

Comparison of inguinal hernia recurrence rate after mesh plus Bassini repair and mesh repair alone

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ABSTRACT

Background & Aims: One of the topics discussed in surgical medicine is the adoption of a selective method for repairing inguinal hernia. The recognition of the efficacy and complications of each repair method, especially in comparison with each other, can be greatly helpful in this domain. Regarding this, the present study aimed to compare the outcomes and complications of using mesh plus Bassini method and mesh repair alone in patients with inguinal hernia. **Materials and Methods:** This analytical cross-sectional study was conducted on 166 candidates of inguinal hernia surgery in 2007. The patients were divided into two groups based on the adopted surgical approach, namely Bassini plus mesh methods and mesh repair alone. The standard surgical protocol was performed by a surgeon using a prolene mesh with a size of 11×6 cm for both groups. The medical records of the patients were assessed after the surgery in terms of the length of hospital stay and recurrence rate for five years. Data analysis was performed using Fisher's exact and Chi-square tests to compare the ratios, as well as Student's t-test and Chi-square test at a significance level of 0.05. **Results:** Mean durations of hospital stay in the mesh plus Bassini and mesh groups were 1.9±0.8 and 2.1±0.9 days, respectively, which was not significantly different between the two groups (P=0.166). During the five-year follow-up, 2.4% and 10.8% of the patients in the mesh plus Bassini and mesh groups experienced hernia recurrence. Accordingly, there was a significant difference between the two groups in terms of this variable (P=0.029). **Conclusion:** As the results of the present study indicated, the concomitant use of Bassini and mesh methods in a surgery could significantly prevent the recurrence of inguinal hernia, compared to the exclusive use of mesh technique.

Keywords: Inguinal hernia, Bassini repair, Mesh repair

Introduction

Hernia means the rupture of a section of a building and offshoot in Latin and Greek languages, respectively. This condition is defined as a defect in the abdominal wall, which is large enough to allow the protrusion of the intraabdominal structures into the hernia sac ^[1]. Inguinal hernia is one of the most common causes of general surgery with a male to female

ratio of 7:1. The incidence of this condition increases by aging, especially after the age of 40 years ^[2, 3]. Based on the evidence, indirect inguinal hernia is the most common type of hernia both in males and females ^[4]. In this regard, 25% of men and 2% of women experience inguinal hernia during their lifespan. Generally, inguinal hernia occurs more commonly on the right side than the left side. This disease must be immediately treated after diagnosis ^[5]. There are no precise data on the prevalence of this condition. However, this health problem can affect all age groups and both genders. Based on the evidence, inguinal hernia is accompanied with some complications in 7-12% of adult cases ^[6].

Hernia is reducible if its contents can be manipulated back into the anatomic cavity; otherwise, the condition is irreducible. Moreover, hernia strangulation occurs in case of the disruption of the vascular supply to the hernia contents ^[7]. The present study aimed to evaluate the recurrence rate of inguinal hernia after using mesh plus Bassini methods and mesh repair alone in

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patients admitted to Sadr and Rasoul Akram hospitals in Tehran, Iran, during 2012-2017.

Materials and Methods

This analytical cross-sectional research was conducted on patients undergoing inguinal hernia repair and receiving a five-year followed-up in Sadr and Rasoul Akram hospitals during 2012-2017. The patients were divided into two groups based on the adopted surgical approach. In this regard, the first group encompassed patients treated with the concomitant use of Bassini plus mesh techniques, whereas the second group consisted of the subjects managed with only mesh repair.

The main variable investigated in the present research was the recurrence rate of inguinal hernia in both groups. In addition, the patients were compared in terms of age, gender, side of involvement, type of hernia, and length of hospital stay. The data were collected by completing a checklist based on the medical records of the patients. Data analysis was performed in SPSS (version 18) using Student's *t*-test and Chi-square test. It is notable that all stages of the study was conducted in accordance with the Declaration of Helsinki.

Results

Out of the 166 patients undergoing inguinal hernia repair in the investigated hospitals during 2012-2017, 92% of the subjects were male. Accordingly, the prevalence of inguinal hernia was 11 times higher in males, compared to that in females. Meanwhile, based on the global statistics, the prevalence of this condition has been reported as 25 times higher in males than in females^[3].

