PARA UMBILICAL HERNIAS;
COMPARATIVE EFFECTIVENESS OF MESH VERSUS MAYO'S REPAIR

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ABSTRACT… Background: Para-umbilical hernias are the common hernias among ventral abdominal hernias constituting about 85% of the overall abdominal wall hernias. Due to their high risk of complications, adult paraumbilical hernias needs surgical repair. **Objectives:** To compare effectiveness of mesh versus mayo's repair of para umbilical hernias in terms of post-operative pain. **Study Design:** Randomized controlled trial. **Setting:** Surgical Department, Hayatabad Medical Complex, Peshawar. **Period:** 12 months. **Materials and Methods:** A total of 162 patients with paraumblical hernia were repaired. They were equally divided into 2 groups with mesh repair (group A) and Mayo's repair (Group B). The intervention effectiveness of mesh versus mayo's repair of para umbilical hernias was measured in terms of post-operative pain by Visual Analogue Scale at the end of 3rd month. Data was analyzed by using SPSS version 17. Chi Square Test was used p Value $\leq$ 0.05 was significant. All the results were presented in the form of tables and charts. **Results:** Mean age in (Mesh repair) was 30 years $\pm$ 2.1SD whereas mean age in (Mayos repair) was 28 years $\pm$ 1.71SD. In Group A (Mesh repair), 73(90%) patients had mild pain (VAS 0-3), 8(10%) patients had moderate pain (VAS 4-6). In Group B (Mayos repair), 63(78%) patients had mild pain (VAS 0-3), 16(20%) patients had moderate pain score (VAS 4-6), 2(2%) patients had severe pain score (VAS 7-10). Mesh repair was effective in 73(90%) patients whereas Mayos repair was effective in 63 (78%) patients. **Conclusion:** Mesh repair is more effective in terms of post-operative pain than Mayos repair.

Key words: Para Umbilical Hernias; Mesh Repair; Mayo's Repair; Post-Operative Pain.

INTRODUCTION

Para-umbilical hernias are the common hernias among anterior abdominal wall hernias and constitute about 85% of the overall ventral abdominal wall hernias. The para-umbilical hernia occurs through a defect in the linea Alba or through a weakened umbilical scar.[1]

The most common symptom of paraumbilical hernias which is experienced by 44% patient is the pain at the umbilicus, followed by pressure in 20%, nausea and vomiting in 9% of patients.[2] compared to other abdominal hernias, complications such as irreducibility, obstruction, strangulation, skin ulceration, and rupture are more common in paraumbilical hernias,.[3]

Paraumbilical hernias are typically diagnosed with a detailed history and physical examination.

Patients generally complain of pain and/or a lump at the umbilicus. On physical examination, a protrusion at the umbilicus can be seen. As compared to inguinal hernias, Paraumbilical hernias are more common in women than in men.[4] Indication for surgical repair of inguinal hernia is that persist beyond 5 years of age or hernia defects larger than 2 cm.[8] Regarding postoperative complications, a nationwide prospective study of umbilical and epigastric hernias has reported that complications requiring readmission are hematoma (46% of cases), seroma (19%), and pain (77%).[9] In this study it was also reported that para-umbilical hernia was the commonest of ventral hernia (49.8%) followed by incisional hernia (24%). Postoperative complications were post-operative mild to moderate pain (13.8%), abdominal pain (3%) and foreign body sensation in the long run.[10] Post-operative infection has been

reported in Mayo's repair is 11.11% and in Mesh repair has been reported as 6.22%. however the recurrence is more in mayo's repair (9.37%) as compared to mesh repair cases(2.71%).[11]

After all the disagreements regarding the best possible way of repairing the para-umbilical hernias through mesh and mayos repair procedures, especially to reduce the recurrence of hernia and other complications, still more studies are needed around the world to finalize the best method in this regard. As there is also discrepancy in the results of previous nationwide studies regarding post-operative pain in paraumbilical hernias, this study is planned in our own setting to compare the effectiveness of mesh versus mayos repair in paraumbilical hernias in terms of post-operative pain. If the results of this study are found to be favorable and considerable, then these results will be shared with other general surgeons and we will recommend that method as routine procedure for all cases of para-umbilical hernia repair.

MATERIAL AND METHOD

This randomized controlled trial was conducted at Surgical Department, Hayat Abad Medical Complex Hospital, Peshawar during 12 months from 24/1/2016 to 24/1/2017 comprising of 81 patients in each group. All the patient of either gender between 18 to 60 years of uncomplicated para umbilical hernia, having linea alba defect more than 2 cm were included in the study. All patients having previous recurrence, Obesity (BMI of 30 are above), Diabetes mellitus, patients on anticoagulant and steroid therapy as well as with debilitating diseases like chronic liver, renal, cardiac disease were excluded from this study.

