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Original Research Article

Comparative study between herniorrhaphy alone versus hernioplasty in small-sized paraumbilical hernia

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ABSTRACT

Background: Paraumbilical hernia is a common disease and its repair is one of the most performed surgical interventions worldwide. The most important techniques in its repair are hernioplasty and herniorrhaphy and both differ significantly.
Methods: We conducted a prospective randomized controlled trial to compare hernioplasty versus herniorrhaphy alone in small-sized paraumbilical hernia as regards local wound complications e.g., seroma and wound infection in addition to recurrence rates, operation time and overall cost, by comparison between two groups each comprising 50 patients.
Results: There was no significant difference between both techniques regarding hernia recurrence as well as wound complication. On the other hand, herniorrhaphy reduced significantly incision size, time of operation and overall cost.
Conclusions: Our study revealed that herniorrhaphy alone is better in small-sized paraumbilical hernia repair as it showed significant correlation with decrease incision size, time of operation and overall cost.

Keywords: Paraumbilical, Herniorrhaphy, Hernioplasty

INTRODUCTION

Paraumbilical hernia is one of the most common hernias among anterior abdominal wall hernias and constitutes about 85% of the overall ventral abdominal wall hernias. It is considered the 2nd most common type of all hernias in Egypt. Paraumbilical hernia rarely occurs in children and it is more common in adults, especially in women than men.[1] The two dominating repair techniques of paraumbilical hernia are suture and mesh repair, both having multiple sub-techniques**.** During the past decade, the pendulum has been slightly in favor of mesh repair, with lower recurrence rates. Meanwhile, other authors challenge the pole position of mesh, and the most recent meta-analysis found no significant difference in complication rates.[2]

Recurrence of hernia has been the most important and determining variant between both techniques. Several factors have been responsible for recurrence after paraumbilical hernia repairs**.** Large seroma and surgical site infection are classical complications and are major causes for recurrence.[3]

Incidence of surgical site infection increases in patients with old age, obesity, diabetes mellitus, malnutrition, prolonged preoperative hospital stay and systemic immunocompromising drugs. Another significant risk factor for wound infection is prosthetic mesh repair which was found to be associated with higher rates of infection than simple suture repair only.[4]

Objectives

We aim to compare the outcome of direct suture repair and mesh repair in small sized paraumblical hernia (defect less than 3 cm as measured by U/S).

METHODS

The prospective controlled trial study was carried out at Menoufia University Hospital starting from March 2019 until December 2019 including a 6-month follow-up period. The study included 100 patients divided into two groups before operation by the use of sealed envelopes technique:

Group 1 was included 50 patients randomized to paraumbilical hernioplasty with mesh insertion.

Group 2 was included 50 patients randomized to paraumbilical herniorrhaphy (anatomical repair only).

Inclusion criteria were uncomplicated paraumbilical hernia patients aging 21-55 years old with small defect size (less than 3 cm) by preoperative ultrasound.

Patients with defect more than 3 cm, complicated or recurrent paraumbilical hernias were excluded from the study.

Clinical assessment

All patients in both groups were subjected to preoperative clinical assessment, all of them were assessed for vital signs, associated medical diseases (diabetes, hypertension and renal, pulmonary and heart diseases).

Laboratory assessment

Complete blood count, blood sugar, liver function tests and international normalized ratio were drawn.

Abdominal ultra-sonography

It was used to determine the size of the abdominal wall defect, and revealing the hernia contents and associated pathology.

Surgical technique

All patients were operated on by a fixed team of surgeons and received a single dose of preoperative prophylactic antibiotic administered intravenously.

A transverse incision was made, and the sac was dissected all around. Opening of the sac at the neck and exposure of the contents was done then excision of the sac. Suture (anatomical) repair of the defect was done using polyprolene sutures. In group (1), mesh was then inserted and fixed with interrupted polyprolene sutures, while in group (2) and only anatomical suture repair was done without mesh use.

