MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2014.150.154

Gilbert Rutkow Mesh Plug Repair of Inguinal Hernia: A Teaching Hospital Based Study

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ABSTRACT

Hernia repair is a frequently conducted surgical operation on a global scale. Advancements in surgical methods, along with the advancement of novel materials for prosthetics and a deeper comprehension of their use, have greatly enhanced results for several patients. During our examination of prosthetic repair methods, we analyzed the Rutkow-Robbins Repair (Group A) the Gilbert double Repair (Group B) and the Lichtenstein procedure (Group C). In the upcoming study, a total of 110 cases were included, including 35 instances in group A, 20 cases in group B and 55 cases in group C, respectively. All cases were monitored for a duration of eighteen months. In this research, among a total of 110 patients, 60 (63.1%) patients had right indirect inguinal hernia, 30 (31.6%) patients had left indirect inguinal hernias and 10 (10.5%) patients had bilateral inguinal hernias. Based on the data provided, it is evident that there is a much larger occurrence of right-sided indirect inguinal hernias compared to left-sided indirect inguinal hernias and bilateral inguinal hernias. These results indicate that the Lichtenstein procedure is more beneficial than other surgeries since it requires less time in the hospital, has a lower rate of complications, and allows for a quicker return to everyday activities. Thus, the Lichtenstein technique is considered the most beneficial approach for repairing inguinal hernias.

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Key Words

Lichtenstein procedure, inguinal hernias, gilbert-rutkow mesh plug

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Received: 5 August 2014
Accepted: 25 August 2014
Published: 20 November 2014

Citation: Sanjiv Suri and Pankaj Kapoor, 2014. Gilbert-Rutkow Mesh Plug Repair of Inguinal Hernia: A Teaching Hospital Based Study. Res. J. Med. Sci., 8: 150-154, doi: 10.59218/makrjms.2014.150.154

INTRODUCTION

In humans, the vertical position of the body causes the force of gravity to be transmitted to the lower abdominal wall. Moreover, the inguinal canal is oriented downwards, and the intraabdominal contents exerting pressure on its internal entrance have a tendency to widen it and result in the loops of bowel entering the canal[1]. About 12,000 hernia surgeries are carried out in Finland, while in England and the USA, approximately 80,000 and 800,000 operations are performed, respectively. The exact occurrence is still uncertain, however it affects approximately 4-7% of men[2]. As people get older, there is a higher occurrence of hernias, more instances of strangulation, and longer hospital stays[3]. Although the exact cause is still not known, the development of this condition is believed to be influenced by factors such as the openness of the processus vaginalis, genetic inheritance, and an upright posture[4]. At present, surgery is used to treat hernia. Hernia surgeries make for 10-15% of all general surgery procedures.[5] Tension-free repairs are the most often favored operational procedures when considering recurrence and complication rates. The Lichtenstein procedure and its variations, such as Gilbert and Rutkow-Robbins, are known to be anterior approaches that are tension-free. These approaches have been reported to result in very low rates of recurrence and complications[6,7]. In addition the fact that certain procedures can also be done using local anesthetic instead of general or spinal anesthesia offers another benefit. We aimed to compare the Lichtenstein technique with the Rutkow-Robbins and Gilbert double layer techniques in inguinal hernia repair. We focused on factors such as operation length, postoperative pain, early and late complications, length of hospital stay, recurrence rates, and time required to return to work.

Different surgical methods have been employed ranging from traditional to minimally invasive procedures-in order to improve outcomes in terms of reduced pain after surgery, faster recovery, and lower chances of recurrence. In 1986, Lichtenstein used the term “tension-free” to describe his repair approach, which involves reinforcing the fascia transversalis with a polypropylene mesh[8]. It is the most popular method in the UK, as it provides an efficient fix and is simple to carry out[9]. Recently, there has been an increasing interest in mesh plug hernioplasty. In the United States, this method has been widely employed in certain facilities with favorable outcomes[10]. It is a simpler process compared to Lichtenstein’s method, where a polypropylene mesh plug is put at the defect site, similar to a cork stopper in a bottle[11]. In this study, we selected this particular repair to determine if the surgical results aligned with the documented outcomes in our clinic and to confirm the assertion that it is a treatment that allows patients to return to work on the same day.Zero

In addition, the fact that certain procedures can also be carried out using local anesthetic instead of general or spinal anesthesia offers another benefit. In this study, our goal was to compare the Lichtenstein technique with the Rutkow-Robbins and Gilbert double layer techniques in repairing inguinal hernias. We looked at factors such as the duration of the operation, postoperative pain, flow velocity in the femoral vein, complications both early and late, recurrence rates, length of hospital stay, time taken to return to work, and cost analysis.

