Research Article

A study of laparoscopic total extraperitoneal endoscopic hernioplasty in cases of inguinal hernia - an experience of a tertiary care centre

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ABSTRACT

Background: In present days, there is increase in laparoscopic hernia repair for inguinal hernias. The objective of this study was to evaluate the various parameters in laparoscopic TEP hernia repair.

Methods: Prospective study. 25 patients, diagnosed with inguinal hernia that underwent laparoscopic TEP hernia repair from July 2011 to November 2013. Intervention: laparoscopic TEP hernia repair.

Outcome measures: Conversion to open hernia repair. Operating time, unfavorable intra-operative inadvertent events, total hospital stay, return to routine work and recurrence.

Results: Laparoscopic hernia TEP repair has less post-operative pain, early recovery with minimal hospital stay, low rate of post-operative complications, better cosmesis and no short term recurrence.

Conclusions: The laparoscopic TEP hernia repair has better cosmesis, less post-operative pain, early recovery with minimal hospital stay, low rate of post-operative complications. However, for recurrence long term follow up is required.

Keywords: Inguinal hernia, Laparoscopic TEP hernia repair, Open hernia repair

INTRODUCTION

Hernia can be defined as an abnormal protrusion of a part or whole of viscus through a normal or abnormal opening in the wall of a cavity containing it. Inguinal hernia repair is the most commonly performed surgery over the world and requires having a sound knowledge of the anatomy and physiology of groin region.^{1,2}

The most of the inguinal hernia occurs through defect in the myopectineal orifice which can be repaired by open as well as laparoscopic route. Since the oldest day's surgeon started doing hernia repair many surgical technique and methods were tried throughout the world. With the advancement of laparoscopic skill and available technology laparoscopic hernia repair is gaining popularity. Laparoscopic TEP hernia repair is considered better than TAPP hernia repair.

METHODS

Hospital Setting

The study was conducted at the surgical unit of civil hospital, Ahmedabad, a publicly funded tertiary care institution.

Type of study: prospective study

Data collection

A total of 25 patients were selected for the study those who presented to the Department of Surgery, Civil Hospital, Ahmedabad. With inguinal hernia from July 2011 to March 2013 and match the inclusion criteria mentioned above.

The records was collected from the patients by asking detailed history, proper clinical examination was done, investigation were done, intraoperative and postoperative course was noted. Data collection included clinical features, laboratory investigations, duration of surgery, intraoperative or postoperative complications, and duration of hospital stay, analgesics, and antibiotics. There was a follow up of minimum 6 months except four patients where follow up was of 2 months.

Inclusion criteria

All unilateral/bilateral/recurrent reducible inguinal hernia which reached up to superficial inguinal ring (Bubonocele).

Exclusion criteria

- Irreducible hernia,
- Any complications of hernia,
- Any infra-umbilical previous surgery,
- Intra-abdominal infection,
- Intra-abdominal adhesions,
- Ischemia heart disease,
- COPD,
- Uncontrolled DM,

A 10-mm laparoscope, two atraumatic graspers are needed to perform the dissection, balloon dissector make the extra peritoneal dissection easier and simpler, 6-8 inch curved clamp is needed to dissect the fat and muscle at the umbilicus. A number 11 scalpel blade is used to incise the fascia, and two 'S' retractors facilitate the dissection and retraction of the fascia and muscle.

Two 5-mm trocars are used for the placement of the instruments that are used in the dissection of the preperitoneal space. Polypropylene mesh is the mainstay of the laparoscopic repair. Usually, a 15×15 cm mesh is used and trimmed to fit the posterior wall. The mesh is anchored to the abdominal wall with 5 mm tacks supplied in a multifire gun.

RESULTS

A total of 25 patients were selected for this prospective study those who presented to the Department of Surgery, Civil Hospital, Ahmedabad. With inguinal hernia from July 2011 to March 2013 and match the inclusion criteria mentioned above. After data collection, results were obtained as follows. In present study, two patients (8%) had complications; one patient developed seroma and one developed osteitis pubis and only in one (4%) patient laparoscopic TEP was converted into open preperitoneal hernioplasty because of peritoneal breach and even after suturing the peritoneal breach and introduction of verses needle into abdominal cavity there was local difficulties in dissection.

