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Comparative Study between H Shape Mesh Repair and Standard Tummy Tuck Procedure in Small Paraumblical Hernia with Diastasis of the Rectus Muscles

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Abstract

Assess results of small ventral hernia (UH, PUH) and diastasis recti repair during H shape mesh hernioplasty and Tummy Tuck "*abdominoplasty*" regarding operative duration, intraoperative blood loss, length of hospital stay, length time return to work and post-operative complications. The present prospective study included 60 patients with UH, PUH hernia and diastasis recti. A mean Age of 50.77 ± 9.504 years. 30 patients underwent H shape mesh hernioplasty Group 'A' and 30 underwent standard Tummy Tuck "*abdominoplasty*" Group 'B'. From 2019 to 2020. And the patients followed for 8_14 months. In group 'A' the main operative time 45.17 ± 3.592 min, main intraoperative blood loss 75ml, insert SC drain in 93% removed after mainly 1.2 day, main postoperative pain 2.9 ± 0.923, length of hospital stay 1.07 ± 0.365 days and main time till return to work 7.33 ± 1.373 days. Post-operative Complications included seroma formation (3.3%), hematoma (6.7%), wound infection (6.7%), recurrence (3.3%) to date and 100% of patient was satisfied. In group 'B' the main operative time 88.5 ± 8.823 min, main intraoperative blood loss 250 ml, insert SC drain in 100% removed after mainly 14.93 ± 2.42 day, main postoperative pain 5.4 ± 0.648, length of hospital stay 3.4 ± 1.221 days and main time till return to work 23.1 ± 3.872 days. Post-operative Complications included seroma formation (20%), hematoma (10%), wound infection (6.7%), recurrent hernia (3.3%) and divarication recurrence (10%) to date and 63% of patient was satisfied. H shape mesh repair technique was safe, easy, fast and early return to work and superior to tummy tuck technique in small PUH with diastasis recti repair at less operative (time, blood loss) and less Post-operative (pain, infection, hematoma, seroma, hospital stay and return to work).

Keywords: Mesh, Paraumblical, Hernia, Repair, Tummy Tuck, abdominoplasty, Diastasis.

1. Introduction

Umbilical hernia (UH) and paraumblical hernia (PUH) are ventral hernia that occurs in the region of the umbilicus or around the umbilicus . This has the global prevalence of 2%. UH accounts for 10% of abdominal hernia [1]. Diastasis recti or diastasis rectus abdominis muscle (DRAM) is a common condition that can manifest following abdominal surgery or labor. It is characterized by a widening the linea alba along the rectus abdominis muscles. The differentiating feature of diastasis recti in relation to a ventral incisional hernia is that there is no fascial defect with diastasis recti [2, 3]. Abdominoplasty commonly known as “tummy tuck” is a procedure intended for revision of excessive abdominal skin and fat as well as strengthening of abdominal wall [4, 5]. The proceed of insertion of H shape mesh consist of three main steps (a) repair to posterior rectus sheath separately (b) insertion H shape mesh beneath two recti muscle extend from linea alba in mid line and linea semilunaris (c) closer of anterior rectus sheath. This procedure could be performed through small incision with no or minimal dissection to skin, with shorter operation time, shorter patient hospital stay, faster patient recovery and earlier time return to work than the standard Tummy tuck procedure. Also it helps bodybuilders to preserve their abdominal six packs [6].

2. Patients and methods

The patients recruited from General surgery outpatient clinic or from emergency room in Benha University Hospital, Benha health insurance hospital. The present prospective study include a total of 60 patients PUH, UH and diastasis recti, 30 patients repaired by H shape mesh hernioplasty and 30 patients by standard Tummy tuck procedure then follow up is designed for 6 months' duration.

2.1 Inclusion criteria

Patient with UH, PUH with diastasis rectus abdominis muscle, males and females and above 18 years.

2.2 Exclusion criteria

Patient below 18 years**,** Moderate or severe abdominal skin redundant, refusing surgery or unfit for surgery.

Patient with huge, recurrent, strangulated or obstructed hernia, with major comorbid disease.

2.3 Surgical procedure

Group A: We will use (H) Shape mesh hernioplasty operative Technique. Transverse incision directly above hernia, the incision is deepened through the SC fat until the rectus sheath is seen then Dissect the neck of the sac from all directions by cleaning of fat of surrounding fascia, Open the sac at its neck, Free the contents & reduce it and Excise the sac, Anatomical repair to the Peritoneum & posterior rectus sheath in linea alba from above downwards through the incision including the defect of the hernial sac, Dissect between posterior rectus sheath posteriorly and rectus abdominis muscle anteriorly, xephi-sternum superiorly and pubic tubercle inferiorly and semilunaris line laterally in both side,

Insert H shape mesh through incision each limb in dissected space, Anatomical repair to anterior rectus sheath. Insert SC drain according to circumstances (optionally), Close scarab, subcutaneous and skin layer by layer, dressing.

Group B: We will use Tummy Tuck "abdominoplasty" operation technique. Traditional abdominoplasty.

