

## ORIGINAL ARTICLE

# A COMPARATIVE STUDY BETWEEN TOTAL EXTRA-PERITONEAL (TEP) REPAIR AND TRANS ABDOMINAL PRE-PERITONEAL (TAPP) REPAIR IN MANAGEMENT OF INGUINAL HERNIA

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## ABSTRACT

**Background:** Groin hernias are the most common conditions referred to surgeons all over the world and over five lakh hernia repairs are performed annually. Our purpose in this study is to compare the results of laparoscopic hernioplasty by Total Extra-Peritoneal (TEP) technique and laparoscopic Trans Abdominal Pre-Peritoneal (TAPP) technique.

**Methodology:** This was the prospective study conducted on cases of inguinal hernia in which half cases were operated by Laparoscopic Trans Abdominal Pre-Peritoneal (TAPP) mesh repair while other half were treated by Total Extra-Peritoneal (TEP) mesh repair of inguinal hernia in New Civil Hospital, Surat. All the patients were admitted and a detailed history and clinical examination were carried out as per written proforma.

**Results:** This comparative study consisted of 60 patients. The most common diagnosis was right indirect inguinal hernia followed by left direct inguinal hernia in the both the groups. Overall the TEP was far better procedure compared to TAPP. The indicators like mean operative, Post-op pain, post-op hospital stay (in days) and return to normal work (in days) were far better than TAPP.

**Conclusion:** Our study supports the view that laparoscopic TEP and TAPP mesh repair of inguinal hernia is safe and efficacious, but long term Randomized Control Trials with enhanced sample size and reduced confounding factors are still required to establish the absolute superiority of TEP over TAPP.

**Keywords:** Total Extra-Peritoneal (TEP) repair, Trans Abdominal Pre-Peritoneal (TAPP) repair, Inguinal hernia

## INTRODUCTION

No disease of human body, belonging to the province of the surgeon, requires in its treatment a better combination of accurate, anatomical knowledge with surgical skill than hernia in all its varieties.<sup>1</sup> Groin hernias are the most common conditions referred to surgeons all over the world and over five lakh hernia repairs are performed annually.<sup>2</sup> The lifetime risk for men is 27% and for women is 3%.<sup>3</sup>

The laparoscopic Trans Abdominal Pre-Peritoneal (TAPP) repair was a revolutionary concept in the hernia surgery and was introduced by Arregui<sup>4</sup> and Dion<sup>5</sup> in the early 1990s. Laparoscopic groin her-

nia repair can be done by TAPP approach and also by Total Extra Peritoneal (TEP) approach.<sup>6</sup>

Better understanding of the laparoscopic anatomy and technological advances including that of optics did not drastically reduce the complication rate and the recurrence rate, hence leading to dissatisfaction not only among patients, but also among the laparoscopic surgeons.

The learning curve of laparoscopic repair of inguinal hernia has been made all the more steep because of lack of documentation of results with regard to patient satisfaction, post-op pain, duration of stay in hospital, complications and recurrence of hernia, hence making stratification of patients for either TEP or TAPP repair difficult.

Our purpose in this study is to compare the results of laparoscopic hernioplasty by Total Extra-Peritoneal (TEP) technique and laparoscopic Trans Abdominal Pre-Peritoneal (TAPP) technique, and determine if the relative advantages achieved could be put in practice in large scale and also identify criteria which may help stratify the patient to a particular type of repair to obtain encouraging results for that particular patient.

**MATERIALS AND METHODS**

This was a prospective study. This study consisted of 60 patients of inguinal hernia treated with laparoscopic hernia repair, 30 of whom were treated by Laparoscopic Trans Abdominal Pre-Peritoneal (TAPP) mesh repair and the remaining 30 cases treated by Total Extra-Peritoneal (TEP) mesh repair of inguinal hernia in New Civil Hospital, Surat from May 2012 to July 2014 which included a minimum of six months of follow-up.

The cases who are included in the study are aged 18 years and above giving written valid consent, diagnosed as having unilateral or bilateral inguinal hernia. Patients with complicated inguinal hernia and who require emergency exploration for complications of hernia like bowel obstruction, strangulation, gangrene and with failed laparoscopic repair of inguinal hernia are excluded from the study.

All the patients were admitted and a detailed history and clinical examination were carried out as per written proforma. Preoperatively the patients were offered options of either laparoscopic TEP or laparoscopic TAPP repair for inguinal hernia, and will be educated about the advantages, disadvantages, type of anaesthesia, and also the approximate cost of each of the procedure. After taking consent for the procedure, the patient is investigated thoroughly. Once the patient is deemed fit for surgery, consent is taken for the same.

Prophylactic oral antibiotics are given for duration of 5 to 7 days, of which parenteral antibiotics are given for at first 24 hours. Analgesics were given at 12 hour interval for a period of 3 to 5 days, shifted on to oral tablets as early as possible. Patients were observed for any complications like subcutaneous emphysema, mediastinitis, CO<sub>2</sub> narcosis in the immediate post-operative period and hematoma, seroma, wound sepsis during their stay in hospital and also assessed for postoperative pain and its severity. Patients were discharged once free of complications and once they resumed their activi-

ties of daily normal life. Patients were discharged within the next day or within 48 hours. At discharge they were advised to come for stitch removal after 7-8 days (1st follow up), and then after 1 week (2nd follow up), and then after 1 month of surgery, (3rd follow up). Later on after 3 months of surgery (4th follow up) and after 6 months after surgery (5th follow up).