The study was conducted after getting approval from hospital ethical and research committee. The patients meeting the inclusion criteria was included in the study through OPD/ER Department. The diagnosis of para-umbilical hernia was based upon patient having a visible bulge in supraumbilical region while he/she strains in standing position on naked eye examination. The purpose, risks and benefits of the study was explained to all included patients, they were assured that the study is purely conducted for research and data publication and a written informed consent was obtained from all included patients.

The patients were randomly allocated in two groups by lottery method. Patients in group A were subjected to undergo open mesh repair (Group A) and patients in group B were subjected to undergo classical Mayo's repair (Group B) for para-umbilical hernia. Complete history was taken from all patients followed by complete physical examination and routine pre-operative baseline investigations. All the patients were put on OT list for the next OT day and the respective repair procedures (Mesh repair for group A and Mayo's repair for group B) were applied to patients of relevant group under thesupervision of single expert general surgeon fellow of CPSP.

Post operatively all patients were kept under observations for 2-4 days in ward and was discharged if indicated. Postoperatively all patients were followed at regular intervals and finally at the end of 3rd month to determine pain in the para-umbilical region to determine the effectiveness of both the procedures. Pain was assessed by Visual Analogue Scale (VAS) as: Grade 0: No pain (VAS), Grade 1: Mild = 1 − 3 (VAS), Grade 2: Moderate = 4 − 7 (VAS), Grade 3: Severe = 8 − 10 (VAS). Mild, moderate and severe pain was considered significant. Effectiveness was considered positive if zero to mild pain achieved after 3 months.

All the above mentioned information including name, age, gender, address and contacts was recorded on a pre-designed proforma (ANNEX-I). Exclusion criteria had strictly followed to control confounders and bias in the study results.

Data was analyzed by using SPSS version 17 on computer. Mean ± Standard Deviation were computed for numerical variables like age and duration of hernia. Frequency and percentages were computed for categorical variables like gender, pain. Pain was stratified among age, gender, duration to control effect modifier.

RESULTS

This study was conducted at Surgical Department Hayat Abad Medical Complex Hospital, Peshawar. In which a total of 162 patients (81 in each group) were observed to compare effectiveness of mesh versus mayo's repair of para umbilical hernias in terms of post-operative pain and the results were analyzed as:

The mean age in (Mesh repair) was 30 years ± 2.1SD whereas mean age in (Mayos repair) was 28 years ± 1.71SD. Age distribution among two groups were analyzed as in Group A (Mesh repair), 8(10%) patients were < 20 years, 18(22%) patients were in age range 21-30 years, 31(38%) were in age range 31-40 years, 24(30%) were in age range 41-50 years. Mean age was 30 years with standard deviation ± 2.16. In Group B (Mayos repair), 10(12%) patients were < 20 years, 19(23%) patients were in age range 21-30 years, 28(35%) were in age range 31-40 years, 24(30%) were in age range 41-50 years. Chi Square test was applied in which P value was 0.9398.

Gender distribution among two groups were analyzed as in Group A (Mesh repair), 23(28%) patients were male and 58(72%) patients were female. In Group B (Mayos repair), 20(25%) patients were male and 61(75%) patients were female. Chi Square test was applied in which P value was 0.5934.

Duration of hernia among two groups were analyzed as in Group A (Mesh repair), 45(56%) patients had hernia < 3 years while 36(44%) patients had hernia >3 years. In Group B (Mayos repair), 43(53%) patients had hernia < 3 years while 38(47%) patients had hernia >3 years.

Status of pain among two groups were analyzed as in Group A (Mesh repair), 73(90%) patients had mild pain score (VAS 0-3), 8(10%) patients had moderate pain score (VAS 4-6). Mean pain was 2 with standard deviation ± 1.78. In Group B (Mayos repair), 63(78%) patients had mild pain score (VAS 0-3), 16(20%) patients had moderate pain score (VAS 4-6), 2(2%) patients had severe pain score (VAS 7-10). Mean pain was 4 with standard deviation ± 2.01. Chi Square test was applied in which P value was 0.0671. (Table-I)

Efficacy among two groups was analyzed as Mesh repair was effective in 73(90%) patients and was not effective in 8(10%) patients. Whereas Mayo's repair was effective in 63(78%) patients and was not effective in 18(22%) patients. Chi Square test was applied in which P value was 0.03232. (Table-II)

Stratification of efficacy with age, gender and duration of hernia is given in Table-III, IV.

