SJIF Impact Factor: 5.464

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 8.
Issue: 2
Page N. 134-139
Year: 2024

Original Article www.wjahr.com

MESH RELATED COMPLICATIONS AND QUALITY OF LIFE OF PATIENTS WITH INGUINAL HERNIA REPAIR IN NINEVEH

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Article Received date: 14 December 2023 **Article Revised date:** 04 January 2024 **Article Accepted date:** 24 January 2024

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ABSTRACT

Background: Inguinal hernia is the most common type, with two types. Mesh repair is recommended due to its ability to reduce recurrence risk. European Guidelines recommend mesh-based techniques for male adults over 30 with symptomatic groin hernia. **Aim of the study:** To evaluate the complications among the patients after inguinal hernia repair with mesh in Nineveh. **Patients and Methods:** A study at Al-Salam Teaching Hospital in Nineveh involved 190 patients with inguinal hernia who underwent mesh repair. Preoperative factors included age, BMI, sex, and pain score. Intraoperative variables included mesh size, mesh type, and fixation method. Postoperative outcomes were measured using SOMS and CCS, with higher scores indicating better physical functioning and satisfaction. **Results:** The study involved 53.7±2.4 years of age, 30.9±6.3 BMI, 90.5% males, 9.5% females, and 26.3% open approach. Hernia size was 3.9±0.7 cm, mesh size 150-300 cm2, and tack used in 20.5% of operations. The study found a decreasing pattern in pain impact, quality, VAS, and fatigue post-operatively, while physical functioning improved post-operatively. Body image and satisfaction increased postoperatively. The study found an increasing trend of patients with no symptoms three months after surgery, with mild pain scores of 61.4%, 50.0%, and 62.2% respectively. **Conclusions:** The study concluded that inguinal hernia repairing with mesh was significantly enhances patient quality of life, with minimal morbidity and low recurrence rates. The procedure is safe, minimally invasive, and has numerous quality of life tools.

KEYWORDS: Complications, Inguinal hernia, Mesh, surgical repair.

INTRODUCTION

The most common kind of hernia in both men and women, although it affects males more frequently, is the inguinal hernia, which patients frequently refer to as a rupture. There are two main varieties of inguinal hernias, known as direct and indirect, with distinct anatomical features, causes, and complications. Despite their differences in surgical repair approaches and close anatomical proximity, they share the same final restoration of the compromised anatomy.[1]

With very few exceptions, mesh should always be used for hernia repair, regardless of the surgical method. Compared to non-mesh surgery, mesh repair lowers the chance of a hernia recurrence, according to several studies.[2-4] A comprehensive meta-analysis of 25 trials revealed that for every 46 mesh repairs related to inguinal hernias, one hernia recurrence was avoided.[5] Patient-reported outcome measures and health-related quality of life following hernia surgery have gained importance as recurrence rates have declined as a result of mesh use.[6–9]

In fact, according to the European Guidelines, any male adult over 30 who presents with symptoms of a groin hernia should have the surgery performed using a mesh-based approach (grade of recommendation-A).[10,11] While Lichtenstein's recommended onlay implantation of a flat mesh remains the conventional procedure for groin hernia repair, other innovative meshes and surgical modifications, such as 3-D devices and laparoscopic IHR, have emerged over time. When it comes to overall morbidity, chronic pain, and recurrence, practically all mesh approaches have produced results that are similar.[12–14] Because of this, the best way to treat a groin hernia should be determined by factors such as surgeon experience, patient and hernia-related characteristics, and available resources in the area or country.[10, 11]

The most frequent adverse events for all surgical hernia repairs—with or without mesh—are pain, infection, hernia recurrence, adhesion, or scar-like tissue that holds tissues together; obstruction of the large or small intestine; bleeding; fistulas, or abnormal connections between organs, vessels, or intestines; fluid build-up at the surgical site; and perforations, or holes in nearby tissues or organs. These findings are based on an analysis conducted by the FDA on medical device adverse event reports and peer-reviewed scientific literature. Additional unfavorable outcomes for mesh hernia repairs include the migration or shrinkage (contraction) of the mesh itself, which is more likely to be connected to the difficulties of hernia repair that were previously discussed.[15]

Aim of the study

To evaluate the complications among the patients after inguinal hernia repair with mesh in Nineveh.

PATIENTS AND METHODS

At the Nineveh governorate's Al-Salam Teaching Hospital, a cohort research design was used. The researcher gathered the information between May 2021 and June 2022. The 190 inguinal hernia patients who were admitted to the hospital for mesh repair using any method—open or laparoscopic—were included in the study. Individuals who had a concurrent non-hernia repair or were receiving emergency hernia surgery without mesh installation were not included.