In present study mean hospital stay is 5.8 days, only 1 patient got discharged within 4 days, 11 patients got discharged after 5 days, 6 patients got discharged after 6 days, 6 patients got discharged after 7 days and one patient got discharged after 8 days. In present study 15 patients returned to routine work after 5 days, 6 patients returned to work after 6 days, 7 patients returned to work after 7 days, only 2 patients took more than 7 days returned to work. In present study there was no recurrence seen in all patients in the follow up of 6 months expect four patients where follow up was of 2 months. Laparoscopic hernia TEP repair has less post-operative pain, early recovery with minimal hospital stay, low rate of post-operative complications, better cosmesis and no short term recurrence.

Table 1: Complications rate.

Studies	Complication rate
Shaikh AG et al	7.1%
Choi YY et al	30.3%
Meyer et al	0.6%
Messaris et al	6.1%
Khoury et al	13%
Liem et al	8%
Present study	8%

Table 2: Conversion rate.

Studies	Conversion rate
Shaikh AG, et al	0.7%
Messaris et al	0
McCormack et al	2.7%
Elshof et al	1.1%
Liem et al	7%
Dulucq et al	1.2%
Present study	4%

Table 3: Post-operative stay.

Studies	Post-operative stay
Shaikh AG, et al	1-2
Dulucq et al	2
Choi YY et al	1.6+/-1.4
Khoury et al	1
Eklund et al	1
Present study	2.76

Table 4: Return to routine work.

Studies	Time to return to routine work
Sanna et al	14.8 days
Khoury et al	8 days
Lal, et al	12.8 ± 7.1 days.
Eklund et al	20 days
Present study	6+/-1 days

Hospital stay consisted of both pre-operative and post-operative period.

Table 5: Recurrence rate.

Studies	Recurrence rate
Shaikh AG et al	1.4%
Wright et al	2%
Pattar et al	2.4%
Neumayer et al	10.1
Messaris et al	0
Khoury et al	2.5%
Liem et al	3%
Aeberhard et al	1.6%
Tamme et al	0.6%
Dulucq et al	0.35%
Lal et al	0
Present study	0

DISCUSSION

Complication Rate (Table 1)

In present study out of 25 patients, two patients (8%) had complications one patient developed seroma and one developed osteitis pubis.

For osteitis pubis, Patient had past history of orthopedics intervention done on left hip joint 10 years after road traffic accident. He was treated with analgesics, physiotherapy, muscle relaxant and local steroid on and around pubic tubercle. He was relieved with this treatment but it took bit longer time. He could resume his normal duties within 45 days.

Patient developed seroma after 5 days of operation and was treated conservatively with regular follow up. Patient showed complete resolution of seroma after one month.

In a study done by Shaikh AG et al, there was 7.1% of patients had minor complications out of which one (0.7%) had acute urinary retention one (0.7%) presented with lateral cutaneous nerve paraesthesia 8 (5.7%) developed seroma and most of them resolved on conservative measure and needle aspiration as an out-patient procedure once and only in one patient multiple aspirations of 2-3 times were performed. In study done by Choi YY et al, 30.3% of patients had complications, operative site hematoma was detected in 16.8% (20 patients), but subsided spontaneously without any intervention or medication; scrotal swelling in 5.9% (7 patients) and seroma in 7.6% (9 patients) and aspiration was done; after that there was no recurrence of seroma. In study conducted by Meyer et al, which included 4565 patients, 0.6% had severe complication, 0.25% had bleeding, 0.04% had bladder injury, 0.11% had intestinal obstruction, 0.09% had intestinal perforation, 0.02% had injury to iliac vein, 0.02% had femoral nerve, 0.04% had lesion of vas deferens, 0.02% of patients died. In a study

conducted by Messaris et al, there was 6.1% of patients developed seroma identified at 2 weeks, but only 7 (1.9%) remained at 1 month, and none at 1 year. In a study conducted by Khoury et al, minor complication occurred in 13%. In study conducted by Liem et al, 15 patients (3%) the epigastric vessels were ligated because they blocked the view of the surgeon; in 2 patients, these vessels were ligated after being injured during the insertion of a trocar; 64 patients had a pneumoscrotum (13%), which disappeared within one day in all but 3 patients.³⁻⁸

In most of studies mentioned above, seroma is one of the most common minor complications.

