



The Clinical Efficacy of Infrared Photocoagulation Versus Closed Hemorrhoidectomy in Treatment of Hemorrhoid

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Abstract

Introduction: Infrared photocoagulation (IRC) was introduced as a mainstay procedure for treatment of hemorrhoids. The present study aimed to compare the clinical efficacy of IRC compared to closed hemorrhoidectomy.

Methods: Forty patients suffering grade-3 hemorrhoid that referred to the surgery clinic at Imam Hossein hospital in Tehran in 2013 were randomly assigned to groups treated with the IRC modality or Ferguson's closed hemorrhoidectomy method. The patients in the 2 groups were followed-up for the first 24 hours after surgery and 8 weeks later. Postoperative pain was assessed using visual analogue scale (VAS) at three time points of 24 hours, 2 weeks and 8 weeks after operation.

Results: Regarding bleeding, its overall prevalence was 5.0% in the IRC group and 30.0% in the hemorrhoidectomy group, which was significantly less prevalent in the IRC group. Notably, the IRC group had a lower mean postoperative pain score compared to the hemorrhoidectomy group. Time of return to work was significantly shorter in the IRC group; no difference was found in the mean duration of hospital stay, and recurrence rate across 2 groups.

Conclusion: IRC procedure is safer than closed hemorrhoidectomy with lower postoperative pain severity, less secondary bleeding, and leads to earlier return to work in patients with hemorrhoid.

Keywords: Infrared photocoagulation; Hemorrhoidectomy; Pain, Bleeding; Hemorrhoid.

Introduction

Hemorrhoid is now one of the most frequent anorectal complaints with a lifetime risk up to 5%.¹ Also, half of the individuals suffering from this disease need treatment from whom 10% to 20% require surgical treatment due to symptoms severity.^{2,3} Hemorrhoids commonly manifest with bleeding and perianal mass protruding from the anus as well as anal discharge. Most patients experience symptoms alleviation by following appropriate high fiber diet regimens or the use of fiber supplements, leading to the treatment of the disease symptoms by non-surgically.^{4,5} In fact, this approach is frequently considered in low-grade hemorrhoids, while high grades mostly require other non-invasive or even invasive procedures.⁶ In general, the aim in treating hemorrhoids is the removal of the manifestations, decrease in disease recurrence, and minimization of post-procedural complications such as anal sphincter injury, secondary bleeding, and stenosis.⁷ Thus, in accordance with the stage of hemorrhoid, various single or combined treatment methods may be scheduled to minimize these adverse events.

The anal dilation procedure was primarily introduced in 1968, in which the expansion of the anal sphincter led to the widening of subrectum and anal canal.⁸ Despite its high clinical efficacy, it may be accompanied with potential complications including partial fecal incontinence as well as high recurrence rate.⁹ Later, bipolar diathermy coagulation was introduced based on bipolar electrocautery at the intermuscular hemorrhoid area.¹⁰ In spite of high general success rate with rare significant complications, this procedure may be limited only for low-grade hemorrhoid.¹¹ In 1981, infrared photocoagulation (IRC) was introduced as a mainstay procedure for treatment of hemorrhoids based on generating sclerosis and fixation of hemorrhoids.¹² The success rate of this procedure has been estimated at 67% to 96% with low procedural complications.¹³ Similar to surgical procedures, despite appropriate clinical results, high price of its equipment may limit its application.¹⁴ In total, the superiority of IRC to surgical management has remained uncertain particularly with regard to its side effects and clinical efficacy, as well as its cost-

effectiveness. Given the high prevalence and high rate of surgical procedures performed in for hemorrhoid, finding methods which reduce the rate of hospitalization and staying away from the work as well as use of palliative drugs can play an important role in the economic aspect. The present study aimed to compare the clinical efficacy of IRC in comparison with closed hemorrhoidectomy in patients with hemorrhoid.

Methods

Study Population

This work was performed, as a randomized clinical trial study, on 40 patients with grade 3 hemorrhoid that referred to the surgery clinic at Imam Hossein hospital in Tehran in 2013. The patients with a history of anal surgery, any grade of fecal incontinence, simultaneous underlying disorders such as fissure, fistula, or thrombosed hemorrhoid were excluded from the study– as exclusion criteria.

Study Protocols

The computer-generated allocation schedule was used for randomly assigning the patients to treatment with IRC (n = 20) or Ferguson's closed hemorrhoidectomy (n = 20). Initially, all patients were put under spinal anesthesia and placed in lithotomy position. Through the following steps, closed hemorrhoidectomy was performed: using a curved forceps, as it was applied at outside the mucocutaneous junction for perianal skin, dislocating as well as isolating hemorrhoid mass; using another curved forceps, at the base of the internal hemorrhoid; suturing the internal hemorrhoid seen under the forceps; and then removing the internal hemorrhoid by a knife. In final, the first forceps were left in the site. In IRC, the following steps were performed: inserting the probe in the anus and in this way establishing contact with the small area above the hemorrhoid; delivering the short bursts of infrared light by the probe, in a way that it took only a second or 2 for venous coagulation of hemorrhoid. The patients in the 2 groups were followed-up for the first 24 hours after surgery to assess early postoperative complications including secondary bleeding, local pain, urinary incontinence, prolonged hospital stay, and recovery time, as well as at 8 weeks after to determine disease recurrence. Postoperative pain was assessed at three time points of 24 hours, 2 weeks and 8 weeks after the operation, using the visual analogue scale (VAS) scoring rated 0 (without pain) to 100 (the worst possible pain).

