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Evaluation of Laparoscopic Totally Extraperitoneal Mesh Hernioplasty: A Study

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Abstract: ***The laparoscopic hernia repair has evolved as a technique involving placement of synthetic mesh in pre-peritoneal space. The present study was done to evaluate the totally extraperitoneal mesh hernioplasty for repair of inguinal hernia in our institute. The mean operative time was 47min. Peritoneal tear (14%) was the most common complication occurring intra-operatively followed by seroma formation (12%). We found that laparoscopic TEP repair is a safe and effective technique for inguinal hernia.***

Keywords: Inguinal hernia, Laparoscopic hernia repair, TEP, Totally Extra Peritoneal, Meshplasty

1. Introduction

Hernias are among the oldest known afflictions of human kind and surgical repair of inguinal hernia is the most common general surgery procedure performed today [1]. There are wide varieties of methods of hernia repair throughout the history. Tension free mesh hernioplasty has been described as gold standard. In addition to recurrence, painful postoperative neuromas, spermatic cord injuries and postoperative epididymitis or orchitis are occasionally seen with the classic extraperitoneal herniorraphy using the groin approach. Finally the conventional operation is painful and is associated with a significant loss of hours on the job, especially when the patient's occupation involves heavy weight lifting. With advent and popularity of minimal access surgery (MAS) amongst surgeons and general population, laparoscopic hernia repair has been established as mainstay of treatment and procedure of choice in bilateral inguinal hernia, recurrent hernia and unilateral hernia in young persons. The approach in laparoscopic inguinal hernia repair can be Trans-Abdominal Pre-peritoneal (TAPP) or Total Extra-Peritoneal repair (TEP). The present proposed study was planned to evaluate the TEP mesh hernioplasty for repair of inguinal hernia.

2. Material and methods

This prospective study was carried out on 50 patients of unilateral inguinal hernia, aged more than 18years, admitted with inguinal hernia from April 2016 to December 2017 in our institute. The patients with complicated inguinal hernias (obstructed, irreducible or strangulated hernias), BMI >30, previous lower abdominal surgery, suspected malignancy, immune-compromised and patients who refused to give consent were excluded from the study.

TEP repair was performed under general anaesthesia. First 10mm port was placed in pre-peritoneal space at the level of umbilicus. Insuffulation pressure was maintained at 12mmHg. One 5 mm working port was inserted one at 2 cm above pubic symphysis and the other 5mm port midway between two ports. In case where the sac was small, entire sac was dissected out of the internal ring depending on the feasibility. In complete hernia, the sac was carefully separated from cord structures and was divided. Proximal part was ligated and distal sac was left open. Adequate space was created for a 15X12 cm polypropylene mesh to be spread in the area. Gradual desufflation was done under vision to see any rolling of mesh which is prevented by fixing the mesh with one grasper. Infra-umbilical rectus sheath was closed with Vicryl no 1. All port sites were closed and sterile dressing done.

Inj cefoperazone + sulbactam 2 gm i/v was given at the time of induction of anesthesia. Diclofenac suppository 50 mg BD was given routinely to all patients during post-operative period and further analgesics was given as per requirement. The patients were discharged after 48hrs. Follow up was done at 15th day, 1 month, 6 months and 1 year. The presence or absence of seroma, hematoma, wound infection and recurrence were recorded. Data were recorded and subjected to statistical analysis.

3. Results

The present study was conducted in our institute over a period of 1.5 years in patients with inguinal hernia who underwent Totally Extra-peritoneal Mesh Repair (TEP). In our study, most of the patients were in age group of 21-40

years comprising 54% of the total patients. All the patients were males. Majority of patients (68%) were having right sided hernia. Indirect type was more common comprising 62% of all the cases.

In 74% of patients, the operating time was ≤50 minutes (calculated as time taken from the time of first skin incision to last port site closure) and it was >50 minutes in rest of the patients. The mean operative time was 47min with range from 32min to 75min. There was no conversion to open in our study.

The complications observed has been shown in table:1

Table 1: Complications observed in the study

Complications		Frequency
Intra-operative	Peritoneal tear	7 (14%)
	Iliac vein injury	0 (0%)
	Bladder injury	0 (0%)
	Bowel injury	0 (0%)
	Damage to iliac vessels	0 (0%)
Post-operative	Scrotal hematoma	2 (4%)
	Intestinal obstruction	0 (0%)
	Seroma formation	6 (12%)
	Orchitis	0 (0%)
	Recurrence	1 (2%)

Average duration of stay in hospital was 3.32 days with range from 2days – 5days.

4. Discussion

Inguinal hernia repair contributes significantly to a general surgeon's work load. Since the evolution of laparoscopic inguinal hernia repairs, the totally extra-peritoneal repair (TEP) has evolved as a technique involving placement of synthetic mesh in pre-peritoneal space. The history of surgery demonstrates that the procedures which are less traumatic, even if more complex tend to supersede those which involve more trauma and pain. The present study was done to evaluate the totally extraperitoneal mesh hernioplasty for repair of inguinal hernia in our institute.

The mean operative time for TEP repair in our study was 47 minutes. Mean operative time in various other studies in TEP repair ranges from 41min – 96min [2-5]. In earlier studies, mean operative time in TEP repair was more as compared to open repair but in recent times with surgeons gaining experience the mean operative time is comparable to that of open inguinal hernia repair.

Peritoneal tear (14%) was the most common complication occurring intra-operatively. In all these cases tear was small and was left as such after decompressing the pneumoperitoneum with veress needle. In a study conducted by Scheurelain et al, all the peritoneal leaks were controlled by continuous suture, and in no case conversion was required [4]. In another study by Flamming et al peritoneal tear was the most common reason of conversion to open [2]. The incidence of iliac vein injury, bladder and bowl injury has been observed as 0.02%, 0.04%, and 0.09%, respectively in literature [6]. In our study, we didn't encounter any of these complications. The conversion from TEP to open surgery has been reported in 0-7% of patients [7]. The reasons for conversions were inability to open the mesh and abnormal anatomy. There was no conversion in our study.

The incidence of scrotal hematoma following TEP has been reported as 17.8% [8,9]. Clinical factors associated with scrotal hematoma formation are large hernia defect, an extension of hernia into the scrotum and the presence of the distal indirect sac in a study conducted by Lau et al [10]. We observed scrotal hematoma in 4% of patients which was managed using scrotal support.

Seroma has been a concern to patients because it mimics a post operative recurrence of inguinal hernia. The incidence ranges between 1.9 to 11% [9,11]. Lau et al found that seroma formation is associated with old age, large hernia defects and presence of distal indirect sac [10]. The incidence of seroma in our study was 12%. Out of six patients who had seroma formation, only one patient required aspiration and the seroma resolved without any intervention in other patients.

The reported incidence of recurrence after TEP has been around 1–2% [12]. In our study, one patient (2%) got recurrence and was managed by open anterior approach. Fitzgibbons et al 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 [13].

The incidence of orchitis and intestinal obstruction has been observed as 0.08%, and 0.11%, respectively in literature [14,6]. In our study, we didn't encounter any of these complications. The predominant factors in successful preperitoneal hernia repair are adequate dissection, satisfactory delineation of anatomy with complete exposure and coverage of the entire myopectineal orifice.

5. Conclusion

We concluded that laparoscopic TEP repair is a safe and effective technique for inguinal hernia which enables a faster convalescence and return to productive activity. However, the learning curve of the procedure is long but the operating time reduces with experience.

6. Limitations

This study was unicentral with small study group. All consultant surgeons involved in this study were expert in minimally invasive surgeries as well, so they did not face much difficulty in doing these procedures.

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