ORIGINAL ARTICLE

Repair of Strangulated Umbilical Hernia with or without Mesh

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Submit Date	**2020-09-15**
Revise Date	2020-10-20
Accept Date	2020-10-29

ABSTRACT

Background: The optimal technique to cure strangulated umbilical hernia remains controversial. The use of mesh in cases of strangulated hernia is still debated due to the potential risk of infection. This study aimed put a strategy for repairing of strangulated umbilical hernia with or without mesh.

Patients and Methods: This prospective comparative study was conducted on patients with strangulated hernia admitted to general surgery hospital Zagazig University during period from June 2018 to January 2019. This study included 30 patients with strangulated hernia, they were divided randomly into 2 groups, 15 patients underwent repair with mesh and 15 underwent repair without mesh. All patients were subjected to Demographic data taking, complete clinical examination. Laboratory investigations and Radiological investigations.

Results: Operative times and hospital stay were longer in Group A who underwent repair with mesh, the duration was 60-90 minutes versus 20% only in of group B repair without mesh. That mean of hospital stay among Group A is 4.8 ± 1.65 days, while in Group B mean of hospital stay is slightly shorter 4.2 ± 1.65 with no statistical difference. post-operative complications showed higher in Group A where pus formation and seroma formation were more statistically.

Conclusion: The repair of strangulated umbilical hernia with or without mesh are variable, However, these procedures are associated with poor prognoses and a higher rate of post-operative complications.

Keywords: Umbilical hernia, Strangulated, Hernias represent, Intestinal strangulation, Mesh

INTRODUCTION

The recurrence rates after tissue repair are variable, with reports ranging from 15 to 40 %, while the use of prosthetic material for open umbilical hernia repair has been reported to reduce the recurrence rates. Mesh repair, pre aponeurotic (onlay), retro muscular or pre peritoneal (sublay) and intra-abdominal (underlay) placement or even combinations have been described with acceptable results[1].

Incarcerated hernias represent about 10 % of operated umbilical hernias. In elective hernia surgery, tension-free mesh repair has been proven to be more effective than suture reconstruction in terms of long term recurrence .Wound infection rates vary between 1 and 7 % in both mesh and no-mesh repair [2].

The optimal technique to cure strangulated umbilical hernia remains controversial. The use of mesh in cases of strangulated hernia is still debated

due to the potential risk of infection[1]. There was a concept that any patient with complicated hernias, that is, acute incarceration and/or strangulation at an unacceptably high risk of recurrence. Although several studies have clearly demonstrated the safety and efficacy of prosthetic mesh repair in the emergency management of the acutely incarcerated and/or strangulated inguinal and ventral hernias, however, surgeons remained both skeptical and reluctant to use prosthetics in such settings[3].

The mesh related problems in strangulated umbilical hernia such as wound complications, discomfort, pain and a potential loss of flexibility of the abdominal wall raise the question whether all patients should have mesh repair or not [4].

Understanding of mesh prosthesis aids in decision-making. Macroporous lightweight polypropylene mesh is highly resistant to infection. If it becomes infected, these mesh prostheses can typically be

salvaged with local wound care and a short course of antibiotics. Polytetrafl uoroethylene (PTFE) or expanded PTFE (ePTFE) mesh prosthesis are very durable and will not adhere to viscera or other adjacent tissue. However, its lack of ingrowth prohibits mesh salvage if it becomes infected and antimicrobial therapy is not reasonably expected to sterilize the actual prosthesis because there is no blood flow within the mesh prosthesis. Therefore, PTFE or ePTFE has little or no place in emergent hernia repair, particularly in the contaminated wound [5]. In patients with intestinal strangulation and/or concurrent bowel resection, synthetic mesh repair should be performed with caution because of the risk of mesh infection [6]. This study aimed to put a strategy for repairing of strangulated umbilical hernia with or without mesh.