Conversion Rate (Table 2)

In present study out of 25 patients, only one (4%) patient laparoscopic TEP was converted into open preperitoneal hernioplasty because of peritoneal breach and even after suturing the peritoneal breach and introduction of Veress needle into abdominal cavity there was local difficulties in dissection.

In a study done by Shaikh AG et al, there was 0.7% (one patient) conversion rate because of adhesion and bleeding and converted into open surgery. In a study done by Hung LAU et al, conversion rate was 1.5% to trans abdominal preperitoneal and 0.5% to open repair. In a study conducted by Messaris et al, there was no conversion out of 274 patients. In a study conducted by Khoury et al, there was conversion rate of 1.3% because of peritoneal tear.^{3,6,7,9} In study conducted by McCormack et al, conversion rate was 2.7%. In study conducted by Elshof et al, conversion rate was 1.1% (5 patients) to open Lichtenstein tension free hernia repair it was due to peritoneal tear and adhesion.

In a study conducted by Aeberhard et al, conversion rate was 1.8% to trans abdominal preperitoneal and 1.6% to open surgery. In study by Liem et al, 115 patients (24%) had peritoneal tears, but in only 8 of these patients (7%) did the tear result in loss of pneumopreperitoneum, requiring a switch to another technique. In study conducted by Dulucq et al, conversion rate was 1.2% (36 patients), 12 were converted to open Lichtenstein tension free hernia repair and remaining into laparoscopic TAPP.^{8,10-13}

In the studies mentioned above conversion rate varies from 0.5% to 7% which is comparable to present study.

Hospital stay and Post-operative Stay (Table 3)

Hospital stay consisted of both pre-operative and post-operative period.

In present study mean hospital stay is 5.8 days, only 1 patient got discharged within 4 days, 11 patients got discharged after 5 days, 6 patients got discharged after 6

days, 6 patients got discharged after 7 days and one patient got discharged after 8 days. In study done by Choi YY et al, mean hospital stay was 1.6 days. In a study done by Hung LAU et al, mean hospital stay was 1.9 ± 1.4 days.^{4,9} The mean hospital stay of present study is greater than compared studies.

The mean post-operative duration for which patients stayed was 2.76 day. 13 patients stayed for 2 post-operative days, 6 patients stayed for 3 post-operative days, 5 patients stayed for 4 post-operative days, only one stayed for 5 post-operative days. We discharged most of patients on 2nd post-operative day as per protocol. In a study done by Shaikh AG et al, 74% (104 patients) of patients were discharged on first postoperative day and 26% (37 patients) stayed more than one day. In present study 52% of patients stayed for 2 post-operative days, 24% of patients stayed for 3 post-operative days, 20% of patient stayed for 4 post-operative days and 4% of patient stayed for 5 post-operative days. In a study conducted by Khoury et al, 98% of patients out of 150 patients discharged on same post-operative day. In study conducted by Eklund et al, 91% of patients out of 665 patients were discharged on same post-operative day.^{3,7,14}

In the studies mentioned above majority of patients were discharged on same post-operative. So this will reduce the burden on hospital with regards to sickbeds which is important in country like India. However, hospital stay was not decided by only patients' physical condition but surgeon's preference, secondary gain such as the hospital's turnover rate of sickbed, psychological effect, and traditional beliefs.

Though the post-operative stay in present study was more, most of the patients were fit to be discharged on the 2nd postoperative day. But the lack of adequate hospital facility near the patient's residential area and also poor infrastructure, coupled with the fact that our hospital caters to large area, because of all these factors most patients opted to stay in the hospital for a longer duration; this has prompted us not to hasten the patient's discharge.

Return to Routine work (Table 4)

It is time taken for patient to return to routine work post operatively. In present study 15 patients returned to routine work after 5 days, 6 patients returned to work after 6 days, 7 patients returned to work after 7 days, only 2 patients took more than 7 days returned to work.

