Journal of Clinical and Nursing Research, 2024, Volume 8, Issue 4
http://ojs.bbwpublisher.com/index.php/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

Analysis of the Effect and Efficiency of Tension-Free Hernia Repair and Traditional Surgery in The Treatment of Hernia

Jiangtao Wang*

Chengjitou Township Hospital, Xindu District, Xingtai 054014, Hebei Province, China

***Corresponding author:** Jiangtao Wang, cjtshiyanfang@163.com

Abstract: *Objective:* To analyze the efficiency of tension-free hernia repair and traditional surgery in the treatment of hernia. *Methods:* A total of 80 patients with hernias were selected and randomly into a control group (traditional hernia repair) and an observation group (tension-free hernia repair), of 40 cases each. The perioperative indicators, pain, physiological stress indicators, complications, and recurrence rates between the two groups were compared. *Results:* The perioperative indexes of the observation group were better than those of the control group ($P < 0.05$). The postoperative pain score, postoperative physiological stress index level, incidence of complications, and recurrence rate of the observation group were lower than those of the control group ($P < 0.05$). *Conclusion:* In the surgical treatment of hernia, tension-free hernia repair was less traumatic and had a better effect than traditional hernia repair.

Keywords: Hernia; Traditional hernia repair; Tension-free hernia repair

Online publication: April 24, 2024

1. Introduction

Hernia is a disease that frequently requires surgery. Organ tissues such as the abdominal midgut tube protrude outward through a hole in the abdominal wall and gradually form a mass on the surface of the affected area. There are different types of hernia, including incisional hernia and umbilical hernia, with inguinal hernia being the most common. An inguinal hernia refers to the hernia protruding from the inguinal area. In the early stage, the hernia sac is prolapsed in the standing position. After taking the supine position, it will return to the abdominal cavity on its own. However, the feeling of the bulge is obvious, but has no great influence on daily life [1]. With the development of the disease, the hernia sac gradually increases, forming incarceration, and does not return to the abdominal cavity on its own. This results in blood circulation disorders causing intestinal obstruction, and may even be life-threatening [2]. The main method of clinical treatment of hernia is surgery. This study analyzes the application effect of tension-free hernia repair and traditional surgery in the treatment of hernia surgery in 80 patients.

2. Materials and methods

2.1. Data

Eighty patients with hernias admitted to the hospital from January to October 2023 were included in this study. They were divided into two groups according to different treatment methods, with 40 cases in each group. The control group consisted of 26 males and 14 females aged 25–71 years old, with an average age of 59.45 ± 5.18 years. There were 28 cases of indirect inguinal hernia and 12 cases of direct inguinal hernia. The observation group consisted of 27 males and 13 females aged 26–73 years old, with an average age of 59.30 ± 5.11 years. There were 27 cases of indirect inguinal hernia and 13 cases of direct inguinal hernia. The data of the two groups were compared ($P > 0.05$).

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) Patients diagnosed with hernia confirmed by abdominal computed tomography (CT) or B ultrasound; (2) patients with initial onset; (3) conform to the corresponding surgical indications; (4) patients with complete clinical information. Exclusion criteria: (1) Patients unable to undergo surgery due to weak physical function; (2) patients with coagulation dysfunction; (3) patients with mental illness; (4) participated in other medical research projects.

2.3. Method

The control group received traditional hernia repair. Before the operation, relevant examinations were performed and the incision position was marked in advance. During the operation, routine disinfection was performed and the supine position was taken. Continuous epidural anesthesia was performed. After the anesthesia took effect, the incision was taken at the inguinal hernia position, and the skin and subcutaneous tissue were cut in turn. The external oblique aponeurosis was cut, separated layer by layer, and the spermatic cord was freed to expose the entire hernia sac. Combined with the size of the hernia sac and other factors, direct reduction treatment was performed, or the ligation was cut and then reset. After the hernia sac was reset, the incision was sutured, and the operation was completed after routine treatment. Anti-infective treatment was given to keep the incision dry. The patient was instructed not to force the abdomen for one month after the operation and to partake in strenuous activity for three months.