The lower inguinal hernia prevalence among the male patients in the present study than that presented by the global reports might be due to the non-referral of some males for receiving the associated treatments despite suffering from hernia for a long time. Another reason can be the higher prevalence of the disease in the females of the area under investigation. However, the confirmation of the mentioned causes requires the implementation of more extensive and complementary studies in this domain.

The mean ages of the patients in the mesh plus Bassini and mesh groups were 44.7 ± 17.4 and 49.4 ± 19.7 years, respectively ($P=0.106$). As the results indicated, the two groups were comparable in this respect.

In the present study, the right- and left-sided hernia cases were detected in 54% and 46% of the patients, respectively. The same statistics were obtained considering the prevalence of each affected side in men and women. However, in the literature, the prevalence of right-sided hernia has been reported to be two times higher than that of the left-sided one^[4], which is slightly lower than the rate presented by the global statistics. Nonetheless, this difference is not statistically significant. The higher prevalence of indirect right-sided inguinal hernia has been ascribed to the delay in the atrophy of

tunica vaginalis, which normally emerges due to the slower descent of the right testicle into the scrotum^[8].

In the current research, 83 repairs were performed using a combination of mesh and Bassini techniques, and 83 cases were exclusively managed with mesh repair. According to the results, the mesh plus Bassini and mesh groups had the recurrence rates of 2.4% and 10.8%, respectively. Based on multiple international studies, Bassini technique is the most commonly used surgical procedure (59%) in hospitals^[9]. It should be noted that Bassini repair does not normally involve the opening of the transversalis fascia. However, in the modified Bassini technique, transversalis fascia can be opened in the incision direction to be used as an additional layer for repair. As indicated in some studies, the implementation of this method has been accompanied with a decrease in the rate of recurrence.

In a number of investigations, the exclusive use of mesh repair has been reported to result in a recurrence rate of 3%, which is significantly lower than the rate obtained for Lichtenstein method^[10]. This might be due to the maintenance of transversalis fascia function in the former technique^[11]. Nonetheless, one of the major causes of recurrence is the non-fixation of the mesh onto the pubic tubercle. In other words, the lack of proper fixation of the mesh and its folding have been recognized as the main causes of recurrence^[10]. According to the literature, the recurrence rate of this method is below 1%^[12].

Lichtenstein method is a suitable technique for managing the recurrent hernia cases. It is notable that about 20% of the hernia surgeries performed in teaching hospitals are recurrent cases^[9]. However, the Stoppa method is often recommended for bilateral recurrent hernia^[13]. According to the statistics, about 46% of the recurrent cases are observed on the left side of the body.

Discussion and Conclusion

Various methods have been introduced to repair hernia, each of which has its own advantages and disadvantages. In general, the repair methods are divided into prosthetic and nonprosthetic categories. Furthermore, the incision and exploration of the surgical site are accomplished through two approaches, namely anterior and posterior^[14]. The nonprosthetic repair methods for the treatment of inguinal hernia include Marcy, Bassini, Moloney Darn, Shouldice, and McVay, which are performed using the anterior approach^[14].

On the other hand, the prosthetic repair methods for inguinal hernia include Lichtenstein, as well as mesh plug and patch, which are implemented via anterior approach similar to the mesh-free techniques^[14]. The methods performed through the posterior approach include Stoppa/Wantz and laparoscopic repair, in which the myopectineal orifice is strengthened with the aid of a mesh^[14]. The mesh-free repair methods for inguinal hernia have been reported to have a recurrence rate of 15%. These techniques are accompanied with intense pain. In the prosthetic repair method, this rate decreases to 4-5%, which is

considerable regarding the high incidence rate of hernia in the society ^[14].

The issue mostly discussed in repairing a recurrent inguinal hernia through the posterior approach is the anatomic change of the surgical site due to the former surgery. In this regard, the adhesion caused by the former operation prevents from the adequate exploration and complete dissection of the inguinal region. This significantly increases the incidence of complications and recurrence. One of the complications is testicular atrophy resulting from a damage to the artery ^[15]. Today, the production of synthetic meshes has increased the popularity of tension-free hernia repair with mesh as the golden standard method for groin hernia surgery ^[16].