MATERIALS AND METHODS

The current study was carried out in the Department of Surgery at Icare Institute of Medical Sciences and Research and Dr. Bidhan Chandra Roy Hospital, Haldia, focusing on patients with Inguinal hernia who were admitted and underwent hernia repair at a hospital. From January 2018 to May 2019 (Prospective study), we excluded cases of inguinal hernia that were direct or indirect, reducible or irreducible, obstructed or strangulated, and recurrent. This was done to prevent any potential interference with the results of the study. During our examination of prosthetic repair methods, we analyzed the Rutkow-Robbins Repair (Group A), the Gilbert double Repair (Group B), and the Lichtenstein procedure (Group C). In the upcoming study, a total of 110 cases were included, including 35 instances in group A, 20 cases in group B and 55 cases in group C, respectively. All cases were monitored for a duration of eighteen months.

The plug mesh repair involves making a 2-inch incision in the groin area. The external oblique muscle is opened along the path of its fibers. The cord is untied and the indirect sac is pushed back into the abdominal cavity without opening the sac. The peritoneal sac is not tied. A plug is then placed in the deep ring and attached to the ring with prolene 2/0 interrupted stitches in 3-4 locations. In every instance, a lipoma of the cord, if it exists, is removed. In instances of direct hernia, the bottom of the abnormality is removed using electric cautery. The plug is then placed and fastened with 3-4 interrupted prolene stitches. An onlay mesh is inserted without being secured but the lateral split end is brought together with a single prolene stitch. The outer oblique is sutured with polysorb 2/0 and the skin is closed with subcuticular polysorb 3/0. When repairing a hernia that keeps coming back, the sac is released and pushed back into place via the edges of the opening, and a plug is put in to close the opening. The plug is then fastened with 3-4 interrupted prolene stitches.

Table 1: Shows the age distribution of all groups

	Group A		Group B		Group C	
Age group	No. of cases	percentage	No. of cases	percentage	No. of cases	percentage
16-25	2	5.7	0	0	3	5.4
26-35	3	8.5	2	10	4	7.2
36-45	13	37.1	3	15	7	12.7
46-55	14	40	5	25	17	30.9
56-65	3	8.5	7	35	19	34.5
66-75	0	0	3	15	5	9.0
Total	35		20		55	110

Table 2: Shows the side of hernia

	Group A		Group B		Group C	
Sides	No. of cases	percentage	No. of cases	percentage	No. of cases	percentage
Right side	22	62.8	12	60	32	58.1
Left side	10	28.5	4	20	17	30.9
Bilateral	3	8.5	4	20	6	10.9
Total	35		20		55	95

Table 3: Shows the Anaesthesia used during operation

Anaesthesia	No. of cases	percentage
General	9	8.1
Spinal/epidural	86	78.1
Local	15	13.6

Table 4: Demographics and clinical characteristics of patients

Variables	Group A	Group B	Group C	p -value
Operative time in minutes	53.3±11.1	61.4±13.1	53.5±11.4	0.001
Hospitalization time in days	3.4±0.68	3.04±0.25	3.07±0.4	0.63
Return to time in days	26.2±3.01	25.2 ±3.61	24.1 ± 3.4	0.37

Table 5: Shows the post operative systemic complication

Variables	Group A	Group B	Group C	p-value
Males	35	20	55	
Early Complications	6 (17.1%)	4 (20%)	2 (3.6%)	0.23
Late Complications	5 (14.2%)	6 (30%)	6 (10.9%)	0.65
Drain	3 (8.5%)	4 (20%)	9 (16.3%)	
	0.48			

RESULTS

The research was conducted on 110 individuals. All participants included in this study were male. The youngest individual was 17 years of age while the oldest individual was 75 years of age [Table 1]. The study was conducted on four groups, and the data collected indicates that the highest number of patients underwent surgery in the age range of 56-65 years. The minimum age requirement is 17 years, while the maximum age allowed is 75 years. The average age is 51.5 years.

In this research, among a total of 110 patients, 60 (63.1%) patients had right indirect inguinal hernia, 30 (31.6%) patients had left indirect inguinal hernias, and 10 (10.5%) patients had bilateral inguinal hernias. Based on the data provided, it is evident that there is a much larger occurrence of right-sided indirect inguinal hernias compared to left-sided indirect inguinal hernias and bilateral inguinal hernias.

Table 3 displays that 9 individuals, accounting for 8.1% of the total, underwent surgery with local anesthetic. Additionally, 86 individuals (78.1%) and 15 individuals (13.6%) underwent surgery with spinal anesthesia and general anesthesia, respectively.