Patient age, sex, body mass index (BMI), American Society of Anesthesiologists (ASA) class, and the lowest preoperative pain level on a visual analogue scale were among the preoperative factors. The length of time spent in the operating room (OR), the surgical technique, the extent of the hernia, the kind and size of the mesh, and the use of tacks for fixation were all considered intraoperative variables. Length of stay (LOS), emergency room visits within 30 days of surgery, readmission within 30 days of the procedure, number of days spent taking narcotic medication, time until returning to activities of daily living (ADLs), occurrence and follow-up periods, rates of mesh infection, and recurrence and follow-up period were among the postoperative variables.

The patients were reexamined using the Surgical Outcomes Measurement System (SOMS) and the Carolinas Comfort Scale (CCS). The patients completed the SOMS prior to surgery as well as three, six, and twelve months later, but the CCS was only completed following surgery. The SOMS survey is intended to quantify certain post-operative outcomes, such as pain, weariness, and physical functionality. The Pain Impact (range 6 to 30), Pain Quality (4 to 21), Pain Visual Analog Scale (VAS) (0 to 10), Fatigue (7 to 35), and Physical Functioning (7 to 36) dimensions are all included in the preoperative SOMS survey instrument. These same domains are included in the postoperative questionnaires along with Body Image (4 to 20) and Satisfaction (0 to 11). Higher values are better for Physical Functioning and Satisfaction, while lower scores are better in all other categories. The CCS is a well-validated, hernia-specific quality of life assessment that has shown to be stable and reliable for long-term follow-up in patients undergoing hernia repair, regardless of the kind of hernia.14 This survey, which is only provided to individuals who have had surgery, covers the three subdomains of mesh sensation, discomfort, and movement constraints. The next step is to calculate the CCS total score, which ranges from 0 for "no symptoms" to 5 for "disabling" symptoms.

RESULTS

Table 1 showed the patients characteristics and demonstrated that the mean age was 53.7±2.4 years with mean BMI was 30.9±6.3. The males constituted 90.5% while the females 9.5%. Most of the study sample were underwent laparoscopic approach while the open approach was done in 26.3%. The hernia size was 3.9±0.7 cm and the mesh size ranged from 150 to 300 cm^2 with 80.0% of the mesh was of the Monofilament Polyester's type. The tack was used in 20.5% of the operations. The mean length of stay in the hospital after the operation was 48.6±4.7 hours.

Table (1): The patients characteristics.

Patient Characteristics		Statistical value
Age (year)	Mean± SD	53.7±2.4
BMI (kg/m^2)	Mean± SD	30.9±6.3
Sex	Males/no.(%)	172(90.5)
	Females /no.(%)	18(9.5)
Surgical approach	Open/no.(%)	50(26.3)
	Laparoscopic/no.(%)	140(73.7)
OR time	Mean± SD	51.2± 7.5
Hernia size, cm	Mean± SD	3.9±0.7
Mesh size, cm^2	Range	150-300
Mesh type, n (%)	Monofilament Polyester	152(80.0)
	Monofilament Polypropylene	17(8.9)
	Monofilament Polypropylene Plug	21(11.1)
Tack use	No.(%)	39(20.5)

LOS/hours	Mean± SD	48.6±4.7
Narcotics stopped/ hours	Mean± SD	31.5±2.6
Return to ADL/days	Mean± SD	6.3±1.2
Mesh infection	No.(%)	6(3.2)
Mesh explanation	No.(%)	2(1.1)
Recurrence	No.(%)	4(2.1)

The SOMS category was demonstrated in table (2) which revealed that significant decreasing pattern concerning the pain impact, pain quality, pain VAS, and Fatigue. While the physical functioning showed an improvement in the post-operative follow up period intervals. The body image, and the satisfaction were evaluated only postoperatively and showed an increasing means with the time postoperatively.

Table (2): SOMS category.

