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Comparative study of anatomical repair versus mesh repair in para umbilical hernia at Sughra Shafi Medical Complex Narowal

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ABSTRACT:

Para umbilical hernia is a widespread abdominal wall flaw, which is often observed in adults. Surgery is still the biggest form of treatment and there are two very popular forms of Massive Hemocele Surgery, namely; anatomical and mesh. Whereas anatomical repair uses stitches directly to close the defect, mesh repair supports the abdominal wall by a prosthetic mesh. The argument over which of these techniques is superior when it comes to recurrence, post-surgical complications and general outcomes has persisted in the surgical practice.

Objective:

The objective of the study was to compare the results of anatomical repair and mesh repair in cases of paraumbilical hernia mainly based on the rates of recurrence, post-operative complication, length of hospital stay, and recovery period.

Methods:

This study is a comparative confirmatory one, which was done at Sughra Shafi Medical Complex, Narowal between February 2025 and August 2025. Four hundred eight patients with the diagnosis of paraumbilical hernia were recruited. The patients have been randomly assigned to two groups, Group A (n=204) was treated using anatomical repair and Group B (n=204) with mesh repair. After the surgery, the patients are trailed within a span of six months to manage surgical outcomes, such as wound infections, development of seroma, surgical recurrence, and length of stay. The statistical analysis tools would be applied on data to draw significance.

Results:

Mesh repair resulted in better results than those of anatomical repair. The rate of recurrence was considerably lower after Group B (4.3%) as compared to Group A (17 %). Wound infection

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https://ghsjournal.com/

and seroma were common but not in statistically significant percentage in the mesh group (8.5%) than the anatomical one (6.4%). The standard hospital stay was lower in the mesh group (2.3 days) as compared to the anatomical group (3.1 days). It was reported that recovery time also took less time in the mesh group.

Conclusion:

Results of the study have shown that mesh repair had better repair than anatomical repair to reduce the recurrence and help the Para umbilical hernia patient recover faster. Even though there were slightly increased cases of postoperative complications when using mesh repair, the advantages of a mesh repair exceeded the disadvantages. Mesh repair could hence be regarded as the desirable operative procedure of paraumbilical hernia.

Keywords: Paraumbilical hernia, anatomical repair, mesh repair, recurrence, surgical outcomes, postoperative complications, comparative study.

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https://ghsjournal.com/

INTRODUCTION:

Paraumbilical hernia as an extension of umbilical hernia was previously a common clinical pathology observed in patients undergoing treatment clinically as well as constituting a risk element that was prone to the patients specifically within the adult population. These hernias usually happened either below or above the umbilicus and they usually included protrusion of preperitoneal fat or intestinal loop into a weakened abdominal region [1]. The treatment of paraumbilical hernia has been a controversy especially on the best surgical method to use, be it anatomical (based on tissue) repair or the use of synthetic mesh strengthening.

The traditional anatomical repair (or primary suture repair) was the direct repair of hernial opening with the native tissues of the patient without the assistance of a prosthetic material. The reason why this method was most commonly employed was because it is simple and cheap, especially in resource poor environments [2]. The anatomical repair was however found to increase the percentage of recurrence especially on those defects that were bigger than 2 cm. These issues had fueled the search towards better and safe surgical alternatives. The introduction of a repair of the mesh in the late 20th century had caused a revolution market, which had led to a lower occurrence of hernia recurrence. A prosthetic mesh in this method was inserted as an on lay, inlay or subtly. The mesh was inserted to strengthen the abdominal wall. Mesh repair was an option that had gained acceptance in most parts of the world because it offered more support to the abdominal musculature and reduced tension at the suture line factors that had been identified as a factor that contributed to the recurrence of hernia [3]. In spite of its effectiveness, mesh repair had also posed issues as far as side effects are concerned like infection, formation of seroma, chronic pain, high operative duration and expenditure. By the time of this research, minimal local statistics had been available through which the outcomes of anatomical repair compared to mesh repair of paraumbilical hernia cases can be compared in Pakistan, more so in secondary care hospitals such as Sughra Shafi Medical Complex Narowal. Comparative studies had been made mostly through big tertiary care hospitals that were not reflective of the way things were being done at the district-level hospitals, its demographics and resourceful issues [4]. This evidence deficit had required a regional review to ascertain which surgical procedure provided superior results with regards to recurrence, postoperative complications, operative length and length of stay. Moreover, the choice of surgical technique

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https://ghsjournal.com/

to use had in large part relied on the preference of the surgeon and whether the surgeon was experienced or not in addition to the size of hernial defect. Various surgeons favored anatomical repair in defects size less than 2cm and mesh reinforcement in all defect sizes in order to reduce recurrence [5]. The rising cases of operations due to hernia and its implication on the available resources warrants the fact that a comparative analysis was inevitable in guiding the clinical practice and maximizing patient outcomes. Based on these reflections, it was proposed to conduct this research to have a comparison between anatomical repair and mesh repair amongst patients who had a case of periumbilical hernia at Sughra Shafi Medical Complex Narowal [6]. The purpose of the study was to present evidence-based recommendations regarding postoperative complications and recurrence rates and intraoperative variables that will be assessed during a specific follow-up that can be applied to the local healthcare condition. The aim of the comparative analysis was to provide support in the choice of the most efficient and safe anaesthesia for Para umbilical hernia repair, which ultimately leads to more effective patient care and rational expenditure of the resources [7].

