Bandar Alsakran et al, 2020;4(10):1652–1655.
https://doi.org/10.24911/IJMDC.51-1599143332

ORIGINAL ARTICLE

A single-center comparative study of laparoscopic versus open inguinal hernia repair for better outcomes in Qassim Region, Saudi Arabia

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ABSTRACT

Background: Inguinal hernias are a prevalent surgical condition. The present study aims to compare laparoscopic to open inguinal hernia repair for operation time, hospital stay, time to return to work, and chronic pain to determine a better outcome.

Methodology: This study is designed as a single-center retrospective study; an observational study was conducted from January 2016 to July 2019, at the Department of Surgery at King Fahad Specialist Hospital, Buraydah, Al Qassim, Saudi Arabia. All the cases of inguinal hernia repair operated in the center were included. The necessary biographic patient's data were collected from the patient's medical records. Furthermore, additional information was obtained from operation room records.

Results: A total of 202 patients were a part of this study. 167 (82.67%) had an open repair, and 35 (17.33%) laparoscopic repairs were done. The mean age of 202 patients was 45.85 ± 17.01 years; men were 197 (97.5%) included in this study. The operation time was 93.16 ± 39.01 versus 102.03 ± 45.50 (minutes), hospital stay 2.71 ± 2.90 versus 2.34 ± 2.03 (days), and return to work 13.36 ± 7.87 versus 9.33 ± 8.77 (day) in the open and laparoscopic group, respectively. Return to work was significantly less in the laparoscopic group than open hernia repairs. 177 out of 202 patients were assessed to determine the severity of chronic pain, but there was no significant difference between both groups. In addition, 16%-17% of the patients have developed problems at rest, 34%-38% within the regular activity, and 50%-52% during exercise.

Conclusion: Laparoscopically treated patients for inguinal hernia were an early return to work compared to the open approach. In consequence, smoking and employ are common associated factors with the laparoscopic group. Accordingly, the laparoscopic repair could be applied for smokers and employed patients for a better quality of life.

Keywords: Laparoscopic, versus, open, inguinal hernia, outcomes.

Introduction

Inguinal hernias are a very common surgical condition. It is an account for 75% of all ventral hernias [1]. In Saudi Arabia, AhmedAlenazi et al. [2] found that the second most common cases were inguinal (27.3%). Therefore, surgical intervention for inguinal hernia patients is common. Laparoscopic hernia repair is now the recommended method for patients with recurrent inguinal hernia or bilateral inguinal hernia [3]. Several recent studies showed that there is an insignificant difference in complication rate, and laparoscopic hernia repair is better than open repair in terms of less postoperative pain, less hospital stay, and early return to work [4], whereas the open repair is superior to laparoscopic hernia

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Received: 03 September 2020 | **Accepted:** 16 September 2020

repair regarding the operation time and recurrence rate [5,6]. Variant studies have been showing that there was a difference between laparoscopic and open hernia repair for better outcomes, but there are lacking data in the Middle East; therefore, we aim to compare laparoscopic to open inguinal hernia repair for operation time, hospital stay, time to return to work, and chronic pain to find out which has a better outcome in Qassim region, Saudi Arabia.

Subjects and Methods

This study is designed as a single-center retrospective study conducted from January 2016 to July 2019, at the Department of Surgery at King Fahad Specialist Hospital, Buraydah, Al Qassim, Saudi Arabia. This study was approved ethically from the administration of the hospital and the Institutional Review Board ethical research committee at the Al Qassim region. All the cases of inguinal hernia repair operated in the center from July 2016 to July 2019, regardless of gender or age, were included in this study. All patients who were not willing to give consent contraindicated to general anesthesia or class IV-V in American society of anesthesiologists (ASA) were excluded from the study. The basic biographic patient's data were collected from the patient's medical records. Furthermore, additional information was obtained from operation room records. The following variables concerning the study were achieved from the previously mentioned sources: operation time, hospital stay, time to return to work, and chronic pain. Chronic pain is defined as a pain developed following hernia repair and lasting for more than 6 months. Subsequently, the Numerical Rating Scale was used to assess the severity of the problem at rest, during routine activities, and during exercise. The collected data were coded, entered, and analyzed using the Statistical Package for the Social Sciences. A p-value of <0.05 was considered to be statistically significant.