Lichtenstein open mesh inguinal hernia repair is recognized as a simple and safe method with a high success and low recurrence. However, researchers are still seeking to reduce the complications and recurrence rate of surgical methods for inguinal hernia. In this respect, one of the approaches for reducing complications is the concomitant adoption of two repair methods. For instance, we can simultaneously use nonprosthetic and prosthetic techniques. One of the routine nonprosthetic methods is Bassini technique.

The Bassini method has been an important technique in the treatment of inguinal hernia due to its potentiality to significantly reduce the recurrence rate of this condition. The importance of Bassini repair lies in the model it has presented. This method involves the dissection of the spermatic cord and hernia sack, along with the closure of its neck and reconstruction of the floor of the inguinal canal, following the separation of the cremaster muscle and closure of the hernia sack at the depth of the internal inguinal ring.

Furthermore, in this method, transversalis fascia is incised from the internal ring laterally to the pubic tubercle, thereby entering the preperitoneal space. The preperitoneal fat is also bluntly dissected from the upper margin of the posterior side of transversalis fascia to facilitate tissue mobilization. Afterwards, the three-layer repair is carried out to maintain the integrity of the canal and fixate the internal tissues (e.g., internal oblique muscle, transverse abdominal muscle, and transversalis fascia) to the sloping edge of inguinal ligament and pubic tubercle using interrupted sutures ^[17].

Prior et al. investigated 38 and 42 patients treated by Bassini (mesh-free) and Lichtenstein (with mesh) techniques, respectively, to compare these methods. In the mentioned study, the mean durations of performing the Lichtenstein and Bassini methods were 26.8 and 27.5 min, respectively, which were not significantly different between the two groups ($P=0.76$).

Furthermore, they observed a significantly lower pain score in the Lichtenstein group, compared to that in the Bassini group ($P=0.028$). However, no significant difference was detected between the groups in terms of the amount of anesthetic drugs administered ($P=0.073$). In addition, there was no significant difference between the groups regarding the type of disability, urinary complications, and wound infection ^[14].

In another study performed by Malik et al. to compare mesh and mesh-free (Bassini) methods, the recurrence rate was significantly lower in the mesh group (2%), compared to that in the Bassini group (7.1%) during the three-year follow-up ($P<0.001$) ^[15]. Furthermore, in a study performed in Iran, Modares et al. (2012) compared the results of inguinal hernia repair between the mesh and non-mesh methods. To this end, they assessed a total of 132 patients (i.e., 129 males and 3 females) with a mean age of 53.66 ± 16.89 years. In total, 45 (34.1%) and 87 (65.9%) patients underwent herniorrhaphy via mesh and non-mesh methods, respectively.

In the mentioned study, the mean times to return to work were reported as 25.4 ± 4.7 and 28.53 ± 7.86 days in the patients receiving hernia repair in the mesh and non-mesh groups, respectively ($P=0.048$). During the follow-up, 8 (6.1%) subjects experienced recurrence, 6 cases of whom were treated with non-mesh method and 2 cases received mesh herniorrhaphy ($P>0.05$).

In a study carried out by Suradom et al. in 2011 to compare umbrella made-mesh plugs with Bassini and Lichtenstein methods, the mean duration of hospital stay was obtained as 3.5 days (range: 1-7 days). In terms of complications, ecchymosis and seroma were observed in 1, 3, and 3 patients managed with Lichtenstein method, Bassini repair, and Bassini plus umbrella made-mesh plug, respectively. During a two-year follow-up, the Bassini and Bassini plus umbrella made-mesh plug groups had the recurrence rates of 13.8% and 7.1%, respectively. However, they observed no case of hernia recurrence in the Lichtenstein and umbrella made-mesh plug groups ^[17].

Based on the findings, it could be concluded that inguinal hernia has a higher prevalence in the fifth decade of life. Furthermore, the prevalence of this condition is lower in male patients, compared to the rate presented by the global statistics. The equipment of the surgery assistants with the necessary knowledge in educational centers has led to the reduction of inguinal hernia recurrence rate in adults following the concomitant use of Bassini and mesh methods. Accordingly, this rate has approximated the rates reported in international studies. However, the exclusive use of mesh technique in hernia repair has a higher recurrence rate, compared to the global statistics. This highlights the importance of giving special attention to the education of clinical methods of hernia repair to the surgery assistants in the educational centers.

