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Original Article

Comparative study of MESH hernioplasty using laparoscopic TAPP versus open for inguinal hernia

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ABSTRACT

Introduction: Inguinal hernias are treated by several surgical methods. Our main concern is to find a well-accepted method which is cost effective, with minimal complications, with small learning curve and can be attributed to the masses. **Objective:** To compare the two tension-free methods of hernia repair: trans-abdominal pre-peritoneal laparoscopic mesh repair and the open Lichtenstein mesh technique in terms of operative time, length of hospital stay and chronic post-operative pain and cost effective. **Materials and Methods:** This study was conducted in Department of Surgery, Fathima Institute of Medical Sciences, Kadapa during March 2013 to Feb 2015 over a period of 2 years. A total of 100 male patients, aged between 16-60 years, were divided into two groups, A and B. Patients were subjected to Trans-abdominal Pre-Peritoneal (TAPP) laparoscopic and Lichtenstein repairs, respectively. The two groups were compared for operative time, length of hospital stay, chronic groin pain and cost of surgery. Percentages were calculated for categorical data while numerical data were represented as mean ± SD. Chi square test and t test were used to compare categorical and numerical variables, respectively. Probability ≤ 0.05 ($P \leq 0.05$) was considered significant. **Results:** Mean operative duration was significantly longer in group A compared to group B ($P < 0.01$). Mean hospital stay was significantly longer in group B compared to group A ($P < 0.01$) and mean cost of the procedure was significantly high in group A as compared to group B ($P<0.01$). **Conclusion:** Trans-abdominal pre-peritoneal laparoscopic inguinal hernia repair is effective in decreasing the incidence of chronic groin pain and post-operative hospital stay in comparison with to tension free mesh hernioplasty.

Keywords: Inguinal hernia, Laparoscopy, chronic pain, TAPP repair

INTRODUCTION

Inguinal Hernia is one of the most common surgical condition in the world. Its diagnosis is made mostly by clinical examination and if required ultrasound scan can be done. The overall lifetime risk of developing inguinal hernia is 15% in men and less than 5% in women [1]. Within the last few years the use of minimal access surgery has expanded to encompass most procedures in general surgery. The use of laparoscopic techniques in the repair of groin hernia however remains controversial [2]. Evidence comparing laparoscopic and open hernia repairs has varied with time and with changes in techniques used [3]. Despite all these advances, the best and cost effective method for inguinal hernia repair has not yet been established [4]. The introduction of different varieties of prosthetic mesh has increased the interest in inguinal hernia surgery [5].

Materials and Methods: This study was conducted in Department of Surgery Fathima Institute of Medical Sciences, Kadapa during March 2013 to Feb 2015 over a period of 2 years. A total of 100 male patients, aged between 16-60 years, were divided into two groups, A and B. Patients were subjected to Trans-abdominal Pre-Peritoneal (TAPP) laparoscopic and Lichtenstein repairs, respectively. The two groups were compared for operative time, length of hospital stay, chronic groin pain and cost of surgery.

The inclusion criteria was patients with primary inguinal hernia (unilateral/bilateral), 16 to 60 years old, American Society of Anaesthesiologists class I (ASA I) and those willing to participate in the study after written informed consent. Patients with irreducible or obstructed hernia, previous lower abdominal surgery, and radio-therapy were

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excluded from the study. All these were excluded for they would act as confounders and produce bias in the study results.

All the included patients were admitted in ward through Outpatient Department a day before surgery. After admission detailed history, physical examination, investigations & pre anesthetic checkup for surgical fitness were carried out. The patients were explained the risks and benefits of the two procedures and written informed consent was obtained.

All operated patients were assessed for intraoperative difficulties, intra-operative complications, duration of surgery, post-operative pain, mobilization, post op complication and duration of hospital stay. Patients were followed after discharge on 7th postoperative day and after 6 months. They were assessed for duration to return to normal activity, chronic postoperative pain at 6 month, delayed complications like numbness, neuralgia and recurrence.

All the operative details were recorded. The operative times was recorded in minutes for both the procedures and was counted from the incision to the placement of the last suture. Hospital stay was defined as the number of nights spent in hospital postoperatively. Postoperative pain was measured qualitatively (subjectively) using Visual Analogue Scale and was graded into no pain, no discomfort during daily life activities (VSA = 0), mild pain, occasional discomfort but not affecting the quality of life (VSA =1 - 3), moderate pain, pain hampering patient's quality of life including inability to take part in sports (VSA = 4-7), and severe pain, the presence of constant or intermittent pain debilitating the patient or interfering with daily activities (VSA = 8-10). Confounding variables were controlled through strictly following the exclusion criteria.

