

Comparative study between Laparoscopic Trasabdominal Preperitoneal (TAPP) inguinal hernia repair and open mesh repair in Medical city.

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Summary:

Background: Inguinal hernias are a common medical problem that can significantly decrease the quality of life. Repair of inguinal hernia is one of the commonest surgical procedures worldwide irrespective of the country, race, or socioeconomic state. The inguinal hernia repair has been a controversial area in surgical practice from the time it has been conceived. Laparoscopic inguinal hernia repair has shown a great deal of promise as a treatment for the condition.

Objectives: To compare the outcome of laparoscopic versus open inguinal hernia mesh repair in terms of operative time, analgesics requirement, postoperative complication, hospital stay and return to daily activities and work.

Patients and methods: A prospective study of 80 patients with inguinal hernia repair, carried out during the period from January 2010 till January 2013, Baghdad Teaching Hospital\Medical City, Iraq, to compare the effectiveness and safety of laparoscopic and conventional open mesh techniques. Those patients were divided into 2 groups (each group of 40 patients); 1st group treated by laparoscopic (TAPP) repair and the 2nd one by open technique (mesh repair).

Results: The mean operating time in laparoscopic repair was 55 minutes (45-120) while in open repair it was 38 minutes (30-110). The laparoscopic repair was superior to open repair in regard to; less analgesic requirement post operatively, short hospital stay, and faster return to daily activities and work.

There was no statistically significant difference between the two groups regarding complications.

Conclusion: Laparoscopic hernia repair is equally safe and can provide less postoperative morbidity in experienced hands. Therefore laparoscopic hernia repair can be safely recommended for most cases of inguinal hernia unless laparoscopy itself is contraindicated.

Keywords: Inguinal hernia repair, Open, Laparoscopic.

Introduction:

Groin hernia repair is one of the most common elective general surgical operations. Yet there has been no universal consensus on the ideal repair, which would overcome the potential problems of wound infection, recurrence, and chronic groin pain. Over the last two centuries there have been a number of procedures described for the repair of inguinal hernias, beginning with the Marcy repair and the milestone Bassini repair up to the present era of laparoscopic inguinal hernia repair. However, minimal access approaches to inguinal hernia repair have added to the ongoing debate over the "best groin hernia repair" (1,2). There are two standardized techniques of laparoscopic inguinal hernia repair, transabdominal preperitoneal repair (TAPP), described by Arregui in 1992(3), and total extra peritoneal repair (TEP), described by McKernan and Laws in 1993 (4).

Patients and methods:

A prospective study of 80 patients with inguinal hernia, carried out during the period from January 2010 till January 2013 in Baghdad Teaching Hospital\Medical City, Iraq, to compare the

effectiveness and safety of laparoscopic and conventional open mesh techniques. Those patients were divided into 2 groups (each group of 40 patients); 1st group treated by transabdominal preperitoneal laparoscopic repair (TAPP) and the 2nd one by conventional open mesh repair. Four patients with laparoscopic repair have bilateral inguinal hernia while only one patient with open repair have bilateral inguinal hernia. Patients unfit for general anesthesia (severe cardiac or pulmonary diseases), Very big inguinal hernia., Obese patient, Emergency cases, pregnancy and Absolute contraindication to laparoscopy (large ventral hernia, history of laparotomy for intestinal obstruction, ascites with abdominal distension) were excluded from both groups.

Patients Methods:

After confirming the diagnosis of inguinal hernia by history, clinical examination and ultrasound, Informed consent from the patients was taken and the patients then prepared for surgery. The surgeries were performed and followed up by the same consultant surgeons in the 1st surgical unit, Baghdad teaching hospital. In case of open inguinal hernia repair, the method of anesthesia was chosen by the anesthetist in

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consultation with the patient. Twenty four patients underwent open repair under general anesthesia and 16 patients under spinal anesthesia. All patients with laparoscopic inguinal hernia were operated upon under general anesthesia. All patients were given antibiotic prophylaxis using 1gm cefotaxim intravenously at the time of induction. All the patients have received analgesics(Tramadaol) in day 0, later on the analgesics were given according to patients demand.

Techniques of hernia repair:

1.Laparoscopic technique:

In this study, TAPP (transabdominal preperitoneal repair) was used:

Position:

The surgeon stands on the opposite side of the table from the hernia. The first assistant stands opposite the surgeon.