Statistical Analysis

For the quantitative variables, the results were presented as mean \pm standard deviation (SD). Also, for categorical variables, the results were summarized by frequency (percentage). In cases where the data did not appear to have a normal distribution or when, across the study groups, the assumption of equal variances was violated, continuous variables were compared using *t* test or Mann-

Whitney U test. The other, categorical variables were evaluated via chi-square test. Analyzing and interpreting the results was done with statistical software SPSS, the version of SPSS was 16.0 for windows (SPSS Inc., Chicago, IL). *P* values of 0.05 or less were considered statistically significant.

Results

The patients undergoing IRC and closed hemorrhoidectomy were matched for mean age (39.25 ± 7.03 years versus 38.40 ± 8.48 years, $P=0.742$), male gender (35.0% versus 45.0%, $P=0.518$), and the frequency of baseline urinary retention (20.0% versus 25.0%, $P=0.705$). Moreover, for overall prevalence of bleeding, it was computed as 5.0% in IRC group and 30.0% in hemorrhoidectomy group; which was significantly less prevalent in IRC group ($P=0.037$). Despite numerical higher recurrence rate in those who underwent IRC than in patients who had undergone hemorrhoidectomy (5.0% versus 20.0%), a statistically non-significant difference was found among the groups ($P=0.152$). The lower mean of postoperative pain score was found in the IRC group compared to the hemorrhoidectomy group (2.85 ± 1.04 versus 6.20 ± 1.51 , $P < 0.001$). Also, the time for returning to work was significantly shorter in IRC group than in the other group (1.85 ± 0.75 versus 5.25 ± 1.33 , $P < 0.001$), no difference was found in mean duration of hospital stay across the groups (1.05 ± 0.22 days versus 1.30 ± 0.57 , $P=0.075$) (Table 1).

Discussion

IRC is a procedure that utilizes infrared light for thrombosis and scarring of the hemorrhoid using an infrared device consisting of a light generator and a long probe. Over the subsequent days after exposure to light, the underlying exposed tissue sloughs and thus this technique can be very useful to treat small hemorrhoid tissues. This method is a proper alternative to surgical procedures such as open or closed hemorrhoidectomy because of its less invasive nature, however its beneficial effects regarding clinical postoperative outcomes are unknown. Our study could show the superiority of IRC in comparison with closed hemorrhoidectomy in regard to postoperative pain, secondary bleeding, as well as return to work and daily activities. In other words, the application of IRC can

Table 1. Postoperative outcome in patients undergoing IRC and hemorrhoidectomy

Item	IRC Group (n = 20)	Hemorrhoidectomy Group (n = 20)	P Value
Bleeding	1 (5.0)	6 (30.0)	0.037
Recurrence	4 (20.0)	1 (5.0)	0.152
Time to returning work	1.85 ± 0.75	5.25 ± 1.33	<0.001
Length of hospital stay	1.05 ± 0.22	1.30 ± 0.57	0.075
Pain score (VAS)	2.85 ± 1.04	6.20 ± 1.51	<0.001

lead to high patients' satisfaction level as well as lower requiring postoperative analgesics. Most previous studies confirm our findings. As indicated by McLemore et al in a prospective interventional case series,¹⁵ improvement in global symptoms was found in almost all patients treated with IRC without notable postoperative complications and thus this procedure was introduced as an efficient modality for treating hemorrhoid. According to the study by Mishalov et al,¹⁶ all components of quality of life were significantly improved following IRC. In another study by Ricci et al,¹⁷ the superiority of the IRC method compared to rubber band ligation was demonstrated regarding postoperative pain severity within the first week after surgery; however the 2 techniques were similar in terms of other clinical indicators as well as long-term success rate. In a 5-year follow-up study on patients who had undergone IRC,¹⁸ since this method is quick, safe, effective and painless for treatment of hemorrhoids, the conventional method can be changed to this method as an alternative method. In a study by Gupta¹⁹ comparing IRC and rubber band ligation, it was shown that IRC is preferred to ligation in regard to lower postoperative pain as well as more suitable in case of recurrence. Charúa Guindic et al²⁰ introduced IRC technique as an excellent treatment method for hemorrhoids grades I and II with considerable low postoperative pain, low cost, and high success rate, with its failure rate estimated to be only 6.6%. According to the survey by Nevah,²¹ the main advantages of IRC referred to the absence of serious complications, easy to use by a single operator, use as a portable equipment, easy to handle and long lasting, and needing little maintenance. However, according to our research, this study was the first comparing clinical efficiency of IRC and closed hemorrhoidectomy and showed higher effectiveness of IRC in comparison with hemorrhoidectomy. In fact, this comparison showed that regarding clinical outcomes, IRC is a safe and effective alternative to invasive procedures in the treatment of hemorrhoids and thus it can be considered as the first choice treatment for hemorrhoids in earlier grades. However, our study had limitations, which, with conducting the study on more subjects and investigating the recurrence in a longer time range, can represent more accurate results in comparing the 2 methods.

Conclusion

IRC procedure is safer than closed hemorrhoidectomy in regard to lower postoperative pain severity, secondary bleeding, and leads to earlier return to work in patients with hemorrhoid.

Ethical Considerations

The Ethics Committee of Shahid Beheshti University of Medical Sciences approved the study (identifier: IRCT2013052634170N1; <http://irct.ir>) and all the patients included in the study signed the informed consent.

Conflict of Interests

All authors declare that they have no conflict of interest.

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