International Surgery Journal
Panguluri ASNM et al. Int Surg J. 2023 Jan;10(1):110-113
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20223601

Original Research Article

A comparative study of on-lay and preperitoneal mesh repair in the management of umbilical hernia

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Received: 25 November 2022
Revised: 16 December 2022
Accepted: 17 December 2022

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ABSTRACT

Background: Umbilical hernias can cause distress to the patients not only because of their complications but also because of the cosmetic angle, therefore this study was undertaken mainly to study the outcomes of preperitoneal mesh repair and on-lay mesh repair in the management of umbilical hernias.
Methods: The present study was a prospective, observational and comparative study undertaken in the department of general surgery, who had been operated in Kamineni hospital LB Nagar, Hyderabad, Telangana, during a study period from November-2020 to September-2021.
Results: Of 30 patients who underwent on-lay mesh repair, the mean hospital stay was 3.83±1.8 days; wound infection, seroma, hematoma, flap necrosis was seen in 1, 4, 2, 1 respectively and with no recurrence in 6 months follow-up. Of 30 patients who underwent pre-peritoneal mesh repair, the mean hospital stay was 2.13±0.63 days; Wound infection, seroma, hematoma, flap necrosis was seen in 0, 2, 1, 0 respectively and with no recurrence in 6 months follow-up.
Conclusions: On-lay mesh repair can be replaced with preperitoneal mesh repair. Overall mesh related complications, including wound infection, seroma, hematoma, flap necrosis is quite rare. Less Hospital stay and low recurrence rate was observed in preperitoneal method. As wound complication increases risk of recurrence, procedures that do not result in formation of de-vascularizing flaps may be recommended.

Keywords: Hernia, Mesh, On-lay, Pre-peritoneal, Repair, Umbilical

INTRODUCTION

A protrusion of viscus or part of viscus through the umbilical cicatrix is known as umbilical hernia. In embryo, the umbilical ring is the exit, entrance of the umbilical vessels and the entrance for the urachus. Round ligament of liver i.e., the obliterated umbilical vein and umbilical fascia i.e., the thickened transversalis fascia offer support to the umbilical area. Herniation occurs either due to the bifurcation of round ligament or if the umbilical fascia is absent or if it partially covers the umbilical ring.

Paraumbilical hernias generally are acquired lesions. According to Mayo's theory: obesity creates downward tension on the abdominal wall bearing on a fixed point on the umbilicus, resulting in an increase in the vertical dimension of the abdominal wall. Fat penetrates muscle bundles and layers, weakening the aponeurosis and promoting hernia formation.

If the hernia enlarges, symptoms or incarceration develops, surgical treatment should be considered.[1]

Prevalence in the adults is 2% and is much more common in cirrhotic and obese middle-aged multiparous women.[2]

In adults and older patients' obstruction and strangulation of umbilical hernia are common. These patients are usually obese, diabetic, patients with COPD. As a result, the urgency of repairing an umbilical hernia in adults is significantly greater than in infants.[3]

Small defects are closed primarily and defects >3 cm are closed using prosthetic mesh. Either preperitoneal mesh reinforced with suture repair and placing it laparoscopically or extraperitoneal placement of polypropylene mesh which has been successful. In order to achieve a permanent cure, a variety of surgeries are being used in its management.[4]

This study aimed to evaluate the outcomes of preperitoneal and on-lay mesh repair in the management of umbilical hernias. i.e., to ascertain the duration of post-operative stay, to observe post-operative complications like wound infection, seroma, hematoma, and flap-necrosis and to know the early recurrence in a 6 months follow-up.

METHODS

This was a prospective observational and comparative study on patients with clinical diagnosis of umbilical hernia who were admitted in Kamineni Academy of Medical Sciences and Research Centre, LB Nagar, Hyderabad during a period of 1 year i.e., from November 2020 to October 2021. Patients who underwent both on-lay and preperitoneal mesh repair were included.

Study sample

A total of 60 cases were included in the study.

