

## Comparison of Bassini and Shouldice Surgery Methods in the Inguinal Hernia Surgery in Terms of Relapse and Pain Rate

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### ABSTRACT

**Background:** Inguinal hernia repair has been the basis of surgery. Recurrence of a hernia is important because it can be associated with the same complications of the early illness. The causes of disease recurrence include wound infection, inappropriate surgical technique, inability to repair the inner ring, hernia stuck, increased intraabdominal pressure, connective tissue disease, and inadequate and incomplete suture of hernia sac.

**Aim:** To investigate the rate of recurrence and pain after inguinal hernia surgery has not been performed in both Bassini and Shouldice methods.

**Methods:** This prospective analytical study was done on all candidates for the inguinal hernia repair, Zahedan, Iran, 2016.

**Methods and Material:** The data collection was done from medical records and clinical examinations of patients. After collecting necessary data, the data were analysed Chi-square by SPSS-21 statistical software. **Results:** There wasn't a significant difference between the pain intensity in the two surgical methods after 6 and 24 hours after surgery ( $p=0.952$  and  $p=0.676$ , respectively). Chi-square test showed no significant difference in the recurrence rate of the disease in two surgical methods ( $P=0.554$ ).

**Conclusions:** The results of present study show both Bassini and Shouldice methods have similar effects and recurrences, also both methods can be used to repair an inguinal hernia.

**Keywords:** Bassini, Shouldice, Inguinal hernia repair

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### INTRODUCTION

The abdominal wall and pelvic floor are anatomically composed of different layers including muscles and retaining tissue or fascia. If these muscles and fascia are loosened due to genetic factors or excessive pressure, it causes a bump (bulge) in the area of the skin called the hernia<sup>1</sup>.

Most of the abdominal wall hernia occur in the groin area, which generally accounts for 75% of the total. It is difficult to determine the exact incidence of inguinal hernia in the general population, but most of these hernia occur in men. Twenty five percent of men and only 2% of women experience inguinal hernia during their lives<sup>2</sup>. This disease is important because it can be associated with potentially serious complications, such as sticking viscera in the hernia sac. If left unset and untreated, it can cause damage to the viscera, perforation and gangrene of the intestines and peritonitis and death of the patient. Hence, surgical and therapeutic intervention should be performed immediately after the diagnosis of inguinal hernia<sup>3,4</sup>.

Inguinal hernia repair has been the basis of surgery, and is one of the most commonly used surgeries in the United States, which is attributed to its high incidence throughout life and the variety of successful therapeutic interventions. Although there are no precise statistics on the number of inguinal hernia repairs performed annually, it was estimated to be 800,000 in 2003, regardless of recurrent and bilateral hernias<sup>5</sup>.

Hernia repair methods are divided into two categories of prosthetic repair and non-prosthetic initial repair. On the other hand, inguinal hernia repair methods are divided into two groups of the anterior repair methods and posterior repair methods according to the way of incision and exploration of the anatomy of the site. Anterior methods include tissue and prosthetic repair techniques. Recently, laparoscopic repair of inguinal hernia has been increasingly used<sup>6</sup>.

In the group of methods with anterior access, the Liechtenstein and Bassini methods are among the most commonly used techniques. The Liechtenstein method, which is a non-stretching method, is accompanied by embedding a mesh at the bottom of the inguinal canal. In the Bassini method, the inguinal canal is also reinforced in the form of tissue and by approximating the fascia transversalis to the Shelving Edge of inguinal ligament<sup>7</sup>.

Principles of the bassini repair method are reviewed in the Shouldice repair method and lead to better recurrence rates. As Bassini repair, the basics of this procedure include extensive dissection and anatomical rebuilding of the inguinal canal. The use of continuous sutures in multiple layers has the advantage of distribution of tension in different layers and prevent getting herniated between discontinuous sutures<sup>7</sup>. Regarding the types of tissue repair with or without mesh, posterior or anterior, if any technique can be performed correctly and completely, the results will be almost identical, however, because the Bassini method is a simple, common, and widely used technique and the results are fairly good, it is considered in this review<sup>7</sup>.

