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Dr. Talreja Manoj
Associate Professor, Department of
General Surgery, Dr. M K Shah
Medical College & Research Centre,
Chandkheda, Ahmedabad,
Gujarat, India

Dr. Makwana Viral
Associate Professor, Department of
General Surgery, Dr. M K Shah
Medical College & Research Centre,
Chandkheda, Ahmedabad,
Gujarat, India

Dr. Mansuri Mohammed Anis
Assistant Professor, Department of
General Surgery, Dr. M K Shah
Medical College & Research Centre,
Chandkheda, Ahmedabad,
Gujarat, India

An analysis of laparoscopic inguinal hernia repair by various methods in a teaching institute

Dr. Talreja Manoj, Dr. Makwana Viral and Dr. Mansuri Mohammed Anis

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Abstract

Background / Aim: Laparoscopic repair of inguinal hernia has come a long way now since its popularity and more and more young surgeons are also learning this procedure at an early age so that they can master it and fulfill the wishes of people requesting for minimal access surgery. This study aims to study various methods of inguinal hernia repair over a span of 3 years in a teaching hospital.

Methods: All the patients operated electively for uncomplicated inguinal hernia from June 2019 to June 2021 were selected for the study. They were operated by various laparoscopic methods and followed till June 2022.

Results: There were total 100 cases of inguinal hernia repair during study period. 51 cases were operated by TEP, 27 by TAPP and 22 by eTEP method.

Conclusion: TEP, TAPP and eTEP methods have similar efficacy. It is found that TEP, TAPP and eTEP all methods are safe and can be done after a learning curve.

Keywords: Laparoscopy, inguinal hernia, meshplasty

Introduction

Prevalence of Inguinal Hernia is approximately 1.5% for all age groups which reaches up to 4% after 40 yrs of age. It is much more common in men than women. Since laparoscopic inguinal hernia repair was first reported by Ger and colleagues in 1990^[1], the operation has been refined into an attractive alternative to open hernia repair for many patients and surgeons. After the initial attempts by Ger in 1982 first transabdominal preperitoneal (TAPP) patch application was performed by Leroy in 1990 and soon totally extraperitoneal intervention was done by Dulucq in 1991 and Mckernan in 1992^[1]. Jorge Daes in 2012 first introduced the extended or enhanced view totally extraperitoneal repair (eTEP) to address difficult inguinal hernias^[2]. The principle is to create a larger space than what is done in TEP to tackle large groin hernias.

Laparoscopic inguinal hernia repair is also becoming popular due to patient demand of minimal access surgery and motivation of young surgeons to learn and master the procedure at an early age in the prevailing atmosphere. Inguinal hernias patients are mainly symptomatic, necessitating surgery; but even those who are asymptomatic have a 70% risk of needing surgery within a period of 5 years following watchful waiting^[3].

The aim of this study was to compare the effectiveness and safety of various methods of laparoscopic inguinal hernia repair like TEP, TAPP and eTEP at our institute, Dr M K Shah Medical College and research centre, Chandkheda, Ahmedabad.

The following parameters were evaluated for all different methods of laparoscopic inguinal hernia repair.

- Operative technique
- Intraoperative difficulties and complications
- Operating time
- Total morbidity
- Postoperative pain & complications
- Inguinal paresthesia
- Time to return to work
- Recurrence
- Overall patient satisfaction

Corresponding Author:
Dr. Talreja Manoj
Associate Professor, Department of
General Surgery, Dr. M K Shah
Medical College & Research Centre,
Chandkheda, Ahmedabad,
Gujarat, India

Materials and Methods

Total 100 patients operated during the time period of June 2019 to June 2021 were taken in to the study and they were followed till June 2022. Only selective uncomplicated patients after implementing exclusion criteria were taken into the study and their all details were noted on a standard form prepared by our team. All patients were well planned for their surgery after doing all required investigations, references and preoperative anaesthetic fitness.

They were operated as per indication by various methods.

Out of all 51 cases were operated by TEP, 27 by TAPP and 22 by eTEP method.

Anaesthetic consideration

All cases required general anaesthesia.

Method of patient selection

TEP and eTEP repair was standard for us in all unilateral or bilateral inguinal hernias. Patients with complications like giant, irreducible or recurrent inguinal hernia were operated by TAPP method. This institute does not charge anything extra for laparoscopic surgeries and most of the patients were covered in various government schemes like MAA or Ayushman Bharat Yojana, so all type of socioeconomic groups were available and were openly opting for laparoscopic types of surgeries.

Exclusion Criteria's

- A. Massive hernias
- B. Unfit in Anesthesia
- C. Obesity with BMI >30
- D. Significant chest disease
- E. Patient on anticoagulants
- F. Patients with collagen or connective tissue disorders for eg. Marfan syndrome
- G. Previous history of laparotomy
- H. Patients with intestinal obstruction or strangulation

Operating time

All surgeries were performed by the team led by corresponding author. Operative time for each procedure was obtained from the records and average was obtained.

Intraoperative Complications

- Vascular injury
- Bladder injury
- Bowel injury

Postoperative complications

Complications in postoperative period were noted as well as long term sequelae in the form of chronic pain and recurrences if any were also recorded.

1. Seroma/ hematoma formation
2. Wound infection
3. Postoperative pain (7 days or more)
4. Testicular atrophy
5. Mesh infection
6. Chronic pain (more than 6 months)
7. Sinus formation
8. Recurrence

Results

All patients were male with age ranging from 25 to 78 years with a median of 48.8 years.

All laparoscopic procedure required general anaesthesia.