PATIENTS AND METHODS:

A Prospective, comparative study was conducted on patients with strangulated hernia admitted to general surgery hospital Zagazig University during period from June 2018 to January 2019. This study included 30 patients with strangulated hernia, they were divided randomly into 2 groups, 15 patients underwent repair with mesh and 15 underwent repair without mesh. Approval for performing the study was obtained from general surgery departments, Zagazig University Hospitals after taking approval of Institutional Review Board (IRB). the was carried out in accordance with The Code of Ethics of the World Medical Association. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Inclusion criteria: Patients more than 18 and less than 70 years old. Patients showing no signs of perforation or peritonitis. Patients with still healthy overlying covering skin. Patients fit for surgery.

Exclusion criteria: Patients below 18 and above 70 years old. Patients who had alterations or abnormality in blood clotting or immune system. Patients with history of long use of steroids. Patients with uncontrolled diabetes or advanced liver disease. Patients with collagen disease. Patients who refused to enter the study.

All patients were subjected to Demographic data taking, complete clinical examination. Local examination was done focusing on the umbilical hernia, colour of the skin overlying the hernia sac. Laboratory (Routine) investigations were done for all patients including complete blood count (CBC), Alanine Aminotransferase (ALT), Aspartate aminotransferase (AST), Urea, Creatinine, Random blood sugar, coagulation profile and serum albumin.

Radiological investigations such as superficial probe ultrasonography, pelvi- abdominal ultrasonography, and plain erect x ray abdomen and CT abdomen.

Methods :
The patients are simple random divided into two groups: according to coming to emergency department,the 1st case will be repaired with mesh while the 2nd case will repaired without mesh and so on.

Group A; This group included fifteen patients, resection and anastomosis and intra peritoneal drain then closure of the defect using prolene 1 then mesh repair, using polyproline mesh, (onlay technique),then fixation of the mesh with prolene 2/0. Closure of subcutaneous tissue and skin. Closed suction drain of 2 limbs was used. **Figure 1**

Group B; This group included also fifteen patients. In this group, was submitted to resection and anastomosis of the gangrenous loop of intestine, intraperitoneal drain was done, then closure of the defect using prolene then closure of subcutaneous tissue using vicryl then closure of skin with closed suction drain of 2 limbs.

Removal of the intra peritoneal drain after 5 days then close follow up to the suction drain daily and estimation of the serous fluid daily, then removal of the suction drain when the serous fluid reach about 30 cc or less and after 7 days post-operative.

Figure 2 Follow up:
The postoperative outcome was monitored during outpatient visits. The amount and nature of drained fluid were recorded daily. The drains were removed when the amount of fluid became less than 50 cc/24 hours, or when the drained fluid started to become infected disregarding the amount drained in the last days. Time of drain removal postoperatively was recorded in each case.

Complications:
Postoperative complications including seroma, peritonitis, and mesh rejection were recorded **Figure 3**. We used 3rd generation cephalosporin for therapy for infection, and wound dressing and debridement were used for necrosis. Wound dressing was standard in all groups **Figure 4**.

Statistical analysis :
The collected data were analyzed by computer using Statistical Package of Social Services version 24 (SPSS), Data were represented in tables and graphs, Continuous Quantitative variables e.g. age were expressed as the mean $\pm$ SD & median (range), and categorical qualitative variables were expressed as absolute frequencies (number) & relative frequencies (percentage). Suitable statistical tests of significance were used after checked for normality. The results were considered statistically significant when the significant

probability was less than 0.05 (P < 0.05). P-value < 0.001 was considered highly statistically significant (HS), and P-value ≥ 0.05 was considered statistically insignificant (NS).