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One of the important aspects of any kind of surgery, especially inguinal hernia surgery, is patient satisfaction and quality of life after that. One of the most important causes of low quality of life in a tissue herniorrhaphy can be postoperative complications, especially pain in the area of operation, since after surgery, various pain syndromes may appear in the groin, usually caused by scar tissue, reaction to prosthetic material or nerve involvement in the steel or suture material during hernia repair<sup>8</sup>.

Although surgical repair of an inguinal hernia is simple, but there are many cases of hernia recurrence seen every year, resulting in dissatisfaction of patients, the need for further repair and the imposition of additional financial cost on the health system and the patient, that is its unpleasant consequences<sup>9</sup>.

Recurrence of the hernia is important because it can be associated with the same complications of early illness. Causes of recurrence of the disease can include wound infection, inappropriate surgical technique, inability to repair the inner ring, hernia stuck, increased intraabdominal pressure, connective tissue disease, and inadequate and incomplete suture of hernia sac (in the last factor the non-absorbable suture recommendation)<sup>10,11</sup>.

Considering the fact that in Iran, this study was conducted to investigate the rate of recurrence and pain after inguinal hernia surgery has not been performed in both Bassini and Shouldice methods, this study was conducted to compare recurrence rate and pain in these two methods.

## SUBJECTS AND METHODS

This prospective analytical study was carried out on all candidates for the inguinal hernia repair, which was referred to the Ali-ibn-Abitaleb hospital and under the operation of Herniorrhaphy, Zahedan, Iran, 2016. The ethical considerations were approved by the Research Ethics Committee of Zahedan University of Medical Sciences. The criteria for entering the study included the inguinal hernia affection that was confirmed by ultrasonography or clinical examinations, ages between 15 to 50 years, and the presence of surgical indication and exit criteria including heart disease, COPD affection, anticoagulant use, Corticosteroid use, co-morbidity causing pain, and drug addicts. The data collection tool was a collection form that was completed by resident of surgery from medical records and clinical examinations of patients. After collecting necessary data, the data were entered into SPSS-21 statistical software. For qualitative variables, frequency and percentage, and for quantitative variables, average and standard deviation were calculated. Independent T-test was used to analyse the data. Chi-square test was used to compare relapse rate in two groups. P value less than 0.05 was considered significant.

## RESULTS

In this study, 60 patients undergoing inguinal hernia surgery were studied. Of these 60 patients, 30 patients underwent herniorrhaphy surgery with Bassini surgery method and 30 patients had Shouldice surgery method. The study of frequency of men and women in the two groups shows that in the case of Bassini surgery, 26

patients (6.5%) were male and 4 patients (3.3%) were female. In the Bassini method, 93.3% of the patients had one-sided hernia and 6.7% had double-sided hernia. In the Shouldice method, 100% of patients had one-sided hernia. The mean pain intensity, 6 hours after inguinal hernia surgery in the Bassini and Shouldice surgery methods were  $5.2 \pm 2.20$  and  $5.53 \pm 2.56$ , respectively. According to t-test, there wasn't a significant difference between the pain intensity in the two surgical methods after 6 hours after surgery ( $P=0.952$ ).

Also, the mean pain intensity, 24 hours after inguinal hernia surgery in the Bassini and Shouldice surgery methods were  $4.13 \pm 1.92$  and  $3.93 \pm 1.76$  in the Shouldice method, respectively. According to t-test, there wasn't a significant difference between the pain intensity in the two surgical methods after 24 hours after surgery ( $p=0.676$ ).

Chi-square test showed no significant difference in the recurrence rate of the disease in two surgical methods ( $P=0.554$ ), (Table 1).

Table 1: Comparison of inguinal hernia recurrence in Bassini and Shouldice surgery

Follow up time after surgery	Surgery method	
	Bassini	Shouldice
3 months	-	-
6 months	1(3.3%)	-
9 months	-	-
12 months	-	2(6.7%)
Total	1(3.3%)	2(6.7%)

## DISCUSSION

Present study was conducted with a prospective analytical method with the aim of comparing the recurrence rate and mean pain in the two methods of Bassini and Shouldice on 60 patients who candidate for inguinal hernia surgery (50%, Bassini surgery method and 50%, Shouldice surgery method).