Results

A total of 202 patients were part of this study. 167 (82.67%) had an open repair, and 35 (17.33%) laparoscopic repairs were done. The mean age of 202 patients was 45.85 ± 17.01 years; men were 197 (97.5%) included in this study. Regarding clinical presentation, 42.6% of the patients were symptomatic for more than 1 year, whereas the others within 1 year. The unilateral inguinal hernia was the most common presentation, which was observed in 92.6% of the patients. In this study, we found that the majority of the patients underwent elective hernia repair. However, 15 cases were operated emergency, which gives that 7% of the patients were presented with complicated inguinal hernia. Regarding the co-existing conditions, in this study, 62.9% of patients were medically free. However, hypertension (HTN) was highly associated among the cases, representing 24.7% of them followed by diabetes mellitus (17.8%) as presented in (Table1). With respect to the comparison of the outcomes, operation time was 93.16 ± 39.01 versus 102.03 ± 45.50 (minutes), hospital stay 2.71 ± 2.90 versus 2.34 ± 2.03 (days), and return to work 13.36 ± 7.87 versus 9.33 ± 8.77 (day) in the open and laparoscopic group, respectively (Table 2). Return to work was significantly less in the laparoscopic group than open hernia repairs. Regarding the association of employed/smoker's patients and laparoscopic hernia repair, this study observed that employed and smoker's patients were significantly related to laparoscopic hernia repair compared to the open group. Furthermore, when the assessment of chronic pain is considered, 177 out of 202 patients were assessed to determine the severity of chronic pain, but there was no significant difference between both groups. In addition, 16%-17% of the patients were developed pain at rest, 34%-38% within the normal activity, and 50%-52% during exercise.

Table 1. *Baseline characteristics of patients.*

Variables		Mean ± SD/*n* (%)
No. of patients (Male)		197 (97.5)
Age (years)		45.85 ± 17.01
Weight (kg)		74.69 ± 13.69
Height (cm)		167.25 ± 6.70
Body mass index (kg/m^2)		26.72 ± 4.81
Nationality (Saudi)		183 (90.6)
Marital status (Married)		154 (76.2)
Smoking		43 (21.3)
Employed		110 (54.4)
Co-existing conditions	None	127 (62.9)
	HTN	50 (24.7)
	Diabetes mellitus	36 (17.8)
	Asthma	9 (4.4)
	Benign prostatic hyperplasia	3 (1.4)
	Chronic kidney disease	2 (0.9)
	Chronic obstructive pulmonary disease	2 (0.9%)
	Chronic constipation	2 (0.9)
	More than one	29 (14.3)
Duration of complaint	<1 year	116 (57.4)
	>1 year	86 (42.6)
Hernia	Unilateral	187 (92.6)
	Bilateral	15 (7.4)
Procedure	Open	167 (82.7)
	Laparoscopy	35 (17.3)
Priority	Elective	187 (92.6)
	Emergency	15 (7.4)
ASA	I	94 (46.5)
	II	98 (48.5)
	III	10 (4.9)
Anesthesia	General	156 (77.2)
	Regional	46 (22.7)

Table 2. *Association and difference between patients who have open operation versus laparoscopic repair (Chi-square and t-test), *p-value of <0.05.*

Variables		Open *n* = 167	Laparoscopic *n* = 35	*p*-value
Age		46.22 ± 17.44	44.11 ± 14.94	0.508
Body mass index		26.76 ± 4.97	26.52 ± 3.98	0.789
Employed		86 (51.5%)	24 (68.6%)	0.048*
Smoking		40 (24.0%)	3 (8.6%)	0.03*
Operation time		93.16 ± 39.01	102.03 ± 45.50	0.237
Hospital stay		2.71 ± 2.90	2.34 ± 2.03	0.474
Return to work		13.36 ± 7.87	9.33 ± 8.77	0.011*
Side	Unilateral	156 (93.4%)	31 (88.6%)	0.249
	Bilateral	11 (6.6%)	4 (11.4%)	
Chronic pain	At rest	23 (16.2%)	6 (17.1%)	0.097
	Activities	54 (38.0%)	12 (34.3%)	0.407
	Exercise	74 (52.1%)	17 (50.0%)	0.063