Both groups were compared according: size of incision, time of operation, occurrence of wound complications including infection and seroma, recurrence rate and overall cost during the period of follow-up which was six months.

Statistical analysis

The collected data was revised, coded, tabulated and introduced to a PC using Statistical package for Social Science (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Data were presented and suitable analysis was done according to the type of data obtained for each parameter

RESULTS

As regarding comparison of gender of patients in both groups: In group (1): 19 males (38% of group) and 31 females (62% of group), while in group (2): 23 males and 27 females with p=0.48 (Table 1).

As regarding comparison of age of patients in both groups, it was found that: In both groups the range of age was 27-55 years old with p=0.642 (Table 1). There were significant differences between both groups as regarding operative details.

Table 1: Demographics of the studied groups.

		Group statistics					
		Hernioplasty (n=50)		**Herniorrhaphy (n=50)**		**t test**	**P value**
Age (in years)	Mean±SD	43.34±7.70		42.60±8.17		0.466	0.642
	Range	27-55		27-55			
	Mean differences	0.740					
		No.	**%**	**No.**	**%**	**X^2**	
Sex	Male	19	38	23	46	1.67	0.48
	Female	31	62	27	54		

SD: standard deviation t: student t test X^2: chi-square.

Drain was inserted in only 33 patients of group (2) while all patients of group (1) had drains inserted p≤0.001. Incision size mean in group (1) was about 10.47±1.33 cm. while in group (2) it was only 8.38±0.92 cm with p≤0.001. Also, operation time was reduced in herniorrhaphy group with a mean 30.20±3.15 minutes while in hernioplasty group was 40.06±3.26 minutes with p≤0.001. This had a significant impact on overall financial cost among both groups with a mean of 1712±284.38 Egyptian Pounds in group (1) and of

1419±154.49 Egyptian Pounds in group (2) with also p≤0.001 (Table 2). In comparison between both groups in wound complications, it was found that seroma occurred in three patients of group (1) and one patient in group (2) p=0.307. Infection occurred in four patients in group (1) while only one patient in group (2) had wound infection p=0.169. Dehiscence occurred in only one patient in group (1) with p=0.315 (Table 3).

As regarding recurrence rates, both groups had no statistically significant differences during the 6-month follow-up period; only one case had hernia recurrence, which was identified clinically and by ultrasonography after 5 months of operation in group (2) while no cases in group (1) had hernia recurrence during the period of follow-up with p=0.315 (Table 4).

Table 2: Difference of operative details between both groups.

Operative details		Hernioplasty (n=50)	Herniorrhaphy (n=50)	P value
Drain insertion		50	33	<0.001*
Incision size (cm)	Mean±SD	10.47±1.33	8.38±0.92	<0.001*
	Range	8-14	6.90-10.40	
	Mean differences	2.092		
Time of operation (min)	Mean±SD	40.06±3.26	30.20±3.15	<0.001*
	Range	32-45	25-40	
	Mean differences	9.860		
Overall cost (LE)	Mean± SD	1712±284.38	1419±154.49	<0.001*
	Range	1200-2400	1200-2200	
	Mean differences	293.000		

Table 3: Difference between both groups in wound complications.

Complications	Hernioplasty (n=50)	Herniorrhaphy (n=50)	P value
Seroma	3	1	0.307
Infection	4	1	0.169
Wound dehiscence	1	0	0.315

Table 4: Comparison between both groups regarding recurrence rates.

Recurrence rates		Group statistics						X^2	P value
		Hernioplasty (n=50)		Herniorrhaphy (n=50)		Total (n=100)			
		N	%	N	%	N	%		
3rd month	No	50	100.00	50	100.00	100	100.00	0.00	1.000 NS
	Yes	0	0.00	0	0.00	0	0.00		
6th month	No	50	100.00	49	98.00	99	99.00	1.01	0.315 NS
	Yes	0	0.00	1	2.00	1	1.00		

X^2: chi-square, NS: non-significant.