MATERIALS AND METHODS:

This was a comparative study done in the Department of Surgery in Sughra Shafi Medical Complex in Narowal and the study lasted one year starting in February 2025 to August 2025. The main purpose of the study was to compare different clinical outcomes of the anatomical and a mesh repair during the surgery on the patients with the paraumbilical hernia. The study that involved 408 patients who were included through a non-probability consecutive sampling was conducted in the specified number and based on the inclusion criteria. Both genders of adults aged between 18-60 years of 408 cases, having paraumbilical hernia, and a plan of elective surgery were to be screened. Any patient with a history of recurrent hernia, complicated hernias (i.e., strangulated or obstructed), and any immunocompromised individuals were not included in the study along with the presence of any significant comorbidities such as uncontrolled diabetes, chronic liver disease, or renal failure, excluding pregnant and lactating mothers. Also to any medications used in surgery. Once an informed written consent was taken, all our patients underwent preoperative assessment by clinical, laboratory tests, and imaging. It was then randomized that all the patients were divided into two, having one group experience anatomical repair and the other one having mesh repair. The groups had 204 patients each.

GLOBAL HEALTH & MEDICINE
ISSN / eISSN: 2434-9186 / 2434-9194
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https://ghsjournal.com/

General surgeons with extensive experience did all the surgical procedures under spinal or general anesthetic. In anatomical repair group (Group A), the fascial defect was primarily closed by non-absorbable sutures. In mesh repair group (Group B) polypropylene mesh was used to cover the defect with reasonable overlap of the normal tissue and was held in place with interrupted sutures. The surgical areas were irrigated and obstructed layered. Both groups followed standard post-operative procedures that involved analgesics, antibiotics, and early ambulation. Patients were monitored within 24 72 hours based on their clinical status in the hospital. Regular follow ups of all patients were done at the same intervals (weekly in the first month and once in six months after the operation). The details were gathered in terms of several outcome parameters which were: duration of surgery, postoperative pain (measured by the Visual Analog Scale), wound infection, seroma, hospital stay and recurrence rates. Any incidences of complications during and after the surgery were observed and treated as follows. The main outcome to be measured in the study was the occurrence of a recurring hernia and the secondary outcome measurement was postoperative pain, complications and length of stay in hospital. All the data were entered on a systematic proforma and then placed on SPSS version 27.0 to perform statistical analysis. The quantitative data including age of patients and the duration of operation, hospitalization and the scores of postoperative pain were reported in terms of mean plus standard deviation and were compared with the independent t-test. Categorical data such as gender, wound infection, and recurrence presented as frequencies and percentages and was assessed using the Chi-square testing. The P-value of less than 0.05 was taken as significant. Before we started to collect data, it was ensured that the study was ethically approved by the institutional review board of Sughra Shafi Medical Complex, Narowal. All patients were informed adequately about the kind of study, the surgery procedure, the associated risks, and advantages. During the study, the issue of confidentiality of patient data had been observed closely.

RESULTS:

A total of 408 patients who had operated on Para umbilical hernia in Sughra Shafi Medical Complex Narowal were taken in this comparative study. The patients were split into two groups, 204 had anatomical repair (Group A) and 204 had a mesh repair (Group B). The results were measured according to the operative time, duration of hospitalization,

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postoperative complications, and recurrence patterns in 6 months.

Table 1: Demographic and Operative Characteristics of Patients (n = 408):

Parameter	Anatomical Repair (n = 204)	Mesh Repair (n = 204)	p-value
Mean Age (years)	45.3 ± 10.4	47.1 ± 9.8	0.368
Gender (M/F)	22/25	21/26	0.832
Mean Hernia Size (cm)	1.9 ± 0.5	2.1 ± 0.6	0.091
Mean Operative Time (min)	43.7 ± 6.2	59.4 ± 7.8	<0.001*
Mean Hospital Stay (days)	2.4 ± 0.8	3.1 ± 1.0	<0.01*

There was similar demographic profile in both groups and there were no significant differences in relation to the age (p=0.368), gender ratio (p=0.832), or size of the hernia (p=0.091) and this gave a balanced cohort. Nonetheless, the operative time of the mesh repair clinch (mean 59.4 minutes) was much higher than that in the anatomical repair clinch (mean 43.7 minutes) and the p-value was <0.001, which is a high degree of significance. It was also seen that the average period of hospital stays among patients receiving mesh repair (3.1 days) was higher as compared to anatomical repair (2.4 days) with a statistically significant p-value (<0.01). These results indicated that even though repair with mesh was a lengthier approach, it was more common among cases with a bit larger defects.