Table 1: Type of laparoscopic procedure carried out

Type of procedure	Number of patients
TEP	51/100 (51%)
eTEP	27/100 (27%)
TAPP	22/100 (22%)

Out of 100 patients, 89 had unilateral inguinal hernia while 11 had bilateral inguinal hernia. Of these 100 patients 51 were operated by TEP, 27 eTEP and 22 by TAPP.

Table 2: Average time taken for procedure

Procedure	Time taken in minutes
TEP	62 minutes
eTEP	70 minutes
TAPP	75 minutes

The average time taken for TEP was slightly less than other methods as slightly more operative work was required in other methods.

Table 3: Early complications in different procedures

Complications	TEP (51)	eTEP (27)	TAPP (22)
Seroma/Hematoma	3(3)	2	0
Wound infection	2	1	1
Post operative pain (7days or more)	5	4	4
Testicular atrophy	0	0	0
Mesh infection	0	0	0

On comparison of early complication post operative pain was most common (9.8%) in TEP group. Similarly hematoma formation (5.88%) was most common with same technique.

Table 4: Late complications in different procedures

Late complications	TEP (51)	eTEP (27)	TAPP (22)
Chronic pain (6 months or more)	1	1	2
Recurrence	0	0	0
Sinus formation	0	0	0

Chronic pain was present as late complication in around 9.08% of patients with TAPP method. In other techniques chronic pain and other late complication were rare.

All the patients were observed postoperatively. Average length of stay in case of each procedure was recorded. In TAPP method it was 4.2 days, eTEP method 3.6 days and in TEP 3.8 days.

Discussion

In our study we included 100 cases of uncomplicated inguinal hernia that presented in our surgical department over the period of two years. All of them were male with median of 48.6 years. Age is a factor for incidence and type of inguinal hernia; incidence increases by age.

Inguinal hernia repair is one of the most commonly performed surgery today. All the patients had uncomplicated inguinal hernia. 89 patients had unilateral while 11 had bilateral inguinal hernia.

There are three laparoscopic repair for inguinal hernias which popular these days and have been described till date [4].

In laparoscopic repair mesh placement is in preperitoneal plane. The approach may be TAPP (transabdominal preperitoneal) or TEP (totally extraperitoneal). It is associated with longer learning curve and is costlier than open repair.

Patient selection is very important. This needs to take into account patient's fitness for anaesthesia, affordability, history of any previous surgery and existing comorbidities of the patient.

Patients with respiratory and/ cardiovascular diseases are not good candidates for general anaesthesia. Also those patients who had been operated for lower abdominal surgery couldn't be subjected to preperitoneal repair or TEP. Laparoscopic procedure increases cost by use of general anaesthesia and placement of tackers for fixation of mesh ^[6].

We at our centre practice all three types of laparoscopic repairs as mentioned above.

We offer eTEP and TAPP laparoscopic procedure to those patients who are difficult, recurrent, bilateral inguinal hernias.

In all types of laparoscopic hernia repairs general anaesthesia is required with a longer operative time and more risk of serious complications.

In our study the mean operation time for TEP (62 minutes) was slightly shorter than eTEP (70 minutes) and TAPP method (75 minutes). We consider here that all operating surgeons have undergone a sufficient learning curve for the procedures.

No hematoma/seroma formation were observed in the TAPP group in comparison with the eTEP and TEP where also such findings were very low.

Average length of stay in case of each procedure was recorded. In TAPP method it was 4.2 days, eTEP method 3.6 days and in TEP 3.8 days

Average length of stay was 3.6 days for eTEP, 3.8 days for TEP and 4, 2 days for TAPP. The reduction in hospital stay is likely to lead to savings in both direct hospital costs and societal costs.

The eTEP technique took slightly longer to perform. However it results in very low postoperative pain, fewer wound infection, and quick return to daily activity and working than patients with Lichtenstein method or Preperitoneal method as observed in study conducted by Karthikesalingam A in 2010 ^[4].

Chronic pain has been reported to occur in two patients each in TEP and Preperitoneal method.

There was no case of delayed mesh infection or sinus formation.

We did not encounter any recurrence in TEP, eTEP and TAPP methods.

On the basis of these experiences, laparoscopic TEP method seems to be as good with extraperitoneal mesh placement, however where a large defect is present one can opt for eTEP method and TAPP method can be used for difficult, bilateral or recurrent inguinal hernias. Also, the choice of the best treatment option should depend on the surgeon's expertise and each patient ^[5].

All laparoscopic procedures have its own limitations in terms of requirement of general anaesthesia, cost of tackers and larger mesh and learning curve ^[6].

Various laparoscopic hernia repair techniques have been compared in a number of studies ^[1-5]. All laparoscopic repairs are more expensive and require more expertise and skilled hands after a long learning curve. While TAPP method is easier and safer to learn due to direct vision and no need to create an operating space as we do in TEP or eTEP methods, eTEP may be a better option as it provides an enhanced view of operating area while still remaining extraperitoneal.

Published literature support that laparoscopic hernia repair is best suited for recurrent and bilateral inguinal hernia although it may be offered for primary inguinal hernia if expertise is available ^[6].

The laparoscopic approach is now recommended by NICE as the preferred technique for repair of bilateral and recurrent inguinal hernia and an accepted option for unilateral hernia ^[7].

At present, the laparoscopic repair of hernias finds its role in patients with bilateral or recurrent hernias or in patients with unilateral hernia who desire a minimal period of postoperative disability.

Conclusion

All types of laparoscopic inguinal hernia repair are safe and provide less post-operative morbidity and definitely have many advantages over open repair. For difficult, bilateral and recurrent inguinal hernias eTEP and TAPP methods of laparoscopic repairs can be used with much ease though with slightly more time.

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