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EARLY OUTCOMES OF LAPAROSCOPIC VS OPEN IPOM REPAIRS FOR SMALL VENTRAL HERNIAS

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РАННИЕ РЕЗУЛЬТАТЫ ЛАПАРОСКОПИЧЕСКОЙ И ОТКРЫТОЙ ПЛАСТИКИ ИРОМ ПРИ НЕБОЛЬШИХ ВЕНТРАЛЬНЫХ ГРЫЖАХ

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Summary. The postoperative ileus and wound hematoma are frequent complications after ventral abdominal hernia repair.

My objective is to compare laparoscopic versus open ventral hernia repair in terms of frequency of postoperative ileus and wound hematoma formation.

Main outcome. The prolonged ileus and hematoma formation were outcomes

Study design. Randomized controlled trial

Setting. Department of General Surgery, Jinnah Hospital, Lahore

Duration of study. January 2020 to January 2022

Total of 70 patients were admitted through outpatient department of Jinnah Hospital Surgery Department after undergoing ventral abdominal hernia repair. The diagnosis was confirmed by history, relevant examination and investigations. I divided the patients randomly into two equal groups via computer generated random numbers i.e. A and B. In group A the laparoscopic approach was used while in group B, open repair of hernia was done. All surgical procedures were done under standard general anesthesia with cuffed endotracheal tube. All cases were operated by same surgical team. Standard postoperative care was provided to all the patients. All the patients were assessed for return of bowel sounds every hour until return of bowel activity. Hematoma formation was assessed daily up to 72 hours. Data was analyzed using SPSS version 24. Quantitative variables like age was expressed via mean and standard deviation. Frequencies and percentages were calculated for qualitative data like gender, prolonged ileus and hematoma formation. Both groups were compared among each other in terms of hematoma formation and prolonged ileus by Chi square test. Effect modifiers like age, gender and BMI were controlled by stratification. Post stratification Chi square test was applied. P value ≤ 0.05 was considered as statistically significant.

The mean age and BMI were 41.29 ± 12.755 years and 26.80 ± 3.278 kg/m² respectively. The female gender was dominant as 70% cases were females. The prolonged ileus and hematoma formation were evident in 51.4%. There was no difference between groups in terms of age, gender and BMI distribution as p values were 0.382, 0.794 and 0.942 respectively. The prolonged ileus and hematoma formation were statistically significant among groups. The group B has more frequency of prolonged ileus and hematoma formation as compared to group A (p values 0.004 and 0.017 respectively). The data was stratified according to age, gender and BMI. The results showed that difference in frequency of prolonged ileus remained significant among groups for age >40 , female gender and BMI >27 kg/m² (p values 0.005 and 0.007 respectively). The frequency of hematoma formation was significant among groups for age >40 and male gender (p values 0.031 and 0.049 respectively).

The laparoscopic approach for ventral abdominal hernias is associated with reduced frequency of hematoma formation and prolonged ileus.

Key words: Hematoma, Hernia, Herniorrhaphy, Ileus, Laparoscopy, Wound Dehiscence, Mesh.

Резюме. Послеоперационная кишечная непроходимость и раневая гематома являются частыми осложнениями после пластики вентральной грыжи живота.

Моя цель – сравнить лапароскопическую и открытую пластику вентральной грыжи с точки зрения частоты послеоперационной кишечной непроходимости и образования раневых гематом.

Исходами были длительная кишечная непроходимость и образование гематомы.

Дизайн исследования – рандомизированное контролируемое исследование.

Место проведения – отделение общей хирургии больницы Джинна, Лахор.

Продолжительность обучения – с января 2020 г. по январь 2022 г.

Через амбулаторное отделение хирургического отделения больницы Джинна поступило 70 пациентов после операции по пластике вентральной грыжи живота. Диагноз подтвержден данными

анамнеза, соответствующими обследованиями и исследованиями. Я случайным образом разделил пациентов на две равные группы с помощью случайных чисел, сгенерированных компьютером, то есть А и В. В группе А использовался лапароскопический доступ, а в группе В – открытая пластика грыжи. Все хирургические процедуры проводились под стандартной общей анестезией с использованием эндотрахеальной трубки с манжеткой. Все случаи оперировались одной хирургической бригадой. Всем пациентам оказывалась стандартная послеоперационная помощь. У всех пациентов оценивалось восстановление кишечных шумов каждый час до восстановления активности кишечника. Образование гематомы оценивали ежедневно в течение 72 часов. Данные были проанализированы с использованием SPSS версии 24. Количественные переменные, такие как возраст, выражались через среднее значение и стандартное отклонение. Частоты и проценты рассчитывались для таких качественных данных, как пол, длительная кишечная непроходимость и образование гематомы. Обе группы сравнивались между собой по показателям образования гематом и длительной кишечной непроходимости с помощью теста Хи-квадрат. Модификаторы эффекта, такие как возраст, пол и ИМТ, контролировались стратификацией. Был применен критерий Хи-квадрат после стратификации. Значение $P \leq 0,05$ считалось статистически значимым.