RESULTS

Table 1: Demographic variables

	Group A	Group B
	N=50	N = 50
Age (Years)		
Mean	39.33	39.78
SD	8.88	13.41

All patients (50) in group A were operated under general anesthesia while in Lichtenstein repair group, general and spinal anesthesia both was used in 22 and 28 patients respectively. On follow up of the patients at One month interval, pain occurrence was gauged as mild, moderate and severe based on VSA score. In group A 32 (64%) patients did not experience any pain compared to 17 (34.0%) patients in group B. The ratio of severe pain in group A to B was 1:5, with severe pain occurring in 1 (2%) patients in group A compared to 5 (10%) patients in group B. Follow up of patients at Six months interval revealed absence of pain in 45 (90%) patients in group A in contrast to 33 (66%) patients in group B. The frequency of mild, moderate, and severe pain in group A was 4 (8%), 0 (0%), 1 (2%).

Table 2: Pain characteristics of patients

	Group A	Group B	P Value< 0.001
	N=50	N=50	
Pain (1 Month)			
None, N(%)	32 (64)	17 (34)	
Mild, N(%)	12 (24)	15 (30)	
Moderate, N(%)	5 (10)	13 (26)	
Severe, N(%)	1 (2)	5(10)	
Pain (6 Months)			0.001
None, N(%)	45 (90)	33 (66)	
Mild, N(%)	4 (8)	12 (24)	
Moderate, N(%)	0 (0)	3 (6)	
Severe, N(%)	1 (2)	2 (4)	

Mean hospital stay was 1.51 ± 0.66 days in group A compared to 2.81± 0.69 days in group B, which proved to be significant on statistical analysis (P <0.001). The mean operative duration was 60.33 ± 14.56 minutes in laparoscopic group as compared to 41.11 ± 9.61 minutes in the Lichtenstein hernia repair group proving to be significant on statistical analysis (P < 0.001). Mean cost of surgical disposables, anesthesia drugs and postoperative drugs excluding Hospital charges, fee of the surgical and anesthetic team and infrastructure and equipment cost in group A was triple as compared to group B proving to be significant on statistical analysis (P < 0.001).

DISCUSSION

The ideal repair should allow the patient rapid return to work, leisure and recreation at a reasonable cost to the patient and the wider

community. The laparoscopic technique has replaced the open approach in many surgical procedures and now laparoscopic procedures for inguinal hernia are gradually replacing open procedures, those who favor using the laparoscope for hernia repair state chiefly the belief that laparoscopic hernia repair is more desirable for the patient.

Our study concluded the superiority of laparoscopic (TAPP) repair over the open mesh repair in terms of post-operative pain occurring after one month and six months intervals follow up. Most of the patients (64.38%) operated laparoscopically experienced no pain as compared to (34.1%) patients operated by Lichtenstein repair. So there was a net 30% reduction of pain in Laparoscopic procedure. On follow up of the patients at One month interval, pain occurrence was gauged as mild, moderate and severe based on VSA score. In group A 32 (64%) patients did not experience any pain compared to 17 (34.0%) patients in group B. The ratio of severe pain in group A to B was 1:5, with severe pain occurring in 1 (2%) patients in group A compared to 5 (10%) patients in group B.

Follow up of patients at Six months interval revealed absence of pain in 45 (90%) patients in group A in contrast to 33 (66%) patients in group B. The frequency of mild, moderate, and severe pain in group A was 4 (8%), 0 (0%), 1 (2%). Macintyre et al, compared the postoperative pain in both types of repairs. Their study results, in corroboration to our findings, reveal that pain occurrence was significantly less in Laparoscopic versus the Lichtenstein repair.

Another finding from our study was that the rate of occurrence of long term severe pain was insignificant in both procedures. This signifies and verifies the fact that early post-operative results of minimal access surgeries are encouraging in terms of hospital stay, pain of mild, moderate and severe degree and early return to job and daily life activities. However, as mentioned earlier, both procedures being tension free open re-pair gives almost similar results in terms of long term post-operative pain. The pain incidence on long term follow up diminishes to insignificant levels.

Our result is reconfirmed by randomized control trials as by other studies which reveal a significantly longer mean operating time in Laparoscopic hernia repair [6-13]. In accordance to with our study others have reproduced similar results so far operative duration was considered.

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