Procedures:

Three laparoscopic trocars are placed in a horizontal plane with the umbilicus. A 10-mm trocar above the umbilicus allows the surgeon to use the larger 10-mm laparoscope and facilitates the introduction of a sufficiently sized mesh into the peritoneal cavity. The two additional trocars are placed just lateral to the rectus muscles. An incision of the peritoneum is initiated at the medial umbilical ligament at least 2 cm above the hernia defect and extended laterally toward the anterior superior iliac spine. The preperitoneal space is exposed using a combination of blunt and sharp dissection, mobilizing the peritoneal flap inferiorly. The symphysis pubis, Cooper's ligament, the iliopubic tract, and the cord structures are identified. Direct hernia sacs are reduced during this dissection. Indirect sacs are more difficult to deal with, as they can be tenaciously adherent to the cord structures. The cord must be skeletonized, but care must be taken to minimize trauma to prevent damage to the vas deferens or the blood supply to the testicle. A small sac should be reduced, but if it is large and/or extending into the scrotum, it may be divided. The proximal sac is then closed before reduction, and the distal sac is opened distally as far as possible on the side opposite the cord. Finally, the peritoneal flap is dissected inferiorly proximal to the divergence of the vas deferens and in the preperitoneal space and will not roll up when the peritoneum is closed. A large piece of mesh, 15x 10 cm, is introduced into the abdominal cavity through the umbilical trocar and is positioned over the myopectineal orifice so that it completely covers the direct, indirect and femoral spaces. The landmarks for fixing the prosthesis are the contralateral pubic tubercle and the symphysis pubis for the medial edge, Cooper's ligament or the tissue just above it for the inferior border, and the posterior rectus sheath and transversalis fascia at least 2 cm above the hernia defect superiorly using the trocar. Tacks are never placed below the iliopubic tract when value <0.05) In open repair 68.6% of the patients needed more than 3 weeks to return to work; while in

lateral to the internal spermatic vessels, to minimize the chance of damage to the lateral cutaneous nerve of the thigh or the femoral branch of the genitofemoral nerve. The prosthesis extends laterally to a point past the anterosuperior iliac spine to assure wide overlap. When closing the peritoneum, it is important to avoid gaps because small bowel has been known to find its way through them, resulting in a clinical bowel obstruction. Bilateral hernias were repaired using two separate peritoneal incisions.

2.Open technique:

The conventional tension free mesh repair open technique for inguinal hernia(Lichtenstein's operation) was done in this study under general anesthesia or spinal anesthesia .

Outcome parameters:

The following parameters were recorded: Operative time, postoperative analgesia, hospital stay, postoperative complications and return to daily activity and work were recorded. At postoperative visit, 8 days after discharge, the state of general health was recorded. Operative areas were examined for evidence of wound infection, seroma, hematoma and neuralgia. The patients were followed up to 6 months postoperatively, where they have been assessed monthly for general health conditions and detection of any possible complication.

Statistical methods:

By using SPSS (Statistical Package for the Social Sciences by IBM) software for window version 16, USA, ANOVA test, P. value less than 0.05 considered significant statistical relation.

Results:

The median age of the patients was 37years ranging between (16yr-58yr), 75 patients (93.7%) were males while only 5 patients (6.3%) were females. Regarding the types of inguinal hernia ; 29 patients (72.5%) had indirect and 11 patients (27.5%) had direct in each group. In our study, regarding the site of the hernia, 23 patients (57.5%) had right sided inguinal hernia , 13 patients (32.5%) had left sided hernia and 4 patients (10%) were with bilateral hernia managed by laparoscopic repair, while 24 patients (60%) had right side and 15 patients (37.5%) had left sided and 1 patient(2.5) had bilateral inguinal hernia managed by open mesh repair. In open repair, the mean operating time was 38 minutes (30-110) while in laparoscopic repair it was 55 minutes (45-120). In open repair, 37.5% of the patients required analgesia during the second postoperative day; while in laparoscopic repair only 12.5% of the patients needed analgesia during the same postoperative day (P-value <0.05). In open repair 42.5% of the patients needed more than 5 days to return to daily activities; while in laparoscopic repair it was only 12.5% of patients require more than 5 days. (P-

laparoscopic repair it was 20%. (P-value <0.05). In open repair 45.7% of the patients needed more than 24

hours hospital stay; while in laparoscopic repair it was 14.3%.(P-value <0.05). All these parameters were statistically significant (P-value <0.05) in favor for laparoscopic repair.

Table (1). Comparison Between Open And Laparoscopic Repair Of Inguinal Hernia

Postoperative follow up	Open repair No. of patients	%	Laparoscopic repair No. of patients	%	P-Value
Analgesic requirement					
Day 0	40	100	40	100	0.1
Day1	34	85	20	50	0.03
Day2	15	37.5	5	12.5	0.01
Return to Daily activity					
2-5 days	23	57.5	35	87.5	0.03
>5 days	17	42.5	5	12.5	0.01
Return to work					
2-3 weeks	14	32.5	32	80	0.02
>3 weeks	26	68.6	8	20	0.01
Hospital Stay					
24 hours	22	54.3	34	85.7	0.03
>24 hours	18	45.7	6	14.3	0.01

Most of the postoperative complications were observed after open repair as compared to laparoscopic repair, but none was statistically significant. In the open repair group, patients complained postoperatively from neuralgia 12.5%, urine retention 5%, wound infection 5%, recurrence 2.5%, seroma 5% and hematoma 5%; while in the laparoscopic repair, the postoperative complications were; neuralgia(8.6%), wound infection (5%),urine retention, recurrence, seroma and hematoma were (2.5%) each. Table 2 shows postoperative complications.