RESULTS:

This study showed that age of patients with strangulated hernia repaired with mesh group is ranging from 18-60 years old with mean (54.6 ± 7.45) years old and 60% of them are female while age of patient in Group 2 group is (44.6 ± 11.16) years old, ranged from 18-60 years old, patients in Group A in repair with mesh group were statistically older than Group B repair without mesh. most of patients were female 9 female patients in group A (60%), while in group B 10 patients were female (66.7%). There was no significant difference between both groups regarding comorbidities where 26.7% of the studied Group A were obese and 20% of them were diabetics, while 40% of patients in the Group B were obese and diabetics. (most of patients were obese and non diabetic). **Table (1)**

This study showed that 33% of group A patients who underwent repair with mesh had gangrenous intestine versus only 20% of group B repair without mesh, regarding operation time, 46.6% of group A patients who underwent repair with mesh, the duration was 60-90 minutes versus 20% only in of group B repair without mesh. **Table (2)**

This study showed that there was high statistically significant difference between both groups where pus formation and seroma formation were more statistically higher in Group A. **Table (3)**

Table 1: Sociodemographic characteristics and Comorbidities among of the studied groups

Item	Group A (N=15)		Group B (N=15)		Test	P-value
	No.	%	No.	%		
Age groups						
18-30	3	20.0	1	6.7	Fisher exact	1.000 (NS)
31-60	12	80.0	14	93.3		
Sex						
Male	6	40.0%	5	33.3%	Fisher exact	1.000 (NS)
Female	9	60.0%	10	66.7%		
Obesity (BMI > 30)						
No	4	26.7	6	40.0	0.6	0.438 (NS)
yes	11	73.3	9	60.0		
Diabetes mellitus on ttt						
No	12	80.0	9	60.0	Fisher's	0.427 (NS)
yes	3	20.0	6	40.0		

* Mann Whitney U test.   P < 0.05 is significant.
Test: chi-square test significant.   NS: Not significant.

Table (2): Intraoperative data and Hospital stay among the studied groups

Item	Group A (N=14)		Group B (N=15)		Test	P-value
	No.	%	No.	%		
Gangrenous content						
Intestine	5	33.3	3	25.0	Fisher's exact	0.409 (NS)
Omentum	9	56.7	11	75.0		
Operation time						
30-60 min	5	33.3	10	66.7	15.45	0.000* (HS)
60-90 min	7	46.6	2	13.3		
> 90 min	2	20	3	20.0		
Hospital stay (days)	Group A (N=15)		Group B (N=15)		MWT	P-value
Mean ± SD	4.8 ± 1.65		4.2 ± 1.65		90.00	0.314 (NS)
Median (Range)	5 (3-7)		3 (3 – 7)			

Chi-square test/Fisher's exact test   NS: Not significant
HS: highly significant.   #Mann Whitney U test.
P < 0.05 is significant

Table (3): Post-operative complication among the studied groups.

Item	Group A (N=15)		Group B (N=15)		Test	P-value
	No.	%	No.	%		
Infection						
No	6	40.0	13	86.7	7.033	0.008* (S)
yes	9	60.0	2	13.3		
eroma formation						
No	3	20.0	11	73.3	8.571	0.003* (S)
yes	12	80.0	4	26.7		
Recurrence						
No	10	66.7	7	46.7	1.22	0.270 (NS)
yes	5	33.3	8	53.3		
Sinus						
No	6	40.0	13	86.7	7.033	0.008* (S)
yes	9	60.0	2	13.3		

Test: chi-square test

NS: Not significant

A

B

C

D
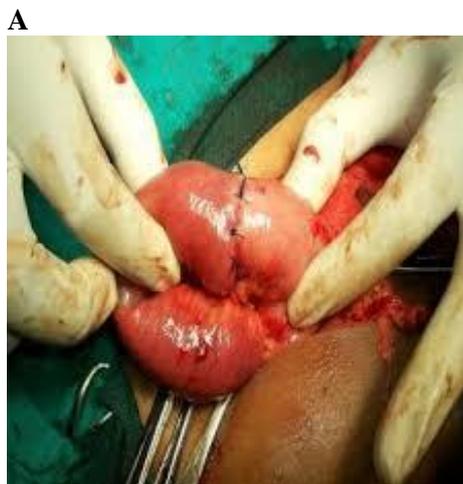
Figure 1: Strangulated umbilical hernia hernia repair without mesh was done.

A: Blackish discoloration of hernia sac denoting gangrenous contents

B: Gangrenous loop of small intestine (contents of the sac).

C: Resection, anastomosis was done.

