

Original Article

Short term results of stapled versus conventional hemorrhoidectomy within 1 year follow-up

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Abstract: Background: Conventional hemorrhoidectomy is still used for patients but a variety of less invasive treatments are also developed. Stapled hemorrhoidectomy is known as a beneficial technique. Here we aimed to evaluate and compare the results of stapled hemorrhoidectomy with conventional methods in patients who require hemorrhoidectomy. Methods: This study was performed on 120 patients with stage 3 or 4 hemorrhoids. Mean resting pressure (MRP) and mean squeezing pressure (MSP) were measured before surgeries. Patients were then randomized into 2 groups of 60 patients. Group 1 underwent stapled hemorrhoidectomy and group 2 underwent conventional hemorrhoidectomy. The pain of patients was also determined using the visual analogue scale (VAS) for each patient 1, 2 and 3 days after the surgeries. Patients were then followed for 1 month after surgeries for evaluating the surgical outcomes, MRP and MSP. In terms of recurrence, they underwent clinical and anoscopic re-examination at least once in the next 6 months and 12 months after interventions. Results: We showed that both MRP and MSP did not change significantly in both groups after interventions ($P>0.05$). We also observed a significant decline in the pain of both groups ($P<0.001$) and also a significantly lower pain in group 1 ($P<0.05$). Our data showed that patients in group 1 required less analgesic after procedures ($P=0.001$). Evaluation of recurrence rate 6 and 12 months after interventions showed that patients who underwent stapled hemorrhoidectomy had a significant higher recurrence rate within 12 months compared to the other group ($P=0.003$). Conclusion: Stapled hemorrhoidectomy is a safe and effective method that is associated with lower pain, hospitalization duration and no significant complications within 1 year follow-up. But on the other hand, this surgical method was associated with a higher recurrence rate.

Keywords: Hemorrhoids, hemorrhoidectomy, complications, pain, recurrence

Introduction

Hemorrhoids are one of the most common anorectal diseases, affecting 5% of the general population and about 50% of people over the age of 50 years have complaints of the symptoms [1, 2]. Based on previous data, most patients with hemorrhoids indicate acceptable responses to maintenance therapy or less invasive surgery, and only 5 to 10% of cases require surgical hemorrhoidectomy [3]. The prevalence rate of hemorrhoids has been accounted for 4.4 in adults of the United States with the highest prevalence in 45-65 years [2].

Pathophysiological studies of hemorrhoids have indicated that increased pressure in the abdominal cavity is the most important factor

for dilatation and protrusion of hemorrhoidal vascular tissue [3, 4]. Both internal and external hemorrhoids can cause itching and anal discharge which are mostly due to hygienic problems. Internal hemorrhoids usually cause prolapse or painless bleeding from the rectum, which is referred to as the presence of blood on the toilet paper or bleeding during defecation [5]. On the other hand, external hemorrhoids can cause discomfort in the anal area due to enlargements. External hemorrhoid thrombosis is also a serious cause of acute pain in patients [6].

Studies have also declared that digital rectal examinations (DRE) can neither confirm the diagnosis nor rule out internal hemorrhoids [7]. Therefore, anoscopy seems like a necessary

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diagnostic method [8]. Internal hemorrhoids are presented as dilated, blue-purple veins in anoscopy. Protruded internal hemorrhoids could be also observed as dark pink masses at the edge of the anus which could also be painful [1]. External hemorrhoids appear pale pink and by the time of thrombosis, are acutely painful and purple. Medical treatments are appropriate for stage 1 hemorrhoids [9].

All patients with hemorrhoids must have bulky and soft stools that can be expelled without pressure [10]. This issue is also highly important after surgeries. High fluid intake and also fiber could be very beneficial in patients. Furthermore, studies have indicated that over-the-counter topical medications including steroids, anesthetics or disinfectants could bring positive results for almost all stages of hemorrhoids [11, 12]. However, long-term usage of topical steroids is associated with skin or mucosal atrophies.

Hemorrhoidectomy is the most beneficial and gold standard treatment method in higher stages of hemorrhoids. Conventional hemorrhoidectomy is still used for patients which are associated with some complications [13]. These procedures require a few days of hospitalization and also bed rest at home and have post-operative complications including bleeding and recurrent hemorrhoid. As a result, a variety of less invasive treatments are developed, some of which can be performed on an outpatient basis. Sclerotherapy, Photocoagulation, Rubber Band and Cryotherapy are some of these techniques [14, 15].