Table (2) postoperative complications

Complic-Ations	Open Repair		Laparo-scopc Repair		P-Value
	No. Of Patients	%	No. of patients	%	
Seroma	2	5	1	2.5	0.06
Hematoma	2	5	1	2.5	0.06
Neuralgia	5	12.5	3	8.6	0.07
Wound Infection	2	5	2	5	0.1
Urine Retention	2	5	1	2.5	0.06
Recurrence	1	2.5	1	2.5	0.1

Discussion:

According to our knowledge, This is the first local study regarding laparoscopic inguinal hernia repair published in Iraq. Minimal access surgery requires different skills and technological knowledge. With a clear diagnosis of complicated cases, the skill and experience of the surgeon should be considered for the selection of operating method. (5,6) The operative

time to perform inguinal hernia repair has frequently been reported as longer for laparoscopy compared to open repair.(7) In our study the mean operating time was 38 minutes (35-110) for open repair; while in laparoscopic repair 55 minutes (45-120), i.e. the mean operating time was about 17 minutes shorter in open repair as compared to laparoscopic repair and this is comparable to the result of a study done by Satod et al(183 patients), where the mean difference was 14.8 minutes in favor of open repair, while in the study of G. Dedemadi et al(56 patients) the operating time for laparoscopic repair was 43-67 minutes and for the open repair was 37- 55 minutes, which was of statistical significance in favor of open repair.(5,8) A study by Ke Gong et al (164 patients) revealed no significant differences between the operating time of open repair (40-120 minutes) and laparoscopic repair (50-120 minutes). (6,7,8,9,10) From this we can conclude that the operating time varies between surgeons and also vary considerably between centers, it reduces with experience and comparison between laparoscopic and open surgery is subjected to the pre-existing familiarity with open technique. In general all laparoscopic procedures are more time consuming due to the nature of slow maneuvers of laparoscopic techniques, e.g. the careful slow insufflations and routine peritoneal checkup before starting any laparoscopy. Considering the postoperative analgesic requirement, in our study regarding the open repair group 37.5% of the patients required analgesia during the second postoperative day, while in laparoscopic repair, only 12.5% of the patients required analgesia during the same postoperative day and this is in favor of laparoscopic repair and it is of nearly similar results of the study performed by Ke Gong et al, which revealed the requirement of analgesia for the patients with open hernia repair for 3-4 days and only 1 day for

the laparoscopic repair(6,7,8,9,10) In our study, 45.7% of the patients with open repair group needed more than 24 hours hospital stay; while in laparoscopic repair group it was only 14.3%and this is in favor of laparoscopic repair. Ke Gong et al study had the following results; hospital stay in open repair group was 2.5-7.5 days compared to 2.4-4.7 days in laparoscopic repair group; while in G. Dedemadi et al, the average hospital stay of laparoscopic repair group 10-24 hours compared to 16-26 hours in the open repair group, which is of statistical significance, in favor of laparoscopic repair.(11,12,13,14.) In this study in respect to the return to daily activities, in open repair 42.5% of the patients needed more than 5 days to return to daily activities, while in laparoscopic repair it was 12.5% in favor of laparoscopic repair. In G. Dedemadi et al study; the patients of laparoscopic group needed 5-21 days to return to daily activities ,compared to 9-31 days in open repair group, which was in favor of laparoscopic group. (19,20,21,22)

In this study, all the postoperative complications (seroma, haematoma, infection, urine retention, neuralgia and recurrence) were of no statistical significance and this is similar to the results obtained by J.F.Tschudi et al(120 patients) and F.Lovistto et al (175 patients) and G. Dedemadi et al, while in Satod et al study the incidence of seroma and haematoma was in range of 5-25% of the patients with laparoscopic repair and it is of statistical significance(13) Laparoscopic hernia repair is more expensive to perform than the open repair due to the extra equipment used with. Secondary cost attributed to the perceived increase in operating time for laparoscopic repair. (14)

Conclusion:

Laparoscopic inguinal hernia repair is equally safe and can provide less postoperative morbidity in experienced hands , as open hernial repair .Therefore laparoscopic hernia repair can be safely recommended for most cases of inguinal hernia unless laparoscopy itself is contraindicated. With better training in minimal access surgery now available , the time has arrived for it to take its place in the surgeons repertoire .

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