Средний возраст и ИМТ составили $41,29 \pm 12,755$ года и $26,80 \pm 3,278$ кг/м² соответственно. Женский пол преобладал: 70% больных составляли женщины. Длительная кишечная непроходимость и образование гематом наблюдались у 51,4%. Не было различий между группами по возрасту, полу и распределению ИМТ, поскольку значения p составляли 0,382, 0,794 и 0,942 соответственно. Длительная кишечная непроходимость и образование гематом были статистически значимыми среди групп. В группе В выше частота образования длительной кишечной непроходимости и гематом по сравнению с группой А (значения p – 0,004 и 0,017 соответственно). Данные были стратифицированы по возрасту, полу и ИМТ. Результаты показали, что разница в частоте длительной кишечной непроходимости оставалась значимой среди групп для возраста >40 лет, женского пола и ИМТ >27 кг/м² (значения p – 0,005 и 0,007 соответственно). Частота образования гематом была достоверной среди групп возраста >40 лет и мужского пола (значения p – 0,031 и 0,049 соответственно).

Лапароскопический доступ при вентральных грыжах живота связан с уменьшением частоты образования гематом и удлинения кишечной непроходимости.

Ключевые слова: гематома, грыжа, герниорафия, кишечная непроходимость, лапароскопия, расхождение раны, сетка.

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Для цитирования: Саджид Малик. РАННИЕ РЕЗУЛЬТАТЫ ЛАПАРОСКОПИЧЕСКОЙ И ОТКРЫТОЙ ПЛАСТИКИ ИПОМ ПРИ НЕБОЛЬШИХ ВЕНТРАЛЬНЫХ ГРЫЖАХ. INNOVATIVE SURGERY ON THE SILK ROAD. 2024; 2(2):27-34.

Introduction. The hernia is a defect in the fibromuscular tissues of the body wall. The defects which permit internal contents to protrude are subjected to surgery. The groin hernia is most common and ventral hernias are second most common among all patients [1]. Inguinal hernias dominate in male gender while ventral abdominal hernias dominate in the females. During early era the main management of hernias was trusses and bandages. Various techniques and methods evolved and now day's open and laparoscopic approaches both are in use [2].

In 1993, first report of laparoscopic approach for incisional hernia was used. This approach gained attention due to label of minimally invasive approach. A large data is there for evaluation of this technique, but it has not gained the label of gold standard for hernia repair due to many constraints i.e. technical demanding, increased operative timings etc [3]. The advantages may be short hospital stay, less blood loss and decreased postoperative pain. Open versus laparoscopic approach for ventral hernias are under continuous discussion and evaluation to produce best possible outcomes [4, 5]. Malik, A. M. (2015) showed that after laparoscopic ventral hernia repair postoperative ileus and hematoma formation was less as compared to open mesh repair i.e. 7.25% versus 32.43% (prolonged ileus) and 1.61% versus 23.64% (hematoma formation) for laparoscopic and open approaches respectively [6].

In my study I want to compare laparoscopic and open repair of ventral hernias in terms of prolonged ileus and hematoma formation in our population. Due to limited economical resources and recent research data, my study would help us to select better procedure in terms of outcomes in ventral hernia patients. This would reduce the morbidity and hospital costs also.

Material and methods.**Setting:**

Department of General Surgery, Jinnah Hospital, Lahore

Duration of study:

January 2020 to January 2022

Study design:

Randomized controlled trial

Sample size:

Sample size of 70 cases (35 in each group) is calculated with 80% power of test, 5% level of significance and taking expected proportion of prolonged ileus of 7.25%⁶ and 32.43%⁶ for laparoscopic and open repairs respectively.