3. Results

The present prospective study included 60 patients with UH, PUH hernia and diastasis recti. A mean Age of 50.77 ± 9.504 years. 30 patients underwent H shape mesh hernioplasty Group 'A' and 30 underwent standard Tummy Tuck "abdominoplasty" Group 'B' Table (1). From 2019 to 2020. And the patients followed for 8_14 months.

In group 'A' the main operative time 45.17 ± 3.592 min. Ranged between (40_50 min), main intraoperative blood loss 75ml (50_ 250 ml), insert SC drain in 93% removed after mainly 1.2 day (1_3 days), main postoperative pain 2.9 ± 0.923, length of hospital stays 1.07 ± 0.365 days (1_3 days) and main time till return to work 7.33 ± 1.373 days (7_14 days). Post-operative Complications included seroma formation (3.3%), hematoma (6.7%), wound infection (6.7%) and recurrence (3.3%) to date Table (2, 3, 4) and 100% of patient was satisfied Table (5).

In group 'B' the main operative time 88.5 ± 8.823 min Ranged between (75_115 min), main intraoperative blood loss 250 ml (200_ 500 ml), insert SC drain in 100% removed after mainly 14.93 ± 2.42 day (14_21 days), main postoperative pain 5.4 ± 0.648, length of hospital stays 3.4 ± 1.221 days (3_7 days) and main time till return to work 23.1 ± 3.872 days (21_30 days). Post-operative Complications included seroma formation (20%), hematoma (10%), wound infection (6.7%), recurrent hernia (3.3%) and divarication recurrence (10%) to date Table (2, 3, 4) and 63% of patient was satisfied Table (5).

Table (1) Demographic data.

Parameter	Groups		Test	
	H-Shape Mesh Repair group	Standard Tummy Tuck Procedure group	χ^2/t	p
	N=30 (%)	N=30 (%)		
Gender				
Female	20 (66.7)	22 (73.3)	0.317	0.573
Male	10 (33.3)	8 (26.7)		
Age (year)				
Mean ± SD	50.77 ± 9.504	48.23 ± 10.631	0.973	0.335
Range	28 – 67	28 – 66		

χ2 Chi square test t Independent sample t test

Table (2) Operative data.

Parameter	Groups		Test	
	H-Shape Mesh Repair group	Standard Tummy Tuck Procedure group	χ^2/t	p
	N=30 (%)	N=30 (%)		
Anesthesia				
General	7 (23.3)	19 (63.3)	9.774	0.002*
High spinal	23 (76.7)	11 (36.7)		
Sub muscular Drain				
No	27 (90)	30 (100)	Fisher	0.237
Yes	3 (10)	0 (0)		
SC drain				
No	2 (6.7)	0 (0)	Fisher	0.492
Yes	28 (93.3)	30 (100)		
Drain insertion (day)				
Mean ± SD	1.2 ± 0.61	14.93 ± 2.42	-7.314	<0.001**
Range	1 – 3	14 – 21		
Operative time (min)				
Mean ± SD	45.17 ± 3.592	88.5 ± 8.823	-24.915	<0.001**
Range	40 – 50	75 – 115		

Table (2) Continue

Intraoperative bleeding (mL)				
Median	75	250	-7.314	<0.001**
Range	50 – 250	200 – 500		

Table (3) Postoperative progress **.**

Parameter	**Groups**		**Test**	
	H-Shape Mesh Repair group	**Standard Tummy Tuck Procedure group**	**χ^2/t**	**p**
	N=30 (%)	**N=30 (%)**		
Postop pain				
Mean ± SD	2.9 ± 0.923	5.4 ± 0.648	-12.419	<0.001**
Range	3 – 7	7 – 9		
Hospital stay (days)				
Mean ± SD				
Range	1.07 ± 0.365	3.4 ± 1.221	-10.032	<0.001**
	1 – 3	3 – 7		
Time to return to work (days)				
Mean ± SD	7.33 ± 1.373	23.1 ± 3.872	-21.022	<0.001**
Range	7 – 14	21 – 30		

Table (4) postoperative complications.

Parameter	**Groups**		**Test**	
	H-Shape Mesh Repair group	**Standard Tummy Tuck Procedure group**	**χ^2/t**	**p**
	N=30 (%)	**N=30 (%)**		
Seroma				
No	29 (96.7)	24 (80)	Fisher	0.103
Yes	1 (3.3)	6 (20)		
Hematoma				
No	28 (93.3)	27 (90)	Fisher	>0.999
Yes	2 (6.7)	3 (10)		
Infection				
No	28 (93.3)	28 (93.3)	Fisher	>0.999
Yes	2 (6.7)	2 (6.7)		
recurrent hernia				
No	29 (96.7)	30 (100)	Fisher	>0.999
Yes	1 (3.3)	0 (0)		
divarication recurrence				
No	29 (96.7)	27 (90)	Fisher	0.492
Yes	1 (3.3)	3 (10)		

Table (5) Patient satisfaction.

