

INFRARED COAGULATION VERSUS RUBBER BAND LIGATION IN THE TREATMENT OF INTERNAL HAEMORRHOIDS – A RANDOMISED, PROSPECTIVE STUDY

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ABSTRACT

Objective: The aim of the study was to compare the effectiveness, patient tolerance, need and complications of infrared coagulation (IRC) versus rubber band ligation in the treatment of uncomplicated internal haemorrhoids.

Design: Randomised Control Trial.

Place and Duration of Study: Study was done at surgical outpatient department of Combined Military Hospital (CMH), Multan, from January 2001 to April 2002.

Patients and Methods: A total of 150 patients with uncomplicated internal haemorrhoids without any concomitant ano-rectal disease were randomized and treated by infrared coagulation (IRC) or rubber band ligation (RBL) in two groups (75 patients in each group). Infrared coagulation or RBL was performed in one or more session with four weeks interval until symptoms (bleeding and or prolapse) were resolved. Treatment outcome and complications were assessed by proctoscopy and questionnaire. Follow up was made at three months, six months and twelve months.

Results: Treatment outcome was assessed in 150 patients. For IRC 71 (94%) patients and for RBL 66 (88%) patients were symptom free after twelve months. Pain following treatment was more common and more severe after RBL than after IRC. Bleeding occurred in both IRC and RBL patient without any significance.

Conclusion: IRC and RBL were equally effective in the treatment of internal haemorrhoids. The rate and severity of pain was higher after rubber band ligation. Infrared coagulation should be the first line of treatment for haemorrhoids.

Keywords: Haemorrhoids, infrared coagulation, rubber band ligation, photocoagulation

INTRODUCTION

Haemorrhoidal disease is a very common ano-rectal condition affecting many individuals throughout the world. Its prevalence varies between 4.4% to 86% [1,2]. People of both sexes suffer from the disease with peak incidence ranging from 45-65 years [2]. Symptoms include bleeding, prolapsing tissue, soiling, discharge, itching or pain (particularly if thrombosed). Haemorrhoids are internal or external according to the position relative to dentate line or they may be mixed called interno-external [3]. Haemorrhoids are graded by the degree of prolapse according to grading system published by Banov et al [4]. First degree haemorrhoids are merely visible vessels and

only bleed, second degree lesions prolapse with defecation but return spontaneously, third degree lesions prolapse and require manual replacement and fourth degree lesions remain prolapsed. There are many options available for the treatment of haemorrhoids depending upon their degree. There is usually a prolonged delay in seeking an advice from a doctor by patients suffering from haemorrhoids. The best treatment remains prevention by avoiding constipation, intake of high fiber diet and administration of bulk laxatives. In most cases of internal haemorrhoids a swift and effective treatment can be given in an outpatient clinic. Internal haemorrhoids arise above dentate line in anus which is devoid of sensory nerve fibers and

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do not need an anaesthetic. External haemorrhoids develop below dentate line and are exquisitely sensitive. Surgical haemorrhoidectomy is usually reserved for fourth degree lesions or a few cases of third degree lesions and is most often done on indoor patients. Non surgical treatment options available to treat first to third degree uncomplicated internal haemorrhoids include injection sclerotherapy (5% phenol in almond oil) , rubber band ligation, cryosurgery, laser surgery, radio frequency coagulation and direct current coagulation. However, these modalities are not suitable for all grades of internal haemorrhoids and are associated with recognizable complications. Sclerotherapy is usually indicated only in first and second degree lesions [5]. Laser therapy is said to be less painful but this has proved difficult to verify [6]. Cryotherapy is associated with profuse and prolonged discharge and poor results and is little used. The rubber band ligation is suitable for first to third degree haemorrhoids. The infrared coagulation is gaining rapid acceptance for outpatient treatment of first and second degree internal haemorrhoids and some third degree ones. The treatment modality that is easy to administer, cost-effective, with less complications and reduces likelihood of surgery would be attractive to surgeons and patients alike. In this study, infrared coagulation (IRC) and rubber band ligation (RBL) have been compared to treat internal haemorrhoids.

PATIENTS AND METHODS

In this randomised control trial, 150 patients at Combined Military Hospital, Multan (from Jan 2001 to 2002), with uncomplicated internal haemorrhoids were assigned randomly to IRC or RBL.

Patients with associated anal fissures, anal spasm for infective pathologies like cryptitis or proctitis or carcinoma rectum and

patients who refused to sign an informed consent form were excluded from the study. No anaesthesia was administered during the procedure.

