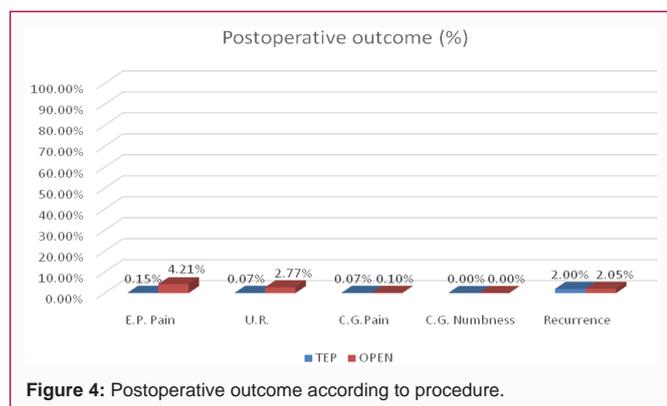


Figure 4: Postoperative outcome according to procedure.

Inspect the field for hemostasis and evacuate the space of dioxide of Carbone while keeping the inferior borders of the mesh flat. This maneuver reduces the chance that the leading peritoneal edge will slip back under the mesh during desufflation. Close the anterior rectus sheath at the umbilicus with absorbable suture and close the skin. Local anesthesia can be infiltrated at the port sites at the end of the procedure [11-13].

Discussion

For unilateral first-time inguinal hernias, either laparoscopic or open repair with mesh can offer excellent results (5, 10). The major dilemma of laparoscopic approach is that the technique requires a significant number of cases to get a very good skill. For surgeons working in team, it makes sense to have one surgeon in the group who performs laparoscopic repairs, so that experience can be concentrated [14,15]. For others, the best technique remains the approach that the surgeon is most comfortable and experienced performing [16-19]. There have been a number of well conducted, large scale prospective randomized comparisons of laparoscopic versus open inguinal hernia repair for unilateral hernias published in the last decade. In the largest American trial to date, the Veterans Affairs Cooperative Study randomized 1,983 patients to open or laparoscopic hernia repair. Two-year follow-up was completed with 85% of the patients. There were twofold more recurrence (10%, 1% vs. 4%, 9%), a slightly higher complications rate (39%, 0% vs. 33%, 4%), but reduced pain and earlier return to work in the laparoscopic group than in the open mesh group. Another large trial from Sweden reported on 1,512 patients with unilateral hernia randomized to laparoscopic Totally Extraperitoneal Patch repair (TEP) or open Lichtenstein repair with a 5-year follow-up. Again, a higher recurrence rate was found in the TEP group (3%, 5% vs. 1%, 2%). The patients of one of the laparoscopic surgeons in the trial were found to have an unusually

high risk of recurrence, but even after exclusion of that surgeon's patients from the analysis, the recurrence risk was still 2%, 4% in the TEP group [20-22].

Other well-conducted trials have reported different results, thus fueling the controversy. Wright at randomized 300 patients to TEP or open repair and reported similar recurrence rates (2%) in both arms, and similar rates of chronic pain. A Cochrane meta-analysis reviewed 41 trials of laparoscopic vs. open inguinal hernia repair involving 7,161 patients. The analysis found that operative times were longer for laparoscopic repair by 15 min, and there was a higher risk of rare serious complications. Return to usual activities was faster, and there was less persistent pain and numbness. There was no significant difference in hernia recurrence rates between laparoscopic and open mesh techniques [23-26].

In our prospective study, we found that the TEP procedure was performed 12 min faster than the conventional Lichtenstein procedure (46 min vs. 58 min), early postoperative pain was less in TEP patients (0%, 15% vs. 4%, 21%) justifying the quick return to work, postoperative urinary retention was noticed only in 0,07% TEP vs. 2%, 77%, there was no difference between the two groups regarding the occurrence of chronic groin pain and numbness, and the recurrence rate was similar in both groups (2%, 0% vs. 2%, 05%) (Figure 4) [27-30].

Conclusion

Based on our results, we think that in case of unilateral, first-time inguinal hernia, both surgical approaches (TEP/Lichtenstein) offer excellent results and the choice depends upon the surgeon skill as well as the patient preference or economical ability. Furthermore, it can be stated that the open procedure is the gold standard of any groin hernia since its learning curve is simple.

Ethical Consideration

We have received informed consent from each patient before being enrolled, as well as permission from the scientific board of our Clinic.

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