Sampling technique:

- Consecutive Non-probability sampling

Inclusion criteria:

- Patients diagnosed with ventral abdominal hernia as per operational definition.
- Patients with age range of 18 to 60 years
- Both male and female patients

Exclusion criteria:

- H/O chronic illness like DM, IHD, CRF, CLD as depicted from history and investigations
- Previous history of any malignancy or its treatment within last 03 years.
- Patients with use of NSAIDS in last 07 days from surgery.
- Previous abdominal surgery.
- Hernia defect of >10 cm in any direction.
- Incarcerated, obstructed or strangulated hernias
- Pregnant patients
- Patients unwilling for consent

Procedure of data collection. after required permission from the concerned authorities and ethical committee, total of 70 patients were admitted through outpatient department of jinnah hospital surgery department after fulfilling inclusion and exclusion criteria. the diagnosis was confirmed by history, relevant examination and investigations. demographic data was noted down and informed written consent was taken from all patients as necessary pre-requisite. pre-anesthesia workup was completed. inj. cefuroxime 750 mg iv was given to all patients within 60 minutes before surgery and two more doses were given at 8 and 16 hours after surgery. i divided the patients randomly into two equal groups via computer generated random numbers i.e. a and b. in group the laparoscopic approach was used while in group b, open repair of hernia was done. all surgical procedures were done under standard general anesthesia with cuffed endotracheal tube. all cases were operated by same surgical team. in group a, the bladder and stomach were decompressed by way of foleys and nasogastric catheters. after creating pneumoperitoneum with verress needle at palmer's point three ports was used. the sac was reduced after adhesolysis and proline mesh was placed with covering of more than 3 cm defect all around. mesh was fixed with the sutures at corner. additional fixation was achieved by endo tacker. in group b, the open repair was done. after transverse incision at hernia bulge, the sac was separated, reduced and defect was closed primarily with proline 1 suture. mesh was fixed with proline 2/0 with covering >3 cm area around defect. hemostasis was secured and wound was closed in two layers. all patients were given 3 doses of inj. ketorolac 30mg iv (analgesic) and inj. ranitidine 50 mg iv (antacid) 8 hourly. standard postoperative care was provided to all the patients. all the patients were assessed for return of bowel sounds every hour until return of bowel activity. hematoma formation was assessed daily up to 72 hours. all the data was recorded on the specially designed performa attached as annexure a.

Data analysis. Data was analyzed using spss version 24. quantitative variables like age was expressed via mean and standard deviation. frequencies and percentages were calculated for quali-

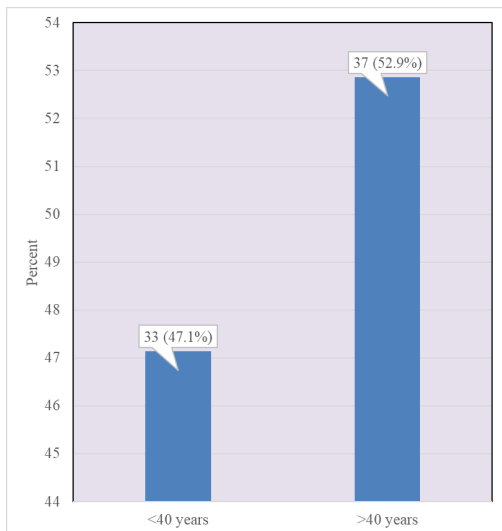


Figure 1. Bar graph of age distribution

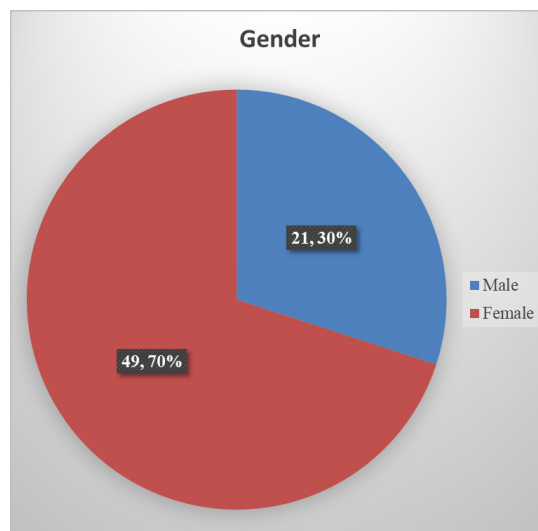


Figure 2. Pie chart of gender distribution

tative data like gender, prolonged ileus and hematoma formation. both groups were compared among each other in terms of hematoma formation and prolonged ileus by chi square test. effect modifiers like age, gender and bmi were controlled by stratification. post stratification chi square test was applied. p value ≤ 0.05 was considered as statistically significant.