The observation group received tension-free hernia repair. Preoperative examination, preparation, and intraoperative anesthesia were the same as those in the control group. The incision was taken at the position of the inguinal hernia, the external oblique fascia was cut directly, separated layer by layer, the spermatic cord was dissociated, the hernia sac was reset, and then the cremaster muscle was cut. The absorbable suture was used to fix the lower patch in the inner ring position. After that, the upper patch was fixed in the pubic tubercle and the middle of the transversus abdominis muscle. After fixation, the spermatic cord was placed on the surface of the patch, the incision was sutured, and the bleeding was stopped. The postoperative operation was the same as that of the control group.

2.4. Observation indicators

The perioperative indexes of the two groups were compared, including operation time, intraoperative blood loss, postoperative bowel sound recovery time, postoperative anal defecation time, eating time, and hospitalization time. The pain scores were compared. The visual analogue scale (VAS) was evaluated once before the operation, on the first day after the operation, and on the third day after the operation [3]. It was scored from 0–10 points. The higher the score, the greater the pain. Physiological stress indicators between the two groups were compared and fasting venous blood (10 mL) was collected. The levels of adrenaline and

cortisol were determined by chemiluminescence immunoassay, and the level of norepinephrine was determined by high-performance liquid chromatography (HPLC). Lastly, the statistics of postoperative complications and recurrence rate within 1 year were compared.

2.5. Statistical methods

The data were analyzed by the SPSS 25.0 statistical software. The measurement data conformed to the normal distribution and were expressed as mean ± standard deviation. The measurement data were compared using the t-test. count data were expressed as % and analyzed using a chi-squared (χ^2) test. Results were considered statistically significant at $P < 0.05$.

3. Results

3.1. Comparison of perioperative indicators

As shown in **Table 1**, the perioperative indicators in the observation group were better than those in the control group ($P < 0.05$).

Table 1. Perioperative indicators between the two groups (mean ± standard deviation)

Group	Cases, *n*	Operation time (h)	Intraoperative blood loss (mL)	Bowel sound recovery time (d)	Anal defecation time (d)	Eating time (d)	Length of hospitalization (d)
Control group	40	58.30 ± 8.17	36.15 ± 6.28	1.63 ± 0.28	1.91 ± 0.46	1.75 ± 0.48	6.81 ± 1.23
Observation group	40	52.30 ± 7.24	30.24 ± 5.19	1.10 ± 0.32	1.37 ± 0.41	1.18 ± 0.35	4.90 ± 1.12
t	-	3.476	4.588	7.883	5.542	6.068	7.262
P	-	0.001	0.000	0.000	0.000	0.000	0.000

3.2. Comparison of pain scores

As shown in **Table 2**, the preoperative pain scores of the two groups before the surgery were not significantly different ($P > 0.05$). The pain scores of the observation group on the first day and third day after surgery were lower than those of the control group ($P < 0.05$).

Table 2. Pain scores between the two groups (mean ± standard deviation)

Group	Cases, *n*	Before surgery	The first day after surgery	The third day after surgery
Control group	40	4.49 ± 0.53	2.86 ± 0.39	1.53 ± 0.48
Observation group	40	4.53 ± 0.48	2.10 ± 0.22	1.01 ± 0.30
t	-	0.354	10.735	5.810
P	-	0.724	0.000	0.000

3.3. Comparison of physiological stress indicators

As shown in **Table 3**, there was no significant difference in the levels of stress indexes between the two groups before operation ($P > 0.05$). The results 24 hours after the operation showed that the levels of the two groups were higher than those before the operation, where the levels of stress indexes in the observation group were lower than those in the control group ($P < 0.05$).