Sample size was calculated by using the single proportion formula: $N = Z^2 p(1-p)/d^2$, where,

n = sample size

Z^2 = confidence interval

p = estimated prevalence of proportion (1.96)

d = desired precision (5%, d = 0.05)

Inclusion criteria

All patients admitted with umbilical hernias; age: 12 to 70 years; both genders; all uncomplicated umbilical hernias.

Exclusion Criteria

All complicated hernias***;*** ***r***ecurrent hernias; patients less than 12 years of age; patients medically not fit for surgery; patients who lost in the follow up.

Statistical methods

Data was analysed using SPSS v28. Categorical data was represented as frequencies and percentages. Continuous data was represented as mean and standard deviation. Bar charts and pie charts were used for pictorial representation of data wherever suitable.

Methodology

The study included 60 patients who were clinically diagnosed as having umbilical hernia.

Institutional ethics committee approval was obtained before commencing the study and prior informed written consent was obtained from the patients before enrolling them in the study.

A pre-structured proforma was used to record history details, including the duration of the symptoms, surgical history, preoperative USG Abdomen and/or CECT Abdomen. A thorough physical examination was done. 60 patients were randomly allocated into two groups. 30 patients underwent On-lay and 30 patients underwent Preperitoneal mesh repair.

RESULTS

Age distribution

In the present study most of the patients were in the age group of 31-40 years. Mean age was 41.4+11.94 years.

Table 1: Age distribution of patients (n=30).

Age (years)	Onlay repair N (%)	Preperitoneal repair N (%)
21-30	4 (13.3)	4 (13.3)
31-40	11 (36.7)	17 (56.7)
41-50	4 (13.3)	6 (20)
51-60	7 (23.3)	2 (6.7)
61-70	4 (13.3)	1 (3.3)

Gender distribution

In the present study there is male predominance with male: female ratio of 1.14:1, with males being 53.3% and females being 46.7%.

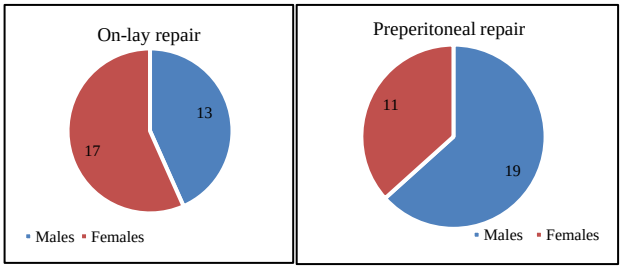

Figure 1: Pie diagram depicting gender distribution

Postoperative complications

Wound infection: In the present study it was seen in 1 (1.66%) patient. It was seen in 1 (3.3%) case in on-lay mesh repair group when compared to zero cases in preperitoneal mesh repair group.

Seroma: In the present study it was seen in 6 (10%) patients. It was seen in 4 (13.3%) cases in on-lay mesh repair group when compared to 2 (6.7%) cases in preperitoneal mesh repair group.

Hematoma: In the present study it was seen in 3 (5%) patients. It was seen in 2 (6.7%) cases in on-lay mesh repair group when compared to 1 (3.3%) case in preperitoneal mesh repair group.

Flap necrosis: In the present study it was seen in 1 (1.66%) patient. It was seen in 1 (3.3%) case in on-lay mesh repair group when compared to zero cases in preperitoneal mesh repair group.

At 6-month follow up, no recurrence was observed in both the study groups.

Table 2: Distribution of post-op complications.

Postop complication	On-lay repair	Preperitoneal repair
Wound Infection	1 (3.3%)	0
Seroma	4 (13.3%)	2 (6.7%)
Hematoma	2 (6.7%)	1 (3.3%)
Flap necrosis	1 (3.3%)	0
6-month recurrence	0	0

Average length of hospital stay

In the present study mean length of stay was 2.98±1.58 days. The length of stay was less in preperitoneal mesh repair group as compared to on-lay mesh repair group.