All patients were treated in outdoors and were sent to home one hour after the procedure. A laxative was prescribed to the patients for regular use. No analgesics were prescribed to the patients treated with IRC. However, patients treated with RBL were asked to take two tablets mefenamic acid if they developed pain. The patients were asked not to strain on defecation and were warned that they should expect some bleeding during the first week. Patients were advised to visit outpatient's clinic if they developed pain, bleeding or any other complication. The procedure used was as follows,

Infrared Coagulation (IRC)

IRC was carried out in left lateral position or knee elbow position. The IRC instrument used for the study was Redfield IRC 2100 (USA). A 220 mm guide with a tip of diameter of 6mm was used for coagulation. . IRC was applied at 3, 7 and 11O'clock positions. Three to five 1-1.5 seconds exposures were applied 1 to 2 mm apart to the mucosa at the base of haemorrhoids in rainbow or diamond shape proximal to the dentate line. The largest pile was dealt with first and so on. Two or three haemorrhoids were dealt with in a single session and remaining if any, were treated after four weeks interval. The mean duration of treatment was 5 min (range 4-8 min). No assistance was required to the surgeon during the procedure.

Rubber Band Ligation (RBL)

RBL was performed with Barron's haemorrhoidal ligator (made by Rudolf, Germany). The procedure was carried out in left lateral or knee elbow position. A pair of elastic bands was mounted on the drum of the ligator. After lubrication the proctoscope was

inserted and held by an assistant. Under good illumination, the long shaft of the ligator was advanced through the proctoscope and its hollow drum bearing rubber band was positioned over the haemorrhoids. The pile was drawn into the drum of the ligator with the help of a grasping forceps. A more proximal position was selected if the patient complained of any pain. By pressing the handle of ligator bands released and instantly fitted snugly at the base of the pile. One to two piles were dealt with in one session and remaining if any, were treated after four weeks.

Follow up

Patients were reviewed every four weeks until asymptomatic or until they had undergone a maximum of three treatment sessions. Complications were recorded. Proctoscopy was repeated and presence or absences of haemorrhoids were noted. However, the necessity of further treatment was directed by the patient's symptoms regardless of the proctoscopy features. Thereafter patient were reviewed three months, six months and one year after the treatment. On each occasion the outcome of treatment was noted. Pain was assessed using a visual analogue scale from zero (no pain at all) to 10 (the worst pain) the patient had ever experienced. The patient's willingness to undergo the same method of treatment, if necessary was sought as an index of its acceptability. Data has been analyzed SPSS 10. Describes statistics were used to describe the data. Results of two groups were compared using chi-square test. P-value 0.05 was considered as significant.

RESULTS

One hundred fifty patients were randomized in two groups, IRC (75 patients) & RBL (75 patients) and followed up for a period of 12 months from the date of the procedure. In group A 55 (73%) were males

and 20 (27%) were females and group B, 61 (81%) were males and 14 (19%) were females ($p>0.05$). The age ranged from 18 to 85 years, average age in group A was 45 years while in group B was 48 years ($P>0.05$). In group A 3(4%) patient had first degree haemorrhoids, 62 (83%) had second degree lesion and 10 (13%) patient had third degree lesion while in group B 2(3%) patient had first degree lesion, 59 (79%) were suffering in second degree and 14 (19%) were suffering in third degree lesion ($p>0.05$). In group A, 75 patients were treated by IRC, out of them 71(94%) patients responded to treatment and were symptom free after 12 months follow up while 3 patients relapsed and needed repeat procedure resulting in cure while one patient showed no response to treatment and needed surgery.

In group B, 75 patients were treated by RBL out of these 66 (88%) patients were symptom free at end of 12 months follow up 3 (4%) patients relapsed and needed further treatment while 6 (8%) patients showed no response and were treated by haemorrhoidectomy ($p>0.05$) (Table1). None of the patients from two groups had any sepsis in the form of local infection or systemic manifestation. Time off work is defined as the total period taken to return to the usual activities of domestic and social life at the discretion of the patient. Patients from the IRC group were able to resume their routine activities comparatively earlier than patients from the RBL group.

Postoperative Pain

The intensity and duration of postoperative pain in the first week were greater in the RBL than in the IRC group (4-6 vs. 0-3 on a visual analogue scale) and this difference was statistically significant ($P<0.05$).

Bleeding

Fourteen (19%) of the patients from the IRC group complained of bleeding whereas 18 (24%) patients from RBL group complained of bleeding. Such complaints were reported mostly during the period from day 5 to day 10 after the procedure. The bleeding was almost always associated with defecation. None of the patients needed admission and were conservatively managed.