Table 3. Physiological stress indicators between the two groups (mean ± standard deviation)

Group	Cases, *n*	Epinephrine (ng/L)		Cortisol (nmol/L)		Noradrenaline (ng/L)	
		Preoperative	24 hours after surgery	Preoperative	24 hours after surgery	Preoperative	24 hours after surgery
Control group	40	55.05 ± 3.36	67.42 ± 3.28	253.54 ± 22.18	513.65 ± 22.17	465.75 ± 19.27	548.67 ± 16.39
Observation group	40	55.14 ± 3.28	61.45 ± 3.18	254.17 ± 23.64	489.45 ± 21.15	467.05 ± 20.16	517.96 ± 18.24
t	-	0.121	8.265	0.123	4.995	0.295	7.921
P	-	0.904	0.000	0.902	0.000	0.769	0.000

3.4. Comparison of incidence of complications and recurrence rate

As shown in **Table 4**, the incidence of complications and recurrence rate in the observation group were lower than those in the control group ($P < 0.05$).

Table 4. Incidence of complications and recurrence rate between the two groups [*n* (%)]

Group	Cases, *n*	Infection	Local edema	Scrotal effusion	Total complications	Recurrence rate
Control group	40	2 (5.00)	3 (7.50)	3 (7.50)	8 (20.00)	4 (10.00)
Observation group	40	0 (0.00)	1 (2.50)	1 (2.50)	2 (5.00)	0 (0.00)
χ^2	-	-	-	-	4.114	4.211
P	-	-	-	-	0.043	0.040

4. Discussions

The most common type of hernia is inguinal hernia. The human groin is a complex structure composed of the abdominal wall, fat, blood vessels, and muscles. The abdominal wall is generally weak, including the muscle fascia layer and skin fat layer. An inguinal hernia occurs when the contents of the abdominal cavity protrude from the weak part of the abdominal wall. The incidence of hernia is higher in men and the elderly [4]. The reason is that with the increase of age, the body function starts to decline, the abdominal wall muscles become more relaxed, and the drooping internal organs are not well supported. Therefore, the incidence of hernia is increases with age [5]. The occurrence of the disease is related to long-term constipation, chronic cough, and excessive fatigue. According to the state of the contents, inguinal hernia can be divided into four types. Among them, strangulated hernia and incarcerated hernia can lead to abdominal colic, accompanied by vomiting, constipation, and even intestinal obstruction or intestinal necrosis [6,7].

Surgery is the main method for the treatment of hernia. With the development of medical technology, more treatment methods have arisen, such as traditional ligation, plain film tension-free hernia repair, and hernia ring filling. In the past, traditional hernia repair was used to treat hernia. During the operation, the hernia sac was freed and high ligation was performed, and the tissue was returned to the abdominal cavity. After that, the inguinal wall was repaired and the hernia sac was reset. It has a certain effect, but the incision is relatively large. As a direct tissue suture method, not only does it cause a large amount of bleeding during the operation but also causes great pain after the operation. This could hinder recovery and the recurrence rate is also high [8–10]. Tension-free hernia repair is based on the anatomy of the inguinal hernia. Artificial materials are used to improve the posterior wall of the inguinal canal. The comprehensive anatomical hierarchy method is adopted in the repair, which does not affect the body tissue and also meets the actual physiological needs of the human body [11]. Compared with traditional hernia repair, it not only has less separation but also has less postoperative pain and faster recovery

[12]. A total of 80 patients were included in this study who were divided into two groups of 40 patients each. The observation group was treated with tension-free hernia repair, and the control group was treated with traditional hernia repair. The results showed that the intraoperative indexes and postoperative recovery indexes of the observation group were more ideal. The data showed that the observation group had less trauma and was more conducive to postoperative recovery. The postoperative pain score of the observation group was also lower. Surgery inevitably causes a physiological stress response. The results showed that the levels of physiological stress indexes in both groups increased after the operation, with a lower increase in the observation group. It can be seen that the operation in the observation group can reduce stress trauma. The incidence of complications and recurrence rate in the observation group was lower. The reason is that the artificial polymer mesh used in the observation group can make the abdomen more balanced and more comfortable. The traditional tissue overlapping suture method affects postoperative recovery, and the tension-free hernia repair avoids the above shortcomings [13,14].

5. Conclusion

In the surgical treatment of hernia, tension-free hernia repair was more reliable than that of traditional surgery. Hence, it is worthy of promotion.