Pain	Group A	Group B	P Value
0 - 3 (mild pain)	73(90%)	63(78%)	
4-6 (Moderate pain)	8(10%)	16(20%)	
7 – 10 (Severe pain)	0	2(2%)	0.0671
Total	81(100%)	81(100%)	
Mean and SD	2 ± 1.78	4 ± 2.01	

Table-I. Status of pain of mesh repair (group a) versus mayo's repair (group b) of para umbilical hernias using visual analogue score (n=162)

Efficacy	Group A	Group B	P Value
Effective	73(90%)	63(78%)	
Not effective	8(10%)	18(22%)	0.03232
Total	81(100%)	81(100%)	

Table-II. Efficacy of mesh repair (group a) versus mayo's repair (group b) of para umbilical hernias (n=162)

Age	Mesh Repair	Mayos Repair	P Value
< 20 years	8 (9.87%)	10 (12.34%)	0.000
21-30 years	16 (19.75%)	15 (18.51%)	0.4122
31-40 years	28 (34.56%)	22 (27.16%)	0.2099
41-50 years	21 (25.92%)	16 (19.75%)	0.0859

Table-III. Stratification of efficacy of mesh repair (group a) versus mayo's repair (group b) of para umbilical hernias according to age (n=162)

Gender	Mesh Repair	Mayos Repair	P Value
Male	20 (24.70%)	12 (14.81%)	0.0433
Female	53 (65.43%)	51 (62.96%)	0.2016

Table-IV. Stratification of efficacy of mesh repair (group a) versus mayo's repair (group b) of para umbilical hernias according to according to gender (n=162)

DISCUSSION

Para-umbilical hernias comprise of 85% of the overall ventral abdominal hernias. It occurs as a

result of a defect in the linea Alba or weakened umbilical scar.[1] The surgical repair of umbilical hernia is advised as it has a tendency to be associated with high morbidity and mortality in comparison with inguinal hernia because paraumbilical hernia has increased risk of incarceration and strangulation that require an emergency repair.[18]

Our study showed that mean age in (Mesh repair) was 30 years with standard deviation ± 2.16where as mean age in (Mayos repair) was 28 years with standard deviation ± 1.71. In Group A (Mesh repair), (28%) patients were male and (72%) patients were female where as in Group B (Mayos repair), (25%) patients were male and (75%) patients were female. In Group A (Mesh repair), (90%) patients had mild pain score (VAS 0-3), (10%) patients had moderate pain score (VAS 4-6). In Group B (Mayos repair), (78%) patients had mild pain score (VAS 0-3), (20%) patients had moderate pain score (VAS 4-6), (2%) patients had severe pain score (VAS 7-10). Mesh repair was effective in (90%) patients whereas Mayos repair was effective in in (78%) patients.

Similar results have been reported by Malik AM, et al[12] in which the total number of 101 patients were repaired by suture technique. Post-operative mild to moderate pain was noted in 13.8% patients whereas abdominal pain and foreign body sensations were less frequent in mesh repair patient in the long run i.e. 3%. Wound Infection was noted in 11 patients for mesh repair and in 7 patients for mayos repair. Similar results were observed in another study conducted by Daudpoto AQ[13] in which all cases of both group A&B were operated in general anesthesia. Operative time was longer in patients with mesh repair i.e. 61-80 minutes as compared to Mayo's repair i.e. 45- 60 minutes but hospital stay was longer in Mayo repair patients (5.5 day) as Compared to Mesh repair (4.5 days). In Mesh repair patients, A wound infection occurred 11.11% and in Mayo's repair it was 6.22%. Haematoma and seroma was 5.5% and 3.1% in Mesh repair and Mayo's repair respectively.

In our study, Mayo's suture repair took shorter operative time of 45-60 minutes in 68.7% and 61-80 minutes in 31.4% and in mesh repair slight lengthy procedure time was noted as 45-60 minutes in 44.45% and in 55.55% cases it was 61-80 minutes. Most of studies have shown that mesh repair is lengthy procedure. In our study, post-operative complications like wound infection were in 11.11% in mesh repair and 6.2% in mayo's repair, which were treated conservatively with antibiotics according to culture and sensitivity reports. Hematoma and seroma was observed high in Mesh repair (5.5% and 2.7%) and low in Mayo's repair (0.00%-3.1%). Complication rates were higher in Mesh repair as compared to mayo repair patients but all were managed conservatively with good outcomes. The success of conservative treatment has been reported in other studies as well.[8,14,15]

On the other hand, Paajanen H et al[16] have reported that the suture repair resulted in a long continued abdominal pain/discomfort in 13.86% patients and in 2.96% in the mesh repair patients.