Table 4 indicates that none of the three techniques exhibited a statistically significant difference in terms of Hospitalization time and return to normal activities ($p>0.05$). There was a statistically significant difference between the groups in terms of operation lengths ($p<0.05$).

Table 5 displays that the drain was utilized in a total of 17 patients, which accounts for 15.4% of the total. The data indicates that there was no statistically significant distinction between the groups ($p = 0.48$). Likewise, there was no notable distinction observed between the groups in terms of early or late problems ($p> 0.05$).

DISCUSSIONS

The most significant advancements have been observed mostly in facilities that specialize in hernia surgery, where certain institutions have reported failure rates of less than 1%. On the other hand, the failure rates for general surgeons, who are responsible for the majority of hernia repairs, continue to be noticeably higher. The effectiveness of groin hernia

repair is primarily assessed based on the long-term success of the procedure, the lowest number of problems the least expensive costs and the earliest resumption of regular activities. The achievement of this outcome relies heavily on the surgeon's comprehension of the structure and function of the operative region, as well as their expertise in utilizing the most efficient methods and resources now accessible[12]. Inguinal hernia surgeries remain a frequently performed procedure throughout a general surgeon's career. Although it is commonly observed, it is generally regarded as a straightforward procedure, given its anatomical planes.

At present, the effectiveness of the Shouldice procedure, which has been extensively researched and is considered a highly reliable method with low rates of recurrence, cannot be consistently replicated. The primary goal in tension-free restorations of inguinal hernias is to use a prosthetic material implant to provide a completely tension-free support and to strengthen the posterior wall of the hernia or potential hernia sites for long-term reinforcement. At present, specifically the repetitions during the first phase (first 2 years) are acknowledged to stem from the stress on the suture line. Initially, doctors attempted to utilize a relaxing incision but subsequently it was discovered that it had no impact on the issue. The concept of completely and permanently strengthening the back wall of the inguinal canal has gained popularity with Lichtenstein[13,14]. Lichtenstein reported a 0% recurrence rate in his study (1989) where 1,000 cases were treated with the onlay approach, and the findings got both unfavorable and good comments globally[15]. The results achieved by other clinics using the Lichtenstein onlay technique are in line with the outcomes of the Lichtenstein approach[16]. Recurrences following inguinal hernia repairs are divided into two groups early recurrences, which are mechanical and occur within the first two years after the procedure, and late recurrences, which are metabolic and occur several years after the operation. The early recurrences are attributed to the tension in the reinforced line, whereas the late recurrences are attributed to changes in the collagen metabolism of transverse fascia and comparable structures[17,18]. Some risks have been mentioned in the literature (although not often) with Rutkow-Robbins procedures because to reduced dissection, such as orchitis and nerve injury. Possible drawbacks may include the recurrence of pubic issues due to the use of a graft that does not extend over the pubis, as well as challenges in reinforcing the posterior wall caused by the shrinkage of the unsutured onlay graft. Hematoma was seen in the participants as an early complication in this investigation. No more issues were discovered throughout the early time. Hematoma had the highest occurrence in the Rutkow-Robbins group and the lowest in the Lichtenstein group. We think that the larger amount of drain utilization among patients in the Lichtenstein group was the reason for that significant difference. The most frequent issue observed during the later stages of patient monitoring was a lack of sensation in the area where the surgical incision was made, as well as the inside part of the leg. Isemeret. *et al*.[19] found that the occurrence of numbness in the thigh region was 2.4% following the Rutkow-Robbins procedure. An intriguing discovery was that the individuals who required frequent pain relievers were predominantly below the age of 50. The specific type of hernia did not affect the pain score after the operation, while younger patients experienced more discomfort. This age dependence has been demonstrated in various surgical collections. Forte *et al*.[20] performed a study and found that after the Lichtenstein operation, there was a 4.3% occurrence of numbness in the thigh region.

CONCLUSION

In summary, after examining the treatment of inguinal hernia from different perspectives and comparing three methods-Rutkow-Robbins Repair, Gilbert double Repair and Lichtenstein operation. These results indicate that the Lichtenstein procedure is more beneficial than other surgeries since it requires less time in the hospital, has a lower rate of complications and allows for a quicker return to everyday activities. Thus, the Lichtenstein technique is considered the most beneficial approach for repairing inguinal hernias. We expect that this finding will be strengthened by future investigations, which will involve larger series. Based on our experience, this method has been found to be straightforward and uncomplicated to execute. There is very little pain after surgery and it is common to start moving around and going back to work early. Thus, we suggest using it to treat both initial and recurring groin hernias.

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