In a study done by Hung LAU et al, 69% (113 patients) of patients returned to work within a week. In study conducted by Sanna et al, mean duration of returning to work was 14.8 days in recurrent hernia. In present study 92% of patients returned to work within a week. In a study conducted by Khoury et al, median duration was 8 days for patients to return to work. In study a conducted by Lal et al, mean duration at which patient returned to

work was 12.8 ± 7.1 days. In study conducted by Eklund et al, mean duration at which patient returned to routine work was 20 days.^{7,9,14-16}

In present study mean duration at which patient returned to work is comparable to above mentioned studies. The patients who undergo laparoscopic surgery are able to resume routine early when compare open surgery. This is particularly important as patients in our hospital are generally come from poor socio-economic group.

Reccurence Rate (Table 5)

In present study there was no recurrence seen in all patients in the follow up of 6 months expect four patients where follow up was of 2 months.

In a study done by Shaikh AG et al, recurrences occurred in 1.4% (2) of patient, one occurred in recurrent hernia and one in bilateral hernia and one was due to mesh migration and other due to infection; both were managed with conventional Lichtenstein tension free hernia repair. In a study done by Wright et al, recurrences occurred in 2% (3 patients) of patients and all patients with large direct inguinal defect, with recurrence appearing above the superior border of mesh in follow up of 5 years. In a study done by Pattar et al, recurrence rate was 2.4% (5 patients) out of which 2 was re-recurrence. Three of the recurrences were noted after three months, one at six months and the other eight months after the operation. All the recurrences were electively repaired by open tension-free hernioplasty. In study conducted by Neumayer et al, recurrence rate was 10.1% (79 patients) in primary hernia and 10% (8 patients) in recurrent hernia.^{3,17-19}

In a study conducted by Messaris et al, there was no recurrence of hernia in one year follow up. In a study conducted by Khoury et al, with five year follow up the overall recurrence rate was 2.5%. In study conducted by Liem et al, recurrence rate was 3% (17 patients) out of which 14 occurred within one year of surgery. In a study conducted by Aeberhard et al, recurrence rate was 1.6% at the end of 1 year. In study conducted by Tamme et al, recurrence rate was 0.6% over period of 7.5 years. In study conducted by Dulucq et al, the incidence of recurrence was 0.35% in 3100 patients over 15 years. In a study conducted by Lal et al, there was no recurrence after 13 months of follow up.^{6-8,12,13,19}

In the studies mention above the recurrence rate varies from 0 to 10.1%.

CONCLUSION

In the present era of advanced medical care, improved patient outcomes measured in terms of less post-operative pain, early recovery and return to work, cosmesis along with safety of surgery take centre stage in patient care laparoscopic hernia repair goes a long way in addressing most of these concerns.

It has less post-operative pain, early recovery with minimal hospital stay, low rate of post-operative complications, better cosmesis and no short term recurrence(as seen in our study). However longer follow up is needed to evaluate the long term recurrence rate in the laparoscopic TEP repair.

Laparoscopic TEP is a technique combining the advantages of minimal access surgery and mesh reinforcement of the myopectineal orifice of Fruchaud.

Though operative time and conversion rate was relatively higher in our setup compared to global standards, it is set to show a correcting trend with increasing surgeons' experience.

Laparoscopic approach to bilateral or recurrent inguinal hernias is superior to that of the conventional open approach. Bilateral inguinal hernias has the advantage of using same number of incisions and trocars as a unilateral inguinal hernia, in contrast to the open anterior approach, which requires two separate groin incisions.

In regard to the treatment of recurrent hernias, the posterior approach afforded by laparoscopic surgery allows the surgeon to circumvent the previously scarred tissue resulting from the initial open approach. In effect, the surgeon is able to operate in virgin tissue planes, thereby greatly lessening the arduousness of the procedure.

Currently, TEP seems to be a better alternative than the existing open repair, provided the long-term recurrence rates are comparable. Despite the fact that TEP was a new procedure for the surgeon and the study was conducted during the learning phase, the results are comparable with those in the world literature.

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Ethical approval: Not required

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