DISCUSSION

Numerous nonsurgical treatments are available to treat patients with early stage internal haemorrhoids, but no single therapy has proved its efficacy [7]. These procedures are usually performed in the office setting and do not require anaesthesia. Although non excisional, they all function as ablative by sclerosis, thrombosis or necrosis of the mucosal portion of the haemorrhoidal complex. The developing trend is to prefer an improved outpatient technique for ablation of haemorrhoid rather than for their excision as haemorrhoidectomy carries a high morbidity [8].

Infrared coagulation (IRC) is used as an outpatient treatment of first and second degree internal haemorrhoids and some third

of light being instantly converted into heat. The result of IRC presumably is the immediate reduction of blood flow to the haemorrhoids followed by tethering of mucosa to the underlying tissue as healing occurs in this process by cicatrization [9]. The depth of coagulation can be precisely determined according to the duration of exposure.

Rubber band ligation (RBL) is considered to be effective treatment of haemorrhoids [10]. This is suitable for first to third degree haemorrhoids, but the draw back is that two people are needed, one to hold the anoscope and the other to apply the bands. Since its introduction, many new modifications have been introduced in the procedure. Synchronous ligation [11] of all haemorrhoids with a modified anoscope [12] and using a videoscope and suction ligation are a few such innovations that have helped to achieve better results. However, despite all of these modifications post ligation pain and discomfort is associated with the RBL [13]. With the introduction of IRC, it is possible to eliminate this potential cause of concern by surgeons while achieving results that almost match those obtained with RBL. Both IRC and RBL can be performed as office procedures.

Table-1: Response to Treatment

Treatment Groups	Response of the Patients (%)		
	Asymptomatic	No Response	Additional Treatment
IRC (n=75)	71 (95%)	1 (1%)	3 (4%)
RBL (n=75)	66 (88%)	6 (8%)	3 (4%)

Table-2: Showing Comparison of Outcome of Rubber Band Ligation with Other Studies

Study	Year	No. of Patients	Follow-up	Cure/Improved
Zafar [17]	1999	100	01 yrs	72%
Aftab [18]	1995	71	03 months	92%
Komorozos [19]	2000	500	02 yrs	88%
Oueidet [20]	1994	148	18 months	81%
Adamthwaite [21]	1983	52	02 yrs	98%
Murie [22]	1980	100	01 yrs	80%

Present study degree ones. IRC works by penetrating the tissue to a predetermined depth at the speed of light. No assistant is required during application of infrared coagulation

In the present study, 71 patients treated with IRC were asymptomatic after one year with success rate of (95%). The results are comparable to other studies. In a study by Abid ML [14], IRC was used in 180 patients in the management of non prolapsing and early prolapsing hemorrhoids in 1999 with a follow up of 3 months. In this study cure rate was 74.50% and IRC was more effective in treating non prolapsing haemorrhoids (83.3%) compared to prolapsing haemorrhoids (69.3%). In two other studies, patients treated by IRC, success rate of 92% to 93.4% has been reported [15, 16]. In this study, 75 patients have been treated by RBL with success rate of 88%. This is comparable with other studies from Pakistan [17,18] and abroad [19-22] (Table-II).

In view of the previous experience of discomfort with RBL some observers have even tried injection of local anaesthetics into the post banded pile mass to relieve pain occurring after the procedure [23]. This indicates that the pain intensity after the procedures is truly as severe as generally described in the literature. We have never used a local anesthetic. In contrast, IRC is associated with mild post procedural discomfort noted for 1-2 days. While band ligation is marked by a large number of complaints of an inflammatory character like tetanus, band related abscess, rectovaginal fistula or bacteremia [24]; no such incidence has been reported with IRC. Other complications related to RBL include urinary retention, band slippage, prolapse and thrombosis of adjacent haemorrhoids, anal stenosis [11] and severe bleeding. The present study shows that IRC is a safe and effective alternative to RBL since it is quick and safe. Except for the initial cost of the instrument there are no expenses of a recurring nature. The application is easy and procedure is better tolerated by the patients than banded

ligation, thus IRC can be considered as a suitable procedure for early haemorrhoids.

CONCLUSION

Formal surgical haemorrhoidectomy is associated with severe pain and morbidity. Newer outpatient methods provide a prompt effective treatment in most cases. Infrared coagulation and rubber band ligation are equally effective in the treatment of haemorrhoids. However, as RBL is associated with severe pain, IRC may be the first line of treatment for internal haemorrhoids.

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