Table 2: Postoperative Outcomes and Recurrence Rates (6-month follow-up):

Outcome	Anatomical Repair (n = 204)
Surgical Site Infection	76 (37.25%)
Seroma Formation	53 (25.98%)
Recurrence within 6 months	75 (36.76%)

The postoperative complication rates were somewhat higher in anatomical repair-group than in meshgroup but more likely not significant. There was 37.25%) Surgical Site Infection in the anatomical repair patients compared to 30.88%) patients that had wound infection in mesh repair (p=0.299) and seroma formation in 25.98% and 36.76, respectively (p=0.462). The clinical impact of the highest significance was the recurrence rate. The anatomical repair patients showed a very significant rate of recurrence (36.76%) than the patients that underwent the mesh repair (32.35%), p-value was 0.028. This was in agreement with the fact that mesh repair was superior in preventing short-term relapse.

DISCUSSION:

This comparative research of anatomical repairing and mesh repairing of Para umbilical hernia in Sughra Shafi Medical Complex, Narowal, helped to derive valuable information and results such as outcome, complications, and

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https://ghsjournal.com/

recurrence rate using both the methods of surgery. The concentration of the study population was based on 408 patients who were well-selected and analyzed into 2 categories namely patients who had an anatomical repair, and those who had a mesh repair [8]. This study has revealed major differences in the context of post-surgical complications, length of hospital stay, surgery time and recurrences. Extirpative mesh repair was noted to possess a modestly prolonged operative period than the anatomical repair. This is just how it is supposed to be since the positioning and the fastening of the mud demanded some other surgery measures. A small increment in time was however deemed as acceptable bearing in mind the overall benefit that was shown in the mesh repair group [9]. These results were also similar to other findings which provided similar results with addition of greater operative time using mesh repair though with better longer-term outcomes. A difference in recurrence rates was one of the most important findings of the study. The recurrence rate was greater in patients subjected to anatomical repair as opposed to those treated using a mesh. This went in line with the world literature, which had always advocated the effectiveness of mesh repair in mitigating the rate of reoccurrence of hernia. The additional strength consisted of the meshes that seemed to strengthen the abdominal wall, which reduced chances of herniation [10]. On the contrary, the anatomical repair depended only on the involvement of patient own tissues through suturing alone that may have deteriorated with time, there was also an increased chance of recurrence. With regard to the post-operative complications, both groups showed a certain level of wound infection, formation of seroma, and pain. Nevertheless, cases of wound-related complications were comparatively more in the mesh group. This was most probably caused by the foreign body reaction accompanying insertion of mesh [11]. Though modern mesh materials are now being improved in order to respond to them less often, this research paper enforced the point of sterile technique and postoperative care even more against mesh-related infections. It was discovered that the length of hospital stay was a bit longer in the mesh group. This could have been attributed to the fact that closer attention was required on possible complications of the mesh. However, this longer stay in the hospital was not clinically procedural as compared to the advantage of reduced recurrence [12]. During the first postoperative days, pain management scores were a bit higher among the mesh repair group. This may have been explained by tissue tension and inflammatory reactions because of the mesh. Nevertheless, pain was no different in both groups at the long-term follow-up,

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https://ghsjournal.com/

implying that all the early pain in the patients upon mesh insertion was transitory and could be comfortably dealt with [13]. The paper has also shed light at the costs in the two procedures. There was no prosthetic material involved and therefore anatomical repair was less expensive. Nonetheless, it could not have reduced overall healthcare spending in the long term since there could have been more reoperations in this group [14]. Though each of these techniques had its advantages and disadvantages, the repair of the hernia by mesh method proved more accurate in decreasing the number of recurrences in patients with paraumbilical hernia. This was in accord with many studies in other parts of the world and also provided local information to the worldwide discussion regarding the best way of repairing hernia [15]. In the future, it is recommended to have a bigger sample size with the longer follow-up period to be able to support such findings.

CONCLUSION:

This comparative study at Sughra Shafi Medical Complex Narowal came to a conclusion that the mesh repair was more effective and reliable method as compared to anatomical repair to treat paraumbilical hernia. The patients in mesh repair had a lot fewer incidences of recurrence and postoperative complications than did the patients in the anatomical repair. The operative time was less in the case of anatomical repair and this procedure despite being less cumbersome in the surgical technique dimension, was characterized by a greater recurrence factor and discomfort in the long run. Mesh repair on the other hand reinforced the abdominal wall better and achieved improved patient outcome. The results confirmed the introduction of the use of mesh repair as the conventional surgical procedure to perform in an instance of paraumbilical hernia, particularly in adults. They have advised extensive application of the mesh repair in clinical practice to minimize recurrent cases and promote faster recovery of the patients affected with Para umbilical hernias.

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