Results. During the specified period of my study, 70 patients were studied in two equal groups. Collectively the mean age and BMI was 41.29 ± 12.755 years and 26.80 ± 3.278 kg/m² respectively. The female gender was dominant as 70% cases were females. The prolonged ileus and hematoma formation were evident in 51.4%.

There was no difference between groups in terms of age, gender and BMI distribution as p values were 0.382, 0.794 and 0.942 respectively. The prolonged ileus and hematoma formation were statistically significant among groups. The group B has more frequency of prolonged ileus and hematoma formation as compared to group A (p values 0.004 and 0.017 respectively).

The data was stratified according to age, gender and BMI. The results showed that difference in frequency of prolonged ileus remained significant among groups for age >40, female gender and BMI >27 kg/m² (p values 0.005 and 0.007 respectively). The frequency of hematoma formation was significant among groups for age >40 and male gender (p values 0.031 and 0.049 respectively).

Table I

Quantitative variables among groups

| Quantitative variable | Groups | | P value ¹ |
|--------------------------|----------------|----------------|----------------------|
| | A N=35 | B N=35 | |
| Age (years) | 39.94 ± 12.257 | 42.63 ± 13.276 | 0.382 |
| BMI (kg/m ²) | 26.77 ± 3.431 | 26.83 ± 3.167 | 0.942 |

Table II

Distribution of gender among groups

| Gender | Groups | | P value ² |
|--------|------------|------------|----------------------|
| | A | B | |
| Male | 11 (31.4%) | 10 (28.6%) | 0.794 |
| Female | 24 (68.6%) | 25 (71.4%) | |

¹ Independent sample t test

² Chi square test

Table III

Prolonged ileus and hematoma formation among groups

| Outcome variable | | Groups | | P value ³ |
|--------------------|-----|------------|------------|----------------------|
| | | A | B | |
| Prolonged ileus | Yes | 12 (34.3%) | 24 (68.6%) | 0.004 |
| | No | 23 (65.7%) | 11 (31.4%) | |
| Hematoma formation | Yes | 13 (37.1%) | 23 (65.7%) | 0.017 |
| | No | 22 (62.9%) | 12 (34.3%) | |

Table IV

Outcome variable among groups for age <40 years

| Outcome variable | | Groups | | P value ⁴ |
|--------------------|-----|------------|------------|----------------------|
| | | A | B | |
| Prolonged ileus | Yes | 08 (50%) | 12 (70.6%) | 0.226 |
| | No | 08 (50%) | 05 (29.4%) | |
| Hematoma formation | Yes | 06 (37.5%) | 10 (58.8%) | 0.221 |
| | No | 10 (62.5%) | 07 (41.2%) | |

Table V

Outcome variable among groups for age >40 years

| Outcome variable | | Groups | | P value ⁵ |
|--------------------|-----|------------|------------|----------------------|
| | | A | B | |
| Prolonged ileus | Yes | 04 (21.1%) | 12 (70.6%) | 0.005 |
| | No | 15 (78.9%) | 06 (29.4%) | |
| Hematoma formation | Yes | 07 (36.8%) | 13 (72.2%) | 0.031 |
| | No | 12 (63.2%) | 05 (27.8%) | |

Table VI

Outcome variable among groups for male group

| Outcome variable | | Groups | | P value ⁶ |
|--------------------|-----|------------|------------|----------------------|
| | | A | B | |
| Prolonged ileus | Yes | 05 (45.5%) | 07 (70.0%) | 0.256 |
| | No | 06 (54.5%) | 03 (30.0%) | |
| Hematoma formation | Yes | 02 (18.2%) | 06 (60.0%) | 0.049 |
| | No | 09 (81.8%) | 04 (40.0%) | |

Table VII

Outcome variable among groups for female group

| Outcome variable | | Groups | | P value ⁷ |
|--------------------|-----|------------|------------|----------------------|
| | | A | B | |
| Prolonged ileus | Yes | 07 (29.2%) | 17 (68.0%) | 0.007 |
| | No | 17 (70.8%) | 08 (32.0%) | |
| Hematoma formation | Yes | 11 (45.8%) | 17 (68.0%) | 0.117 |
| | No | 13 (54.2%) | 08 (32.0%) | |

³ Chi square test⁴ Chi square test⁵ Chi square test⁶ Chi square test⁷ Chi square test

Table VIII

Outcome variable among groups for BMI <27 kg/m²

| Outcome variable | | Groups | | P value ⁸ |
|--------------------|-----|------------|------------|----------------------|
| | | A | B | |
| Prolonged ileus | Yes | 08 (42.1%) | 13 (65.0%) | 0.152 |
| | No | 11 (57.9%) | 07 (35.0%) | |
| Hematoma formation | Yes | 07 (36.8%) | 13 (65.0%) | 0.079 |
| | No | 12 (63.2%) | 07 (35.0%) | |