**RESULTS**

This comparative study consisted of 60 patients with diagnosis of inguinal hernia who were admitted to the surgical inpatient ward in Government Medical College, New Civil Hospital, Surat.

The mean age of the cases in the TEP group was 35.77 ±13.47 years while it was 41.70± 14.71 years in the TAPP group. Age of the cases in both the groups was not statistically significant.

The most common diagnosis was right indirect inguinal hernia followed by left direct inguinal hernia in the both the groups (table 2).

Among the complications, surgical emphysema regressed by 3rd post-operative day, without surgical intervention (table 3).

**Table 1: Age Distribution of Patients Studied**

Age (years)	TEP	TAPP
< 20	1 (3.3)	1 (3.3)
21-30	14 (46.7)	7 (23.3)
31-40	5 (16.7)	7 (23.3)
41-50	8 (26.7)	8 (26.7)
51-60	2 (6.7)	7 (23.3)
Total	30 (100.0)	30 (100.0)

**Table 2: Diagnosis of cases**

Diagnosis	TEP	TAPP
Left Direct Inguinal Hernia	6 (20.0)	9 (30.0)
Left Indirect Inguinal Hernia	4 (13.3)	3 (10.0)
R/L Direct/Indirect Inguinal Hernia	1 (3.3)	1 (3.3)
R/L Indirect/Direct Inguinal Hernia	1 (3.3)	1 (3.3)
R/L Indirect Inguinal Hernia	2 (6.7)	2 (6.7)
Right Direct Inguinal Hernia	6 (20.0)	3 (10.0)
Right Indirect Inguinal Hernia	10 (33.3)	11 (36.7)

**Table 3: Complications observed in the cases**

Complication	TEP	TAPP
Surgical emphysema	2	1
Port site infection	1	2
Right shoulder pain	-	1
Early transient groin pain	1	2
Haematoma	2	-
Seroma	2	-

Post op pain is statistically similar between two groups of patients on day 2, (p=0.1964) and on DOD (p=0.7540) both are non significant.

**Table 4: Post Operative Pain among the two groups**

Grades	TEP (n=30)			TAPP (n=30)		
	Day 1	Day 2	DOD	Day 1	Day 2	DOD
No pain	0	0	10	0	0	7
Mild Pain	12	20	20	12	24	23
Moderate Pain	16	10	0	18	6	0
Severe Pain	2	0	0	1	0	0

**Table 5: Comparison between TEP and TAPP**

Criteria	TEP	TAPP	P value
Operative time (min)	70.8±22.3	88.0±13.8	<0.001*
Post-op pain (higher)	6.7	3.3	>0.05
Complications	26.7%	20%	>0.05
Post-op hospital stay (days)	2.27±0.69	2.53±1.17	>0.05
Return to normal work	6.43±2.76	7.2±2.31	>0.05

P value <0.05 is significant; \*TEP is significantly better

Overall the TEP was far better procedure compared to TAPP. The indicators like mean operative, Post-op pain, post-op hospital stay (in days) and return to normal work (in days) were far better than TAPP.

**DISCUSSION**

The duration of TAPP procedure was more than that TEP procedure owing to the peritoneal incision required to enter the pre-peritoneal space so as to place the mesh in pre-peritoneal space and then to suture the peritoneum (Reperitonealisation). The Yassar Hamaza et al.<sup>7</sup> required 96.1 minutes while BJ Leibl et al<sup>8</sup> needed 56 min, Lee L Swanstorm<sup>9</sup>, et al needed 57 minutes of operative time. The post operative pain in the study conducted by Yassar Hamaza, et al<sup>7</sup> is comparable with our study. The proportion of complications in the present study was 26.6% in TEP while it was 20% in TAPP procedure. Complications reported by Cohen R.V., et al<sup>10</sup> are 13.5% in TEP and 20.5% in TAPP while Yassar Hamaza et al.<sup>7</sup> reported 8% in TEP and 20% in TAPP. The proportion of complication in our study is slightly higher compared to the other studies.

In present study the mean post-operative hospital stay was 2.27 days for laparoscopic TEP repair hernia repair and 2.53 days for laparoscopic TAPP

repair. The post-operative hospital stay is statistically similar between two groups with p=0.286. Though the post-operative stay in our study was more, most of our patients were fit to be discharged on post-operative day 1. 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 many districts, because of all these factors most patients opted to stay in the hospital for a longer duration and some till suture removal; this has prompted us not to hasten the patient’s discharge.

**CONCLUSION**

The present study shows that TEP could be regarded as treatment of choice for bilateral repair of inguinal hernia. Though TEP has certain advantages over TAPP, TAPP forms an integral part of initial learning curve of laparoscopic inguinal hernia repair. Our study supports the view that laparoscopic TEP and TAPP mesh repair of inguinal hernia is safe and efficacious, but long term Randomised Control Trials with enhanced sample size and reduced confounding factors are still required to establish the absolute superiority of TEP over TAPP.

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