SOMS category	Pre-operative (n=190)	3 months post-op (n=188)	6 months post-op (n=168)	12 months post-op (n=171)	P-value *
	mean±SD	mean±SD	mean±SD	mean±SD	
Pain impact (6-30)	10.3±6.2 A	10.1±5.9 A	8.4±2.7 B	7.9±1.4 B	**0.000**
Pain quality (4-21)	8.9±3.4 A	8.3±3.5 A	6.8±2.8 B	6.1±2.2 B	**0.000**
Pain VAS (0-10)	3.6±1.8 A	2.7±1.2 B	2.1±0.9 C	1.3±1.1 D	**0.000**
Fatigue (7-35)	15.1±4.9 A	13.9±5.2 AB	13.5±4.6 B	13.1±3.4 B	**0.003**
Physical functioning (7-37)	30.9±2.4 A	31.5±2.1 B	33.7±1.8 C	35.4±1.2 D	**0.000**
Body image (4-20)	------	4.9±1.8 A	5.6±2.1 B	6.7±1.7 C	**0.000**
Satisfaction (0-11)	------	8.2±2.2 A	8.6±2.1 A	9.1±1.3 B	**0.000**

By using the Carolinas Comfort Scale, the table (3) showed that in terms of the mesh sensation score, pain score, movement limitations, and overall CCS score, there was an increasing trend in the proportion of patients who had no symptoms three months after surgery compared to twelve months later. The post-operative scores for these patients were, respectively, 61.4%, 50.0%, and 62.2% for mild pain with or without bothersome sensation of mesh, pain, and movement limitations.

Table (3): Carolinas Comfort Scale.

	3 months post-op (n=188)	6 months post-op (n=168)	12 months post-op (n=171)
CCS Mesh Sensation Score (0-5)	No.(%)	No.(%)	No.(%)
No symptoms	83(44.1)	107(63.7)	145(84.9)
Mild/not bothersome	40(21.3)	22(13.1)	12(7.0)
Mild/bothersome	27(14.4)	19(11.2)	6(3.5)
Moderate/daily	18(9.6)	9(5.4)	5(2.9)
Severe	12(6.4)	6(3.7)	2(1.2)
Disabling	8(4.2)	5(2.9)	1(0.5)
CCS Pain Score (0-5)	No.(%)	No.(%)	No.(%)
No symptoms	73(38.8)	115(68.5)	139(81.3)
Mild/not bothersome	22(11.7)	18(10.7)	12(7.0)
Mild/bothersome	19(10.1)	14(8.3)	9(5.3)
Moderate/daily	15(7.9)	10(5.9)	7(4.1)
Severe	13(6.9)	8(4.8)	3(1.8)
Disabling	4(2.1)	3(1.8)	1(0.5)
CCS Movement Limitations (0-5)	No.(%)	No.(%)	No.(%)
No symptoms	89(47.3)	127(75.6)	153(89.4)
Mild/not bothersome	28(14.9)	11(6.5)	6(3.5)
Mild/bothersome	20(10.6)	9(5.4)	4(2.3)

Moderate/daily	19(10.1)	9(5.4)	3(1.8)
Severe	17(9.0)	7(4.2)	3(1.8)
Disabling	15(7.9)	5(2.9)	2(1.2)
CCS Total Score (0-5)	No.(%)	No.(%)	No.(%)
No symptoms	49(26.1)	94(55.9)	103(60.2)
Mild/not bothersome	68(36.2)	29(17.3)	34(19.9)
Mild/bothersome	31(16.5)	23(13.7)	17(9.9)
Moderate/daily	22(11.7)	13(7.6)	10(5.8)
Severe	12(6.4)	6(3.7)	5(2.9)
Disabling	6(3.1)	3(1.8)	2(1.2)

DISCUSSION

The present study showed that the mean age was around the 59 years with the predominance of males gender, these findings were run in parallel to that of Krpata *et al.*,[16] and Gitelis *et al.*,[17] The study sample was obese, with a mean BMI of 30.9±6.3. Although obesity has been thought to increase the incidence of inguinal hernia by increasing abdominal pressure, most reports.[18] show that the risk of developing an inguinal hernia is actually lower in overweight and obese patients. The operation time among the current study with the mean duration of narcotic pain medication use and the return to activities of daily living and work postoperatively were matched with the findings of Gitelis *et al.*,[17] and Ujiki *et al.*[19]

The post-operative complications in the present study involved only mesh infection, explanation, and recurrence which were found in 3.2%, 1.1%, and 2.1% respectively of the studied sample. Postoperative complications were generally less common in our study than they were in the literature. According to Beard et al.[20] 8.0% of the trial participants experienced a wound infection that required antibiotic therapy. In Uganda (3.4%) as well as in comparison to results from high-income environments (0%–4.8%)[21] This higher level might point to a difference in how postoperative infection is diagnosed and treated, as well as a de facto higher risk of infection in the study context relative to other settings. In worldwide surgery, infection prevention and control are critical and a major area of focus for quality improvement programs[22] The total hernia recurrence rate was comparable to that found by Forester *et al.*,[25] but it was greater than the findings from both low- and high-income settings (0.5%–3.8%).[5,21,23,24] The average length of stay (LOS) in a hospital for the current study sample was approximately two days. This was in line with the findings of a meta-analysis carried out by Awaiz *et al.*,[26] which found that LOS in hospitals varied from two to five days, as well as the findings of observational studies by Soliani *et al.*,[27] Lavanchy *et al.*,[28] and Lavanchy *et al.*,[29] which found that the average length of stay (LOS) in hospitals ranged from 1.9 to 6 days.