Discussion

Overall, the mean age of 202 patients included in this study was 45 years old, and 97.5% were men. Consequently, the finding suggests that inguinal hernias were more frequent among middle-aged males. As well, the results are consistent with the study of Jamil et al. [4] and other studies [7]. In this study, we found that most of the patients present with a unilateral inguinal hernia that accounts for 92.6%, compared to Tseng et al. [8], which was nearly similar to the results. Furthermore, 62.9% of patients were medically free. However, HTN was the most common co-existing illness with inguinal hernia patients representing 24.7%. Meanwhile, diabetes mellitus was 17.8%, as we found a common relation in the other studies [9,10]. The result showed that the mean time taken intraoperatively was 93.16 minutes for the open group and 102.03 minutes for the laparoscopic group, indicating that available procedure less time taken relatively when compared to laparoscopic hernia repair. Yadav et al. [11] found that patients who underwent the open procedure had less time taken intraoperative than those who underwent laparoscopic hernia repair. Furthermore, the mean hospital stay was 2.71 and 2.34 days in the open and laparoscopic groups, respectively. Similarly, variant studies in agreement with the finding of laparoscopic hernia repair patients were less hospital stay than the open group [7,12]. Moreover, the mean time needed to return to work postoperatively was 13.36 days for the open group, whereas it was 9.33 days for the laparoscopic group (p-value < 0.011). Therefore, return to work was significantly less in the laparoscopic group than open hernia repairs. Further, the result was comparable to both Pate et al. [12] and Nassar et al. [7] studies. In this study, there was a relationship between smokers, and the laparoscopic approach possible explanation for this might be that smoking is believed to have significant effects on the patients' immune system and can delay healing and increase the risk of infection at the wound site [13]. Since the laparoscopic approach has less exposure to the body surface area, we believe that it can be one reason why there was a significant relation. Furthermore, the results reveal that the number of workers is higher in the laparoscopic approach. These results match those observed in earlier studies [14]. The previous studies have concluded that chronic pain is less with the laparoscopic approach [10,15]. Contrary to expectations, this study did not find similar results. 16.2% of the patients underwent the laparoscopic approach, who experienced pain at rest, 38% with moderate activities, and 52.1% with exercises compared with 17.1%, 34.3%, and 50%, respectively, with the open approach. A possible explanation for these results may be the lack of an adequate number of patients who underwent the laparoscopic procedure compared to the open system. To the best of authors' knowledge, this study is the first in the Qassim region, Saudi Arabia, to compare the two approaches of a hernia repair for better outcomes. Thus, the findings support the results of previous studies, which may help to choose each individual's type of procedure. In the current study, we had some limitations. Some of the patient data were missing; for example, intraoperative complications and early postoperative complications were not accurately reported. As well, the choice of procedure was based on patient condition, their relatives, and the surgeon's opinion. For that reason, there was an unbalance in the case number between the different groups. Furthermore, 35 patients could not be assessed for chronic pain due to the following factors: failure of contact, non-cooperative cases, and some died. Therefore, a new prospective study should be conducted in a specialized center to include a higher and balanced number of inguinal hernia patients.

Conclusion

Laparoscopically treated patients for inguinal hernia returned early to work compared to the open approach.

In consequence, smoking and employ are common associated factors with the laparoscopic group. Accordingly, the laparoscopic repair could be applied to smokers and employed patients for a better quality of life.

List of Abbreviations

HTN Hypertension

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

None.

Consent for publication

Informed consent was obtained from all the participants.

Ethical approval

This study was approved ethically from the administration of the hospital and the Institutional Review Board (IRB) ethical research committee at the Al Qassim region. (Al Qassim region, Saudi Arabia Ministry of Health, approval number: 1441-440510).

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