Parameter	**Groups**		**Test**	
	H-Shape Mesh Repair group	**Standard Tummy Tuck Procedure group**	**χ^2/t**	**p**
	N=30 (%)	**N=30 (%)**		
Patient satisfaction: Unsatisfied				
Satisfied	0 (0)	11 (36.7)	Fisher	<0.001**
	30 (100)	19 (63.3)		

4. Discussion

In this prospective study, we conducted in General Surgery department of Benha University Hospital and

Benha health insurance hospital on 60 patients with small UH/PUH with diastasis recti divided by Simple random allocation method into two group, 30 patients treated by H shape mesh hernioplasty (group A) and 30 patients treated by Tummy Tuck abdominoplasty (group B).

Main age of (group A) was 50.77 years and (group B) was 48.23 years agree with 5 studies (Sallam, et al [7] study, Elgohary, et al [8] study, Arunagiri, et al [9] study, Novitsky, et al [10] study and Cheesborough, et

al [11] study). Disagree with 5 studies (Baig, et al [12] study, Nockolds, et al [13] study, Ko¨hler, et al [14] study, Petersson et al [15] study and Wiessner, et al [16] study).

Among gender of (group A) was 20 (66.7%) female and (group B) was 22 (73.3%) female as high female percentage agree with 7 studies (Cheesborough, et al [11] study, Sallam et al[7] study, Arunagiri, et al [9] study, Elgohary, et al [8] study, Baig, et al [12] study, Novitsky, et al [10] study and Petersson et al [15] study). Disagree with 3 studies (Nockolds, et al [13], Wiessner, et al [16] study and Ko¨hler, et al [14] study).

The main operative time reported with (group A) was (45.17 min) agree with (Arunagiri, et al [9] study and Elgohary, et al [8] study). Disagree with 4 studies (Ko¨hler, et al [14] study, Sallam, et al [7] study, Elgohary, et al [8] study and Chung, et al [17] study).

Main operative time reported with (group B) was (88.5 min) disagree with Cheesborough, et al [11] study).

Main intraoperative blood loss reported in (group A) was (75 ml) and (group B) was (250 ml) that agree with Novitsky, et al [10] study).

SC drain insertion reported with (group A) was 28 (93.3%) of patients and removed after mainly 1.2 days with no SSO or SSI in undrained patients. Agree with Arunagiri, et al [9] study. Disagree with 4 studies (Sallam, et al [7] study, Elgohary et al [125] study, Petersson et al [15] study and Baig SJ, et al [12] study).

SC drain insertion reported with (group B) was 100% and removed mainly 14.93 days. Agree with Nockolds, et al [13] study, Disagree with Petersson et al [15] study.

Median first day postoperative pain on VAS in (group A) was 2.9 in. Agree with Shaukat, et al [18] study.

Median first day postoperative pain on VAS in (group B) was 5.4.

Median length hospital stay reported with (group A) was 1.07 days agree with Arunagiri, et al [9] study and Chung, et al [17] study. Disagree with 5 studies (Ko¨hler, et al [14] study, Sallam, et al [7] study, Novitsky, et al [10] study, Arunagiri, et al [9] study and Petersson et al [15] study).

The median length hospital stay reported with (group B) was 3.4 days.

There is no enough study in ventral (UH, PUH) to compare time till return to work but there is only two study in ventral hernia (inguinal hernia).

The median time till returns to work reported (group A) was 7.33 days agree with Kumar et al [19] study, Disagree with Liem et al [20] study.

The median time till returns to work reported (group B) was 23.1 days.

Postoperative complication in (group A) was one (3.3%) patient presented with seroma, 2 (6.7%) patients presented with hematoma, 2 (6.7%) patients presented with infection, one (3.3%) patient presented with recurrence agree with (Sallam, et al [7] study with subrectal mesh hernioplasty, Elgohary, et al [8] study with mini CST and I Chung, et al [17] study with open simple suture repair).

Disagree with (Elgohary, et al [8] study with onlay mesh repair, Petersson, et al [15] study with Modified peritoneal flap hernioplasty technique with Retromuscular mesh technique).

Postoperative complication in (group B) was 6 (20%) patients presented with seroma, 3 (10%) patients presented with hematoma, 2 (6.7%) patients presented with infection, one (3.3%) patient presented with recurrent hernia and 3 (10%) patient presented with recurrent divarication recti agree with (Novitsky, et al [10] study with TAR during complex abdominal wall reconstruction and Cheesborough, et al [11] study with abdominoplasty.

Disagree with Nockolds, et al [13] study with abdominal wall reconstruction with components separation and mesh reinforcement).

Patient early postoperative satisfaction was 100% with (group A) agreed with Wiessner, et al [16] study and Petersson et al [15] study). Disagree with Petersson et al [15] study).

Patient early postoperative satisfaction was 63.3% with (group B) most probably duo to compare themselves by (group A) early result (pain, movement, drain, hospital stay) disagree with Swapnil Kachare et al [21] study).

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