Disclosure statement

The author declares no conflict of interest.

References

[1] Huang X, 2023, Analysis of the Causes and Treatment of Chronic Pain after Traditional Hernia Repair and Tension-Free Hernia Repair. Application of Modern Medicine in China, 17(5): 53–55.

[2] Wang G, Du Q, Fan L, 2022, The Application Value of TAPP and Open Tension-Free Hernia Repair in The Treatment of Inguinal Hernia. Laboratory medicine and clinical, 19(7): 913–917.

[3] Huang C, Wu Y, Liu X, 2021, Clinical Efficacy and Safety Evaluation of Tension-Free Hernia Repair and Laparoscopic Total Extraperitoneal Hernia Repair in The Treatment of Inguinal Hernia in The Elderly. Chinese Medical Journal, 56(4): 439–442.

[4] Lu C, Liu Li, Wang Y, et al., 2021, Comparative Analysis of Clinical Prognosis of Laparoscopic Transperitoneal Hernia Repair and Hernia Ring Filling Tension-Free Repair in The Treatment of Adult Inguinal Hernia. Chinese Medical Journal, 18(26): 121–124.

[5] Meng J, Huang H, Zhu G, 2023, Analysis of the Factors Affecting the Therapeutic Effect, Prognosis and Pain of Different Surgical Methods for Inguinal Hernia. Journal of Clinical Surgery, 31(4): 368–371.

[6] Liu W, Shen G, Gao Q, et al., 2023, Comparison of Totally Extraperitoneal Laparoscopic Hernia Repair and Open Surgery for Female Inguinal Hernia. Chinese Journal of Minimally Invasive Surgery, 23(5): 354–358.

[7] Wu C, Lin H, 2023, The Effect of PKURP Combined with TEP on the Treatment of Benign Prostatic Hyperplasia Complicated with Inguinal Hernia in The Elderly. Chinese Journal of Geriatrics, 43(13): 3152–3155.

[8] Zhang M, Wu Y, Zhong F, et al., 2023, Comparison of the Efficacy of Laparoscopic Extraperitoneal Hernia Repair and Transperitoneal Preperitoneal Hernia Repair in The Treatment of Unilateral Primary Inguinal Hernia in Adults. Chinese Medical Journal, 20 (10): 84–87 + 99.

[9] Issa M, Tacey M, Geraghty J, et al., 2021, Cyanoacrylate Glue Versus Absorbable Tacks in Mesh Fixation for

Laparoscopic Extraperitoneal Inguinal Hernia Repair: A Randomized Controlled Trial. Surgical Laparoscopy, Endoscopy, and Percutaneous Techniques, 31(3): 291–297.

[10] He W, Peng C, 2023, Clinical Effect Observation of Laparoscopic Transabdominal Inguinal Hernia Patch Repair in The Treatment of Occult Inguinal Hernia. Practical Hospital Clinical Journal, 20(1): 150–152.

[11] Li J, Guo J, Li H, 2022, Risk Assessment and Treatment of Postoperative Deep Venous Thrombosis in Patients with Inguinal Hernia. Thrombosis and Hemostasis, 28(2): 292–293.

[12] Hu L, Wang G, Wu Q, 2023, Comparison of the Efficacy of TEP, TAPP, and Open Hernia Repair in The Treatment of Inguinal Hernia in The Elderly. Geriatric Medicine and Health Care, 29(4): 802–807.

[13] Giddings HL, Fenton-Lee D, 2021, Australian General Surgical Trainee Experience with Inguinal Hernia Surgery: A Review of International Training Programmes and The Learning Curve. ANZ Journal of Surgery, 91(6): 1138–1142.

[14] Hu Z, 2023, Comparative Analysis of The Clinical Effects of Laparoscopic Preperitoneal Inguinal Hernia Repair and Laparoscopic Total Extraperitoneal Inguinal Hernia Repair in The Treatment of Inguinal Hernia. Journal of Clinical Surgery, 31(3): 264–266.