DISCUSSION

Abdominal wall hernias are one of the most common surgical problems. They are mainly caused by any condition that increases the pressure in the intra-abdominal cavity.[5]

Postoperative complications such as wound seroma occur in 5.6% to 42% of cases using the meshes for paraumbilical hernia repair. It can be the reason for postoperative wound infection, suppuration and hernia recurrence.[6]

We had all our patients operated on by a fixed team of surgeons divided into two groups; group 1 with mesh repair and group 2 with only anatomical repair without mesh. All patients completed a 6-month follow-up period with interval reviews for detection of any complications.

Our results regarding operation time was accurately resembling those of Kaufmann et al, who revealed that operation time in hernioplasty group averaged 44 minutes which is longer that the 33-minutes average of operation time in herniorrhaphy group.[7]

On the other hand, these results disagree with Malik et al, who showed that longer duration of operation was required in Suture repair patients than in Mesh repair patients.[8]

Regarding incision size and overall financial cost, our results proved a significant difference between both groups; the mean of incision size in hernioplasty group was 10.47±1.33 cm. while in group (2) it was only 8.38±0.92 cm. with p-value= <0.001. Overall costs were significantly reduced to a mean of 1419±154.49

Egyptian Pounds in group (2) while in group (1) it was 1712±284.38 Egyptian Pounds with p-value= <0.001

Regarding wound complications, our data showed that the need for insertion of drain was significantly reduced among herniorrhaphy group (66%) than in hernioplasty group (100%), with p<0.001, as well as wound infection which occurred in four cases in hernioplasty group (8%) compared with one case of wound infection in herniorrhaphy group (2%).

These data agreed with Anjum et al, whose results showed that suture repair group had two cases (8%) of wound infection, but group B (mesh repair) has recorded four cases (16%) of wound infection.[9]

Furthermore**,** our results coincide with Kensarah, 7% of patients in the group A (mesh repair) suffered from postoperative wound infection, while only 4% of group B patients suffered that.[10]

These results also agree with Kaufmann et al, that revealed a slightly higher incidence of wound infection in Mesh group than in non-mesh group.[7] This study also showed no statistically significant difference between both techniques regarding incidence of seroma formation postoperatively which is identical to our basic results.

Recurrence is another major item among our results along with wound complications. Our results showed that only one case of hernia recurrence occurred among suture repair group after five months of follow-up detected clinically and by ultrasound and which required re-operation compared with no recorded cases of recurrence among mesh group.

These results give no statistically significant differences between both groups, thus agree with Dalenback et al, who carried out a long-term follow-up after elective adult paraumbilical hernia repair and revealed that the difference in recurrence rates did not reach statistical significance.[2]

These findings are close to those of Sadiq et al, which showed that there was no recorded difference in recurrence rates after six months of follow-up.[11] The only recorded recurrence cases were after one year of follow-up; two cases in suture repair technique group and one case in herniorrhaphy group which still gives no statistically significant difference.

They also coincide with Amin et al, whose records were almost identical to ours regarding recurrence after a 6-month follow-up period; one case in non-mesh group and none in hernioplasty group.[12] Also, Anjum et al, found no significant difference between both techniques in recurrence rates; 3/25 in suture repair group and 1/25 in mesh repair group with no relation to the type of anesthesia used.[9,13]

On the other hand, these results regarding recurrence rates disagree with those of Kaufmann et al, who recorded an incidence of 9% of recurrence among suture group compared with only 1% incidence in Mesh group.[7]

CONCLUSION

Our study revealed that anatomical non-mesh repair of small-sized paraumbilical hernia had significant correlation with shorter duration of operation, smaller incision size and lowered overall costs than mesh repairs. Our study showed that there is no significant difference between both techniques neither in wound complication incidence nor in recurrence rates.

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