Stapled hemorrhoidectomy is known as a beneficial technique for the removal of abnormally enlarged hemorrhoidal tissue and also repositioning of the remaining hemorrhoidal tissue [16]. This procedure is performed by inserting a circular, hollow tube into the anal canal. Different lines of evidence have declared that usage of stapled hemorrhoidectomy is associated with more beneficial results and fewer complications and also shorter times of hospitalization compared to other methods [17].

Although, it has also been reported that more studies should be performed to compare and evaluate such techniques. So far, few studies have investigated the results of stapled hemorrhoidectomy and compared them to other tech-

niques [18]. As a result, regarding the high prevalence of hemorrhoids in the Iranian population and the need to develop safer and more beneficial techniques, here we aimed to evaluate and compare the results of stapled hemorrhoidectomy with conventional methods in patients who require hemorrhoidectomy.

Methods and material

Study design

The current study is a clinical trial performed in 2019-2020 in Imam Khomeini hospital, Aban and Maryam surgical clinics in Yazd, Iran on patients diagnosed with hemorrhoids who were candidates for surgical treatments. This study was approved by the Research Committee of Yazd University of Medical Sciences and the Ethical committee has confirmed it.

Inclusion and exclusion criteria

The inclusion criteria were: age between 18-65 years, a new diagnosis of internal or complex hemorrhoid by expert surgeons, having stage 3 or 4 hemorrhoids, no response to common medications and signing the written informed consent to participate in the study. The exclusion criteria were: having thrombosed hemorrhoids, addiction, previous history of anorectal surgeries, having anal fissure or fistula, previous gastrointestinal diseases, disturbed coagulation tests and patient's will to exit the study.

Pre-operative measurements

120 patients were entered into the study. Demographic data were collected from patients. Patients underwent preoperative manometry to determine anal canal pressures. Mean resting pressure (MRP) and mean squeezing pressure (MSP) were measured before surgery. Surgical procedures of both stapled and conventional hemorrhoidectomy were explained to all patients.

Grouping

Patients were then randomized into 2 groups of 60 patients using Random Allocation Software. Group 1 underwent stapled hemorrhoidectomy and group 2 underwent conventional hemorrhoidectomy. All procedures were performed in both groups under spinal anesthesia and the lithotomy position.

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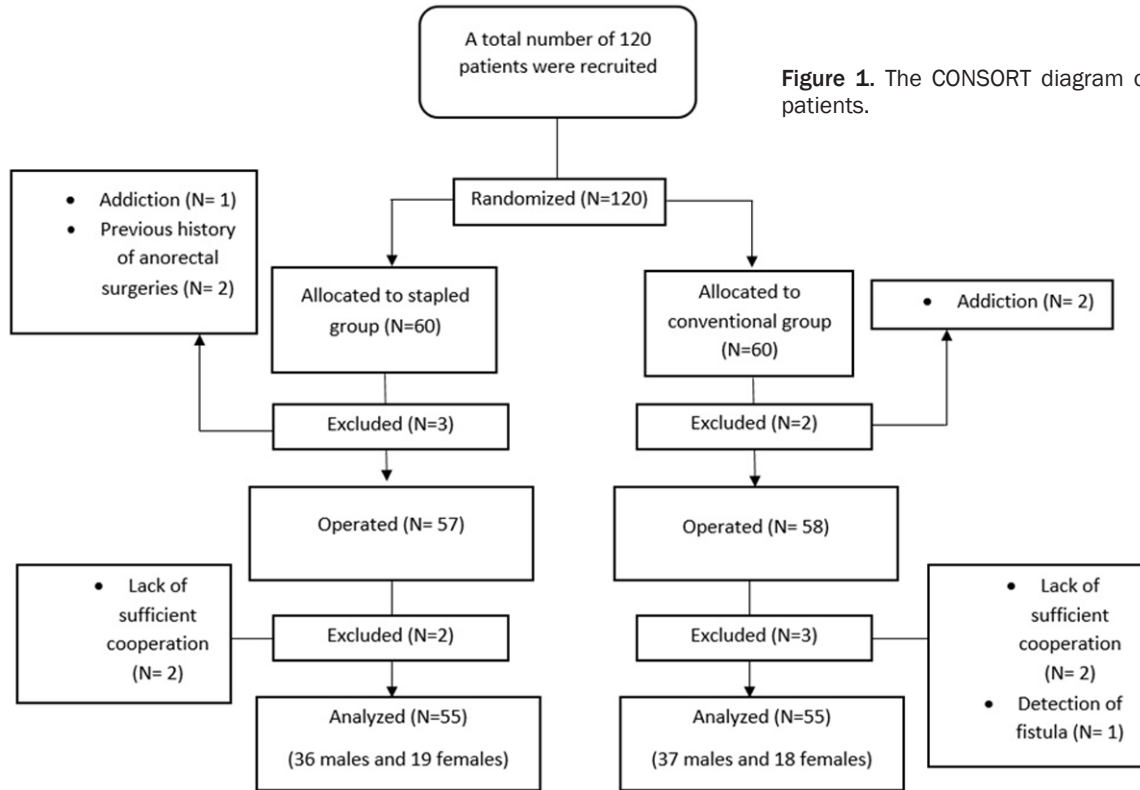