Similarly in a study by Mazin Het al[17], the median operation time in mesh and Mayo's group ranged from 35-50 minutesand30-55minutes respectively but it was not significant. The postoperative stay was longer in Mayo' group as compared to Mesh group i.e. 12-48 hours and 12-24 hours respectively. Majority of patients in both groups fell into mild to moderate range, and postoperatively, there was nosignificant difference in mean pain scores between the two groups. The postoperative rehabilitation time difference was insignificant in Mesh repair patients (8-15 days) and in Mayo's repair (15-25 days). The early postoperative complications such as seroma, haematoma or wound infection in both groups were also insignificant statistically.

CONCLUSION
Our study concludes that mesh repair is a better and safe option and more effective in terms of post-operative pain than Mayo's repair.
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REFERENCES
1. Beauchamp MT, Evers M. Hernias. Malangoni MA,

Gagliardi RJ. **Sabiston textbook of surgery. 17ᵗʰ ed. Saunders publishers: Philadelphia.** 2004. p.1199-218.

2. Morris PJ. **Hernias of the Abdominal Wall.** Cobb R, McWhinnie DL, Michie HR, Berry AR, Hands LJ, Savage A et al. Oxford Text Book of Surgery, Vol I.1ˢᵗ Ed. New York: Oxford University Press. 1994. p.1397-417.

3. Kong V, Parkinson F, Barasa J, Ranjan P. **Strangulated paraumbilical hernia—an unusual complication of a Meckel's diverticulum.** Int J Surg Case Rep. 2012; 3(6):197–8.]

4. Dabbas N, Adams K, Pearson K, Royle GT. **Frequency of abdominal wall hernias: is classical teaching out of date?** JRSM Short Rep 2011 Jan; 2(1):5.

5. Bedewi MA, El-Sharkawy MS, Al Boukai AA, Al-NakshabandiN. **Prevalence of adult paraumbilical hernia. Assessment by high-resolution sonography: a hospital-based study.** Hernia. 2012 Feb; 16(1):59-62.

6. Kulaçoğlu H. **Current options in umbilical hernia repair in adult patients.** UlusCerrahiDerg 2015; 31(3):157–161.

7. Yanagisawa S, Kato M, Oshio T, MorikawaY. **Reappraisal of adhesive strapping as treatment for infantile umbilical hernia.** Pediatr Int. 2016 May; 58(5):363-8.

8. Schwartz SI, Shires, Spencer, Daly, Fischer, Galloway, et al. **Abdominal Wall Hernias. Wantz GE. Principles of Surgery.** Vol II.7ᵗʰ ed. McGrawHill: New York. 1999. p.1585-611.

9. Lawrence PF, Bell RM, Dayton MT, Ahmed MI. **Abdominal Wall Including Hernia. Essentials of General Surgery. 4ᵗʰ Ed. Lippincott Williams &Wilkins: Baltimore.** 2005. p.224-38.

10. Cuschieri A, Steele RJC, Moossa AR. **Disorders of The Abdominal Wall and Peritoneal Cavity. Essential Surgical Practice. 4th Ed. New York: Arnold Publications.** 2002. p.143-82.

11. Williams NS, Bulstrode CJK, Connell PR. **Hernias, Umbilicus and Abdominal Wall. Bailey& Love, Short Practice of Surgery.** 25ᵗʰ ed. Arnold: London. 2008. p.968-90.

12. Malik AM, Jawaid A, Talpur AH, Laghari AA, Khan A. **Mesh versus non-mesh repair of ventral abdominal hernias.** J Ayub Med Coll Abbottabad. 2008 Jul-Sep; 20(3):54-6.

13. Daudpoto AQ, Mirani S, Memon RA, Abbas Q. **A long term follow up: mesh versus mayo' s repair in para umbilical hernia.** JUMDC 2013; 4(1):12-6.

14. Bringman S, ramel S, Nyberg B, **Introduction of herniorrhaphy.** Eur j Surg; 2000; 166:310–312.

15. Snjay P, reid TD, davies EL, Arumugam PJ, woodward A. **Retrospective comparison of mesh and sutured repair for adult umbilical hernias.** Hernia, 2005; 9(3):248:51.

16. Paajanen H, HermunenH. **Long term pain and recurrence after repair of ventral incisional hernias by open mesh: clinical and MRI study.** Langenbecks Arch Surg 2004; 389:366–70.

17. Mazin H. Al-Hawaz. **Umbrella mesh versus mayo's repair in primary umbilical hernia.** Bas J Surg, 2002; 175-178.

18. Kulaçoğlu H. **Current options in umbilical hernia repair in adult patients.** UlusCerrahiDerg 2015; 31(3):157–61.

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