In our study, Chi-square test did not show a significant difference in recurrence rate of the disease in two surgical methods.

Amid et al. (2005) reported a recurrence rate of 30% in a repair method with mesh in a 10-year follow-up study<sup>12</sup>. Barth et al. (1998) reported a recurrence rate of 18% in Bassini method<sup>13</sup>.

The results of the study of Arvidsson et al. (2005) on 920 patients during a 2-year follow up indicated that the recurrence rate was 6.7% in the laparoscopic method, which did not have a significant difference with the recurrence rate in the Shouldice method, which was 6.6%<sup>14</sup>.

The results of study of Kux et al. (1994) on 750 patients in 4 groups under herniorrhaphy, including the Bassini method with absorbable suture, Bassini method with non-absorbable suture, Shouldice method using 4 rows of sutures and the Shouldice method using two rows of sutures showed that two-year recurrence rate after herniorrhaphy in patients who had surgery for the first time was 8.7% in both methods, which had a significant difference with the recurrence rate in the Shouldice method using 4 rows of suture (3.6%) and Shouldice method using 2 rows of suture (2.3%), but in the recurrence rate of patients underwent herniorrhaphy after relapse with

Shouldice method (7.6%) were not significantly different from the Bassini method (13.5%)<sup>15</sup>.

The 6-year follow-up results in studies of ZHOU et al. (2003) from 1983 to 1989, which were performed on 1647 patients candidate for herniorrhaphy, showed that the recurrence rate was 7.94% in Bassini and 6.1% in the Shouldice method<sup>16</sup>.

In a 15-year follow-up clinical trial, conducted by Zhang et al, there was a significant difference in the rate of recurrence in patients who underwent herniorrhaphy by the Bassini method (32%), compared to the Shouldice method (15%)<sup>9</sup>.

In a study by Nielsen et al. (2001), On the first day of surgery, patients completed the initial questionnaire, of which 28.7% of the pain was mentioned, the pain rate was not related to the type of hernia repair. About 80% of patients completed the second questionnaire after 2 months. About 46% (4%) mentioned the persistent pain and 11(8.1%) mentioned moderate to severe pain. In 194 people (16.6%), disorder in daily activity was due to pain<sup>17</sup>.

In a study by Khoshnevis et al. (2013) that evaluated the results and complications of Bassini, Liechtenstein and Shouldice treatments for inguinal hernia repair, there was no significant difference in pain, but one month after surgery, pain was significantly higher in the Shouldice group than in the other two groups, which remained within 3 months and 15 months after surgery. Also, the pain level in the Bassini group was less than one month and three months after the surgery, however, after 15 months, the pain rate was matched between the Bassini and Liechtenstein groups. There was no difference between the three groups in terms of hematoma and seroma in the surgical site as well as the ischemic orchitis. The recurrence rate was similar in all three methods<sup>18</sup>. These results are consistent with our study in terms of the rate of hernia's recurrence and pain intensity on the first day of surgery, but were not comparable in this study due to the lack of examination of pain intensity in the following months in this study.

The results of above studies coincided with our study. According to t-test, there was no significant difference in pain intensity between two surgical methods 6 hours (p=0.592) and 24 hours (p=0.676) after surgery.

Bulbulla et al. (2015), the aim of comparison of the recurrence rate in two methods of Bassini and Shouldice during the 3-year period after surgery, 12 patients from 125 patients in the Bassini group and 2 patients from 125 patients in the Shouldice group had recurrence<sup>19</sup> that was not consistent with the results of our study, which could be due to a longer follow-up period in the recurrence rate study in these patients.

## CONCLUSION

The results of present study show both Bassini and Shouldice methods have similar effects and recurrences, also both methods can be used to repair inguinal hernia. However, due to the lower costing of the Bassini method, this method may be more suitable to repair inguinal hernia in less developed countries.

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