Figure 1. The CONSORT diagram of patients.

Assessment tools

The pain of patients was also determined using the visual analogue scale (VAS) for each patient 1, 2 and 3 days after the surgeries and compared in both groups. Based on VAS, each patient reported his/her pain on a scale of 0 (no pain) to 10 (most severe pain). The need for analgesics after the surgeries was also assessed in all patients. Patients were then followed for 1 month after surgeries for evaluating the surgical outcomes and possible complications, MRP and MSP. Mean duration of surgeries, mean intra-operative blood loss and post-operative analgesic injections were also measured and compared between groups. In terms of recurrence, they underwent clinical and anoscopic re-examination at least once in the next 6 months and 12 months after interventions.

Statistical analysis

After completing the checklists, the information obtained from the patients was entered into SPSS software (version 24, IBM Corporation, Armonk, NY). After a general descriptive analysis, the differences between the two groups in terms of preoperative demographic variables, if

quantitative or qualitative, were determined using the Student's t-test and the square-Chi test, respectively. The value of $P < 0.05$ was considered significant.

Results

Study population

A total number of 120 patients were recruited and divided into two groups. Five patients in each group were excluded due to the following reasons: addiction, previous history of anorectal surgeries, lack of sufficient cooperation and detection of fistula. The CONSORT diagram of patients is illustrated in **Figure 1**. Data of 110 patients were analyzed. The mean age of patients was 39.5 ± 8.4 years. Our study population consisted of 37 women (33.6%) and 73 men (66.4%). There were no significant differences between the two groups of patients regarding age and sex ($P > 0.05$). These data are demonstrated in **Table 1**.

MRP and MSP

Pre-operative measurements of MRP and MSP were performed which indicated no significant

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Table 1. General information and clinical features of patients

Variable	Group 1 (N=55)	Group 2 (N=55)	P-value
Gender (N (%))			
Male	36 (65.4%)	37 (67.3%)	0.722
Female	19 (34.6%)	18 (32.7%)	
Age (years) (Mean \pm SD)	38.5 \pm 9.5	40.5 \pm 7.3	0.662
MRP (mean \pm SD)	66.8 \pm 10.3	62.7 \pm 11.5	0.544
MSP (mean \pm SD)	148.9 \pm 15.6	133.2 \pm 14.8	0.712

differences between the two groups of patients ($P=0.544$ and $P=0.712$ respectively) (**Table 1**). Our analysis showed that both MRP and MSP did not change significantly in both groups after interventions ($P>0.05$). These data are summarized in **Table 2**.

Pain evaluation

Evaluation of pain showed that the mean VAS score in group 1 was 7.2 ± 0.8 , 6.3 ± 0.4 and 4.8 ± 1.2 , respectively 1, 2 and 3 days after interventions. Same measurements for group 2 indicated the mean VAS score was 8.5 ± 1.3 , 7.2 ± 0.9 and 6.3 ± 1.4 , respectively 1, 2 and 3 days after surgeries. These results showed a significant decline in the pain of both groups ($P<0.001$) and also a significantly lower pain in group 1 ($P<0.05$) (**Table 3**).

Further assessments

We also showed that patients in group 1 required less analgesic after procedures ($P=0.001$). Our data showed that the mean morphine injections in group 1 were 0.7 ± 0.2 ml but group 2 had 1.4 ± 0.4 ml injections of morphine. There were no significant differences between the two groups regarding mean operation duration (45.2 ± 9.21 minutes in group 1 versus 43.7 ± 12.3 minutes in group 2, $P=0.082$). Assessments of intra-operative blood loss also showed no significant differences between the two groups ($P=0.117$). Mean hospitalization duration was also significantly lower in group 1 ($P<0.001$) (2.2 days in group 1 and 3.5 days in group 2).