Research Limitations

One of the major drawbacks of the study was the need to follow up patients for five years after discharge, which was managed with the help of other surgery residents in the hospital and through using the information recorded on the patients' medical files.

References

1. Condon RE. The anatomy of the inguinal region and its relation to the groin hernia, in Nyhus LM, Condon RE (eds): *Hernia*, 3rd ed. Philadelphia: JP Lippincott, 1989, p 18.
2. MacFadyen BV, Mathis CR. Inguinal Herniorrhaphy: Complications and Recurrences. *Surgical Innovation* 1994; 1(2): 128-140.
3. Nyhus LM, Coclon RE, Judge C, Rhoads JE. *Hernia*. 3rd edition. Philadelphia: J.B. Lippincott, 1989.
4. Eubanks WS, Hern IU, Townsend CM, Beauchamp RD, Evers BM, Mattox KL. *Sabiston Textbook of surgery the biological basis of modern surgical practice*. 16th edition. Philadelphia: W.B. Saunders 2001, p.783-802.
5. Nilsson E, Kald A, Anderberg B, Bragmark M, Fordell R. et al. Hernia surgery in a defined population: a prospective three year audit. *Eur J Surg* 1997 Nov; 163(11): 823-9.
6. Simons MP, Vos PM, van Geldere D, Hoitsma HF, Obertop H. More recurrences than expected following inguinal hernia surgery. *Ned Tijdschr Geneesk* 1996 Dec 14; 140(50): 2506-9.
7. Kaiwa Y, Namiki K, Matsumoto H. Laparoscopic relief of reduction en masse of incarcerated inguinal hernia. *Surg Endosc* 2003 Feb; 17(2):352.
8. Rutkow IM, Open versus Laparoscopic groin herniorrhaphy: Economic realities, In: Arreyui M E.Nagan R F, *Inguinal hernia: Advances or contraversies ?* Oxford, Raddiffe Medical, 1994.
9. Weber TR, Tracy TF, Groin hernias and hydrocels, In: Accraf R, T Murphy, J P Sharp R J, Sigalet D L, Snyder C L. *Pediatric Surgery*, 3rd ed. Philadelphia: W.B. Saunders, 2000. p654-63.
10. Mattioli F, Puglisi M, Priora F, Mille F, Butter P. Treatment of inguinal hernia: a prospective study comparing Basins procedure the inguinal preperitoneal prosthesis and the Lichtenstein technique. *Chiv Ital* 2002 May –Jun, 54 (3)3:7-21.
11. Egiev V N, Titora G P, Shurygin S N, Chizhov D V. Complications of Lichtenstein's plastic reconstruction of inguinal canal. *Hirurgiia(MOSK)* 2002 (7): 37-40.
12. Huang C S. Surgical treatment of recurrent groin hernia. *J Formos Med Assoc* 1999 Feb 98 (2):122-7.
13. Fernández-Lobato R1, Tartas-Ruiz A, Jiménez-Miramón FJ, Marín-Lucas FJ, de Adana-Belbel JC, Esteban ML. Stoppa procedure in bilateral inguinal hernia. *Hernia*. 2006 Apr;10(2):179-83
14. Vadmin S, Macho J , Charles B, *Schwartz Principles of Surgery*, McGraw-Hill: 2010,1305-1340
15. Nicolo E, Nadey S, *Surgical Complications*, Imperial College Press 2007,493-504.
16. Kugel RD. Minimally invasive, nonlaparoscopic, preperitoneal, and sutureless, inguinal herniorrhaphy. *Am J Surg* 1999;178(4):298-302.
17. Fitzgibbons RJ, Filippi CJ, Quinn TH. Inguinal hernias. In: Brunicaud C, Anderson D, Dune D, Hunter J, Pollak R, editors. *Schwartz's Principles of Surgery*. 8th ed. Texas: McGraw-Hill; 2005. p. 1353-90.