In relation to the SOMS, the current investigation demonstrated that a decreasing approach was observed with statistically significant relationships when comparing the postoperative pain effect, quality, VAS, exhaustion, and physical functioning with the preoperative data-base. Only after surgery were body image and satisfaction measured, and over time, both showed considerable improvements. These results aligned with those of Forester *et al.*,[25] who found that after 3 weeks, 6 months, 1 year, 2 years, 3 years, 4 years, and 5 years postoperatively, there was a substantial improvement in pain Impact on Quality of Life score and SOMS Pain VAS compared to baseline. Furthermore, Itani *et al.*,[30] found that physical functioning produced better results in terms of time taken to resume employment (28 versus 23 days) and return to regular daily activities (14 versus 8 days). There aren't many prior research regarding the return to regular activities. The median time to return to work in Olmi *et al.*,[31] 85 patients was 13 days, which was notably less than the 28 days in this investigation. A previous study by Courtney *et al.*,[32] investigated the impact of persistent pain on everyday activities and quality of life in a prospective cohort of Scottish patients who reported experiencing severe or very severe pain three months after groin hernia surgery. It also investigated the relationship between chronic post-operative pain and quality of life (SF36) in patients who had undergone hernia repair.

Prospective studies were conducted by Romain *et al.*,[33] Mier *et al.*,[34] and Kuo *et al.*,[35] to assess the long-term quality of life of patients with inguinal hernias based on pre-operative symptomatology. The findings showed similar patterns in the prevalence of pre-operative pain (>25%) compared to pain at two years (<5% of cases), with moderate pain being the most common type.[33–35] Likewise, individuals with no pain or very little pain experience a quicker restoration of quality of life ($p = 0.048$)[34] In particular, Kuo *et al.*, study[35] linked global outcomes and the utilization of medical resources to general clinical features as well as pain ($p < 0.05$). As a result, it is evident that pain, which behaves similarly regardless of the surgical method employed, is the primary symptom assessed as a predictor of functional outcome.[36] While other symptoms have been mentioned in certain research, they do not appear to have a major or relevant impact on the quality of life, either physically or emotionally.[35] When comparing the number of patients without symptoms at 3 months after surgery to that at 12 months later, there was an increasing pattern in the CCS score for the mesh sensation score, pain score, movement limits, and overall CCS score. Following surgery, the scores for no symptoms, light discomfort, and movement limits with or without unpleasant were 61.4%, 50.0%,

and 62.2%, respectively. The percentage of patients reporting no symptoms or mild but not unpleasant symptoms on the Carolinas Comfort Scale following surgery for sensation of mesh, pain, and movement limits was 98%, 95%, and 97%, respectively. These results were less than those reported by Gitelis *et al.*,[17] Similarly, only 3.9%, 3.2%, and 3.1% of patients reported significant or incapacitating mesh sensation, discomfort, and movement impairments, respectively, following surgery, according to Forester *et al.*,[25] The SF36 and CCS score were also used by Wennergren *et al.*,[37] in a prospective observational study, to evaluate the participants' quality of life. At the 1-year follow-up, there were notable improvements in the SF36 and CCS scores for physical function/movement and pain. Mean SF36 ratings for physical function, role physical functioning, and bodily pain first deteriorated in the 7–10 days after surgery, but by the 6-month and 1-year follow-up, they had returned to preoperative levels.41 patients (16%) experienced pain, 44(18%) felt mesh sensation, and 25 (10%) reported movement limitation, according to Jalil *et al.*,[38] analysis of the CSS scores. However, 5 patients (2%) for the pain category, 8 patients (3%) for the mesh feeling category, and 9 patients (3%) for the movement limitation symptom had severe or incapacitating mesh-related symptoms. A total of 190 patients (24%), in all three symptom categories, showed no symptoms at all.

CONCLUSION

The study concluded that inguinal hernia repairing with mesh was significantly enhances patient quality of life, with minimal morbidity and low recurrence rates. The procedure is safe, minimally invasive, and has numerous quality of life tools.

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