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Comparison of different methods of repair of para-umblical hernia, and their associated surgical outcomes

Sadaf Nazir, Abdul Jabbar Mirani, Shua Nasir, Muhammad Saad Tai, Ahmed Ali

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Abstract

Object: The aim of our study is to compare the effectiveness of laparoscopic para umbilical hernia repair, with open repair of para-umblical hernia and the factors associated with each surgical intervention.

Method: The type of study is a prospective randomized trial, which was conducted at a tertiary care hospital for a period of 2 years from April 2013 to April 2015. The patients presenting with para umbilical hernia, who were fit for operation were included in the study, and divided into two groups accordingly. Group A included patients undergoing laparoscopic repair, while group B included patients undergoing open repair. Various variables of the two procedures were studied and data was analyzed using SPSS 20.

Results: The total study population consisted of 320 patients, the mean age of the patients being 42.2 +/- 10.01 years in group B, and 38.25 +/- 12.02 years in group A. The overall duration of repair was considerably shorter for the open repair group, and the overall incidence of complications was higher in the open repair group. The recurrence rate was significant in both the groups ($p<0.05$) and they were due to post operative wound infection. The recurrence rate in laparoscopic group was more in patients who had a bigger size defect. The length of hospital stay was shorter for laparoscopic group as compared to the open repair group. The cosmetic result was better for the laparoscopic group due to small incision sizes.

Conclusion: According to our study based on the various factors studied, laparoscopic hernia repair proved to be a more effective method and provided a safer alternative to the conventional open mesh repair, however more studies are required to solidify our findings.

Keywords: Laparoscopic umblical hernia repair, surgical outcome, mortality & morbidity of para-umblical hernia, open mesh repair for umblical hernia

Abbassi Shaheed Hospital
S Nazir

Kulsoom Bai Valika Social Security Hospital
AJ Mirani

Dr. Ziauddin Hospital
S Nasir

Civil Hospital
A Ali.

Correspondence:
Dr Ahmed Ali
A – 139, Block I, North Nazimabad karachi.
cell:0333-2143259
email: doctor.karachi@gmail.com

Introduction:

A common surgical problem faced by surgeons over the world is para umbilical hernia, and it is also a very commonly repaired surgical defect[1]. Tension free suture repair is the traditional method for repair, but due to recurrence it is losing its appeal. Mesh repair is fast taking its place[2]. But surgical complications such as infection, and wound dehiscence is now making its effectiveness questionable and paving a way for newer techniques to take its place. Recently the field laparoscopic surgery has advanced, and laparoscopic repair of the para umbilical hernia is promising to be a great alternative to the conventional methods[3,4] it is superior as it decreases the time duration, complications, pain, morbidity and mortality[5-7]. In our study we compared the two procedures, laparoscopic versus open repair for para-umblical hernia, and contrasted them according to the duration of the procedure, complications, time required for hospital stay, pain, morbidity, mortality and end cosmetic result.

Materials and methods: The type of study is a prospective randomized trial, which was conducted at a tertiary care hospital for a period of 2 years from April 2013 to April 2015. The

patients presenting, via out patient clinics or accidents and emergency department with para umbilical hernia, who were fit for operation were included in the study, and divided into two groups accordingly. Group A included patients undergoing laparoscopic repair, while group B included patients undergoing open repair. After having signed a consent form, the patients were educated about both the methods of repair in terms of technique, complications, advantages and disadvantages. The patients were divided into the groups using a random number generator. The exclusion criteria included patients who were <18years old or >70 years old, also emergency hernia repairs were excluded, incarcerated, recurrent and hernias of too large a size were also not included in the study. The patients who had underwent laparoscopic procedure, and had to be converted to open repair for any number of reasons including but not limited to difficulty in adhesiolysis, bleeding or perforation were no included. All the patients were operated under general anesthesia, in the supine position. Standard baselines parameters were monitored throughout the procedure, like blood pressure, ECG, pulse etc. In the laparoscopic group, bladder and stomach were decompressed and pneumoperitoneum was created with the use of verress needle the palmers point or by open access technique. Three port laparoscope was used, the abdomen and the contents of the hernia sac was inspected, the contents were reduced and adhesions were removed with scissors or scalpel. The size of the defect was measure and appropriate size mesh was placed, which was made larger in size in relation to the defect, so as to provide mechanical strength. Sutures were used to fix the mesh material, and then buried in subcutaneous tissue, tacker was also utilized to further fix the mesh. For open repair, the patients were operated under general anesthesia, antibiotics were administered and similar measurements were used as in laparoscopic repair. Transverse incision was given on the skin, over the bulge near the umbilicus, the fatty tissue was removed and the sac and its materials were identified. The sac was opened with scalpel and omentum bulged out. The incision was widened, the contents were removed, and the margins of the defect were held in place with an Ellis forceps. The content of the sac were reduced in the abdominal cavity, a non absorbable suture was used to close the defect, and a proline mesh was used and fixed with stitches to provide the mechanical strength required. Hemostasis was established and wound was closed with a drain placed in the depths of the wound for to collect any blood or secretions, and prevent hematoma formation. After the procedure two more doses of antibiotics were given to prevent infection. All the procedures were performed by the same team of surgeons, the patients were followed for three months initially and then after every six months, for a period of two years.

Data was analyzed using SPSS 20. The different variables that were studied, included the time duration of the procedure, complications, morbidity and mortality. Descriptive statistics were analyzed using the means, standard deviations, frequencies and percentages. Chi square, and fishers exact tests were used for categorical variables. Independent sample two tailed T test, was utilized for the comparison of the continuous variables. A p-value of less than 0.05 was considered to be statistically significant.