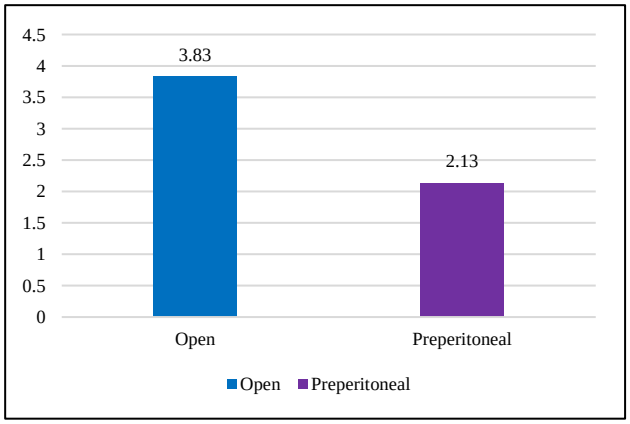

Figure 2: Bar diagram depicting length of hospital stay.

DISCUSSION

Age distribution

In the present study most of the patients belong to 31-40 years age group, mean age was 41.4±11.94 years. Similar age distribution was noted in studies done by Kulacoglu et al, and Purushotham et al which was 41 and 40 years respectively.[5,6]

Gender distribution

In the present study there is male predominance with male: female ratio of 1.14:1, with males being 53.3% and females being 46.7%. Similar distribution was noted in studies done by Jaawale et al and Ali et al.[7,8]

Postoperative complications

Wound infection

In the present study it was seen in 1 (1.66%) patient. It was seen in 1 (3.3%) case in on-lay mesh repair group when compared to zero cases in preperitoneal mesh repair group, it correlates with the studies done by Jawale et al and Bessa et al which had 3 (4.8%) patients and 1 (2.33%) patient with wound infections.[7,9]

Seroma

In the present study it was seen in 6 (10%) patients. It was seen in 4 (13.3%) cases in on-lay mesh repair group when compared to 2 (6.7%) cases in preperitoneal mesh repair group, it correlates with the studies done by Jawale et al, Bessa et al, Mustafa et al and Millas et al.[7,9,10,11]

Hematoma

In the present study it was seen in 3 (5%) patients. It was seen in 2 (6.7%) cases in on-lay mesh repair group when compared to 1 (3.3%) case in preperitoneal mesh repair group, it correlates with the study done by Jawale et al [(7)] and Narkhede et al.[7,12]

Flap necrosis

In the present study it was seen in 1 (1.66%) patient. It was seen in 1 (3.3%) case in on-lay mesh repair group when compared to zero cases in preperitoneal mesh repair group. This type of comparison was not documented previously by any other authors.

At 6-month follow up, no recurrence was observed in both the study groups. It correlates with that of Kulacoglu et al study.[5]

The present study has the following observed limitations. The study was done by a single surgeon hence the analysis is not likely to be universal. The study group was small to get a truly universally acceptable conclusion.

The work was totally based on a single strategy without taking many other confounding factors in to cognizance. The follow up period was short as our study period was limited to draw any long-term treatment results. It Definitely requires a larger number and longer duration of follow up.

Therefore, the similar work needs to be done across various institutions with different surgeons and require a long term follow for a more meaningful conclusion.

CONCLUSION

Overall mesh-related complications, including wound infection, seroma, hematoma, flap necrosis is quite rare. Less hospital stays and low recurrence rate was observed in preperitoneal method. On-lay mesh repair can be replaced with preperitoneal mesh repair.

As wound complications increase the risk of recurrence, the procedures that do not result in the formation of de-vascularizing flaps may be recommended.

ACKNOWLEDGEMENTS

The authors would like to thank Dr. Punyapu Sridhar sir, for his guidance in conducting the study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Panguluri ASNM, Komatreddy GR, Venkat PRG, Teja KS. A comparative study of on-lay and preperitoneal mesh repair in the management of umbilical hernia. Int Surg J 2023;10:110-3.