Table IX

Outcome variable among groups for BMI >27 kg/m²

| Outcome variable | | Groups | | P value ⁹ |
|--------------------|-----|------------|------------|----------------------|
| | | A | B | |
| Prolonged ileus | Yes | 04 (25.0%) | 11 (73.3%) | 0.007 |
| | No | 12 (75.0%) | 04 (26.7%) | |
| Hematoma formation | Yes | 06 (37.5%) | 10 (66.7%) | 0.104 |
| | No | 10 (62.5%) | 05 (33.3%) | |

Discussion. The abdominal wall hernias are one to most common surgical problems all over the world. The female gender is more effected when the hernia is around the umbilicus and male gender has inguinal hernia as most common form of hernias. With the advent of minimally invasive surgical techniques the hernial surgery has also been evolved over the time [7, 8]. The open technique is classic one and introduction of polypropylene mesh has revolutionized the repair [4, 5, 9]. The laparoscopic repair (LR) of hernia is associated with reduced pain, hospital stay and reduced infection rate [10]. The hernial defect which is smaller than 3 cm are more suitable for the LR. The complex hernias or hernia with larger defect are more suitable for open repair. The laparoscopic approach is excellent for the small hernias to reduce morbidity [11, 12].

Mason, R. J., et al. (2011) compared open and laparoscopic techniques of hernial repair in terms of short-term morbidity and mortality. The results showed that morbidity of various hernial types was less in LR as compared to open repair i.e. umbilical (1.9% vs. 3.0%, P = 0.009), ventral (3.9% vs. 6.3%, P < 0.0001) and incisional (4.3% vs. 9.1%, P < 0.0001) for LR and open repair respectively [13]. Moreover, the LR is associated with low recurrence, infections and reduced postoperative pain [1, 14]. The main drawbacks associated with LR is longer learning curve and longer operative times. The respiratory and cardiac complications are more in LR group due to hemodynamic changes during pneumoperitoneum [7]. The comorbid conditions like congestive heart failure, pulmonary circulation disorders and paralysis are considered mortality predictors in LR.¹⁵ The incisional hernia is one of the varieties in which the surgery is not feasible as compared to primary hernias. The incarceration, adhesions make it more difficult to handle. The recurrence is due to improper repair and peroperative nonidentification of secondary defects. The recurrence rate with LR is less as compared to open repair of incisional hernias [2]. While some studies show that there is no difference between recurrence rates in open versus laparoscopic repairs [1]. As for the cost analysis is concerned, the open repair temporarily seems less costly but due to increased chances of perioperative complications the final cost of open repair is greater than LR [3].

Malik, A. M. (2015) compared open and LR of paraumbilical hernias in terms of various outcomes [6]. As compared to my study, this study had larger sample size of 337 patients. The overall mean age of the study sample was 42.18 ± 9.789 years which was comparable to my study in which the mean age was 41.29 ± 12.755 years. My study has 70% female patients while above study has 79.82% female patients. The prolonged ileus and hematoma formation were significantly less in LR as compared to open repair in this study i.e. 7.25% versus 32.43% (p <0.001) and 1.61% versus 23.64% (p value <0.001) for prolonged ileus and hematoma formation respectively. In my study the respective values were 34.3% versus 68.6% (p value 0.004) and 37.1% versus 65.7% (p value 0.017). In contrast, A study in 2017 showed that for PUH repair, postoperative pain and hospital stay is reduced in LR group as compared to open repair. The hematoma formation, seroma and wound infections are less in LR group and but the difference is not statistically significant [16].

⁸ Chi square test

⁹ Chi square test

The data was stratified according to age, gender and BMI. The results showed that difference in frequency of prolonged ileus remained significant among groups for age >40, female gender and BMI >27 kg/m² (p values 0.005 and 0.007 respectively). The frequency of hematoma formation was significant among groups for age >40 and male gender (p values 0.031 and 0.049 respectively).

Conclusion.

The laparoscopic approach for ventral abdominal hernias is associated with reduced frequency of hematoma formation and prolonged ileus. Large sample size studies on larger scale would help to validate the results of my study.

Compliance with ethical standards

Conflict of interest.

There is no conflict of interest. But study was conducted during last appointment.

Informed consent.

Informed consent was taken from all patients for this study.

Acknowledgment.

None

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