Results:

The total study population consisted of 320 patients, the mean age of the patients being 42.2 +/- 10.01 years in group B, and 38.25 +/- 12.02 years in group A. The patients were divided into the groups equally, having 160 patients in each group. Group A had 36 (22.5%) males and 124 (77.5%) females. Group B had 57 (35.62%) males and 103 (64.375%) females. The range of the size of defect was between 2.5cm to 4.5cm respectively. The overall duration of repair was considerably shorter for the open repair group, and the overall incidence of complications was higher in the open repair group. The recurrence rate was significant in both the groups ($p<0.05$) and they were due to post operative wound infection. The recurrence rate in laparoscopic group was more in patients who had a bigger size defect. The length of hospital stay was shorter for laparoscopic group as compared to the

open repair group. Needless to say the cosmetic result was better for the laparoscopic group due to small incision sizes. The mean length of stay from patients in group A with complications was 4.37 +/- 0.905 days, and without complications 2 +/- 6.2 days, while for open repair group and those who had complications the mean length of stay in the hospital was 11.6 +/- 4.6 days and in those without complications it was 5 +/- 1.3 days. The various variables concerning both the groups are hown in table 1.

Discussion:

Table-1: Comparison of various variables among the two groups. N=320, group A= 160, group B= 160

Variable	Laparo-scopic	Open mesh repair	P-value
Duration of surgery			
40-60 mins	22 (14.19%)	72 (45.05%)	
61-90 mins	97 (60.64%)	49 (30.76%)	
>90 mins	41 (25.16%)	39 (24.37%)	
Complications			
Seroma	6 (4.03%)	18 (11.48%)	P<0.001
Intestinal Injury	0 (0%)	3 (2.27%)	
Hematoma	2 (1.61%)	37 (23.64%)	P<0.001
Prolonged Ileus	11 (7.25%)	51 (32.43%)	P<0.001
Bleeding	9 (5.64%)	11 (7.43%)	
Cellulitis	5 (3.22%)	0 (0%)	
Wound Infection	3 (2.32%)	13 (8.39%)	P<0.001
Prolonged pain >4months	3 (2.41%)	13 (8.7%)	
Wound dehiscence	0 (0%)	9 (6.08 %)	
Port herniation	1 (0.625%)	0 (0%)	
Recurrent hernia	10 (6.62%)	14 (9.35%)	

The advent of laparoscopic repair began in the year 1993, with due respect to the advantages of laparoscopic repair over the conventional open approach[8]. The overlap of the defect using a mesh is known to be the prime factor responsible for the success of the procedure, along with minimum tissue handling which makes it a more favorable option. The shorter hospital stay, decrease incidence of problems concerning the wound, and a lower recurrence rate are the various advantages the laparoscopic procedure provides over traditional repair[9-11]. In our study the total duration for the laparoscopic procedure was longer as compared to the open repair, which is consistent with similar studies[9]. The handling of mesh intra peritoneally takes the most amount of time, but this can be made effective with the use of various novel techniques being developed[12]. The rate of complications was higher for the open repair group. Since we did not involve the patients who needed conversion from laparoscopic to open repair due to injury to the bowel it is not mentioned in the results, but during the study some patients 2 had to be converted to open repair, studies suggest that about 2.1% of laparoscopic cases need conversion due to bowel injury, which might be attributed to excessive adhesiolysis, some studies also suggest that the perforated bowel be treated as an emergency and the actual repair can be done later[13-15]. Compared to other studies the incidence of seroma was low in our study[16,17]. According to a study there was 100% incidence of seroma on sonographic studies[18]. The prolonged ileus was seen in 11 (7.25%) in laparoscopic group and 51 (32.43%) in the open repair group, which is consistent with other studies which report an incidence of 1-8% of prolonged ileus in the laparoscopic hernia repairs[11,19]. Our study reports wound infection being 3 (2.32%), in laparoscopic group and 13 (8.39%) in the open repair group, which is also confirmed by another study which reports lower incidence of wound infection in the laparoscopic repair[20]. The use of bigger incisions and more handling of the tissues is attributed to the increased incidence of infection in the open repair group, which is a significant contributor to morbidity. The higher complication in open repair was more due to wound infections 13 (8.39%) and prolonged ileus 51 (32.43%), and both these complications were lower in the laparoscopic group which is consistent with some studies[21]. Contrary to some reports [22], the prolonged pain (8.7%) in open repair group and (2.41%) in laparoscopic group was inconsistent with previous studies[22]. The recurrence rate for laparoscopic group was 10 (6.62%) and the open repair group it was 14 (9.35%), the majority of recurrences in the laparoscopic group occurred in the 18 months post operatively, and majority of them were due to

post operative infection of the wound, which is in line with similar studies[23], which shows higher incidence of recurrence in secondary hernias. In patients without complication in the laparoscopic group the length of stay was shorter by about 2 days, which is in line with other studies[21].

Conclusion:

we conclude that laparoscopic hernia repair proved to be a more effective method and provided a safer alternative to the conventional open mesh repair, however more studies are required to solidify our findings.

Role and Contribution of Authors:

Dr Sadaf Nazir Senior Registrar, Unit-III, Abbasi Shaheed Hospital, concept drafting writeup final layout

Dr Abdul Jabbar Mirani, Assistant Professor & HOD, Deptt of Surgery, write up statically analysis data collection

Dr Shua Nasir write up drafting

Dr Muhammad Saad Tai data collecting and data entering

Dr Ahmed Ali analysis data entering

Conflit of interest: None

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