D: Closure of the skin and fixation of the suction drain
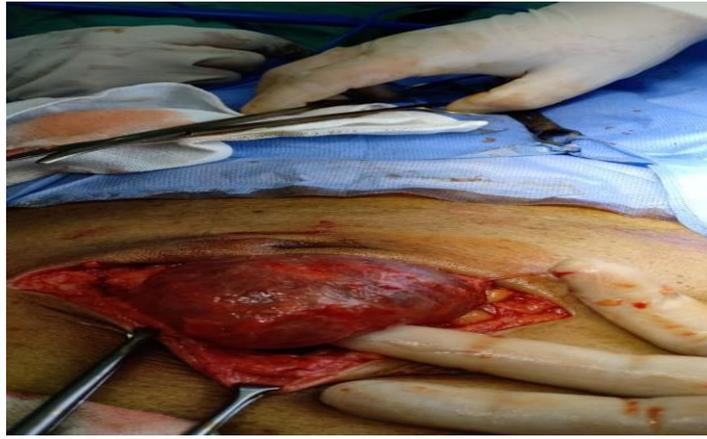
Figure 2: Strangulated umbilical hernia hernia repair without mesh was done

Figure 3: Mesh failure after repair of strangulated umbilical hernia in male patients 55 years old.

Figure 4: Surgical site infection after mesh repair of strangulated hernia in 35 years old male

DISCUSSION

In this study the results showed that age of patients with strangulated hernia repaired with mesh group A is ranging from 42-60 years old with mean 54.6 ± 7.45 years old and 60% of them are female while age of patient in Group B is 44.6 ± 11.16 years old, ranged from 18 -60 years old, patients in Group A in repair with mesh group were statistically older than Group B repair without mesh. In other study the total number of cases was 40 patients, about 25 cases (62.5%) their age was <65 years and about 15 patients (37.5%) their age was >65 years old [7]. In this study the results showed that there was no significant difference between both groups regarding comorbidities where 26.7% of the studied Group A were obese and 20% of them were diabetics, while 40% of patients in the Group B were obese and diabetics.

In other study the results showed that about 33.3% of the patients were obese and about 15.4% of them were diabetic in group A, while about 29% in group B were obese and about 19% of them were diabetic[8].

In this study the results show that 33% of group A patients who underwent repair with mesh had gangrenous content from intestine versus only 20% of group B repair without mesh, regarding operation time, in 40% of group A patients who underwent repair with mesh, the duration was more than 90 minutes versus 20% only in of group B repair without mesh.

In other study the results show that 35% of group A patients who underwent repair with mesh had gangrenous contents versus 25% of group B, regarding operation time in group A 45% of

patients was more than 90 minutes versus only 20% of group B [9].

In this study the results show that mean of hospital stay among Group A is 4.8 ± 1.65 days, with a range from (3-7) days. While in Group B mean of hospital stay is slightly shorter 4.2 ± 1.65 with no statistical difference.

In other study he results show that hospital stay among group A ranges from (3-6) days. While in group B ranges from (2-4) days [10].

In this study post-operative complications showed high statistically significant difference between both groups where pus formation and seroma formation were more statistically higher in Group A.

Infection occours in 60% in group A while in group B were about 13.3%. Seroma formation in group A about 80% while in group B were about 26.7%. Recurrence rate in group A were about 33.3% while in group B were about 53.3%. Sinus formation in group A were about 60% while in group B were about 13.3%.

In other study hematoma formation 3.8% in group A, 0.5% in group B, wound infection 6% in group A, 0.3% in group B, seroma formation 50% in group A, 18% in group B, recurrence rate 10% in group A, 1% in group B.

CONCLUSION:

The usage of mesh in repair of strangulated hernia variable according to general condition of the patient and the surgeon decision, the procedure of repair with mesh associated with poor prognosis and higher rate of post-operative complications than the repair without mesh. Therefor, we recommend mesh repair when theres good general condition of the patient and theres no need to resect part of small intestine. However it should be tried on a much wider scale to prove its validity.

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How to cite