Complications

We also observed no infection, bleeding and other surgical complications in both groups. Evaluation of recurrence rate 6 and 12 months after interventions showed that patients who

underwent stapled hemorrhoidectomy had a significant higher recurrence rate within 12 months compared to the other group ($P=0.003$). But within 6 months after surgeries, no significant differences were observed between the two groups ($P=0.677$).

Discussion

Here in the present study, we showed that the mean MRP and MSP did not change significantly in both groups after interventions. On the other hand, evaluation of pain showed a significant decline in the pain of both groups. Furthermore, we showed that patients who underwent stapled hemorrhoidectomy had lower pain compared to a conventional hemorrhoidectomy. We also showed that patients undergoing stapled hemorrhoidectomy required less analgesic after procedures and had a significantly lower hospitalization duration compared to the other group. On the other hand, our data showed a higher recurrence rate within 12 months in patients undergoing stapled hemorrhoidectomy. These procedures have also been examined in previous studies.

In a systematic review that was performed by Nisar and colleagues in 2004, they investigated the results of fifteen trials recruiting 1077 patients. They showed that patients who underwent stapled hemorrhoidectomy had a lower duration of hospitalization and operation time. They also showed that this method is associated with a higher recurrence rate compared to conventional hemorrhoidectomy [19]. Another study was conducted by Baliga and others in 2016 on 60 patients. They compared the results of stapled and conventional hemorrhoidectomy in 60 patients and showed that patients in the stapled hemorrhoidectomy group had lower pain and returned to their normal daily activity sooner than the other group. They also showed no significant differences in complications between the two groups. But they performed a short-term study and suggested that long-term follow-ups are required [20].

These results are in line with the findings of our study, emphasizing the effectiveness of stapled hemorrhoidectomy compared to the conventional method. In another study by Bilgin and colleagues in 2015, short term and long term results of stapled and conventional hemor-

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Table 2. Comparison of pre-operative and post-operative MRP and MSP in patients

Evaluation time	MRP (mean ± SD)		MSP (mean ± SD)	
	Group 1	Group 2	Group 1	Group 2
Pre-operative	66.8±10.3	62.7±11.5	148.9±15.6	133.2±14.8
1 months after surgeries	63.4±12.7	59.6±9.8	135.6±16.2	128.6±2.4
P-value	P=0.833	P=0.640	P=0.724	P=0.690

Table 3. Pain scores in patients

Evaluation time	VAS in group 1 (mean ± SD)	VAS in group 2 (mean ± SD)	P-value
1 day after surgery	7.2±0.8	8.5±1.3	0.448
2 days after surgery	6.3±0.4	7.2±0.9	0.021
3 days after surgery	4.8±1.2	6.3±1.4	0.001
P-value	P<0.001	P<0.001	

roidectomy were compared within 99 patients. They showed that pain scores were not different among two groups of patients although severe pain was significantly more common in patients undergoing conventional hemorrhoidectomy [21]. The higher recurrence rate in patients treated with stapled hemorrhoidectomy has been also indicated by Jayaraman and others in 2007. They indicated that conventional hemorrhoidectomy is associated with a higher recurrence rate but also higher pain and hospitalization [22].

Sturiale and colleagues also evaluated the long-term results of stapled hemorrhoidectomy in 190 patients with a mean follow-up of 12 years. They showed that stapled hemorrhoidectomy is an effective and beneficial method that is associated with a higher satisfaction rate in patients. But is also associated with a high recurrence and incontinence rate. they also suggested that more stringent selection criteria in association with the use of large volume devices can lead to better results [23]. These results are somehow in line with our findings but we also observed that both MRP and MSP did not change significantly in all patients and no incontinence was observed among our study population. These differences could be due to the study populations. However, we believe that age, underlying disease and diet play pivotal roles in the long-term outcome of both surgical methods.

Jayaraman and others had a review of the comparison of stapled and conventional hemorrhoidectomy in 2006. They emphasized that stapled hemorrhoidectomy is an effective and beneficial method that is associated with bet-

ter results compared to conventional hemorrhoidectomy but the higher recurrence rate of this method could also play an important role in choosing the techniques [24]. Giordano and colleagues also emphasized this issue and suggested that these facts must be explained to patients and they should decide whether to accept a higher recurrence rate to take advantage of the short-term benefits of stapled hemorrhoidectomy [25].

Conclusion

Here we showed that stapled hemorrhoidectomy is a safe and effective method that is associated with lower pain, hospitalization duration and no significant complications within 1 year follow-up. But on the other hand, this surgical method was associated with a higher recurrence rate compared to the conventional hemorrhoidectomy.

Disclosure of conflict of interest

None.

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