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Infrared Coagulation versus Rubber Band Ligation in Early Hemorrhoids; PAIN VS GAIN.

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Abstract:

The ideal therapy for early degrees of hemorrhoids is always debated. Some are more effective but are more painful, others are less painful but the efficacy is in the same proportion. So pain or gain is a major concern. In this randomized study, a comparison is made between infrared coagulation and rubber band ligation. One hundred patients of 2nd degree bleeding piles were randomized prospectively to either band ligation or infrared coagulation technique.

Parameters measured included postoperative discomfort and pain, period for return to work, relief in incidence of bleeding and recurrence rate. The patient demographic was comparable in two groups. The postoperative pain in the first week was more in band ligation group (2-5 versus 0-3 on visual analogue scale). The post defecation pain was more with band ligation and so was rectal tenesmus ($p=0.0059$). The patients from the infrared coagulation group resumed their duties early (2 versus 4 days, $p= 0.03$). However, recurrence or failure rate was higher with the infrared coagulation group than the rubber band ligation group

($p= 0.03$). The study shows that band ligation is more effective ($P= 0.0019$) in controlling symptoms and obliterating hemorrhoids; it is associated with more pain ($p=0.0035$) and discomfort to the patient. As the infrared coagulation can be conveniently repeated in case of recurrence, it should be considered as the first line of therapy in early hemorrhoids.

Key Words: Hemorrhoids, Infrared Coagulation (IRC), Pain, Rubber Band Ligation (RBL).

Introduction:

Hemorrhoids or piles are a very common pathology. It is found in almost 50% of the people over the age of fifty who suffer from the disease in some or other form [1]. For early degree of hemorrhoids i.e. grade 1 and 2 (Milligan and Morgan's classification) many options have been put forth and tried [2]. The treatment procedures commonly adopted are injections of sclerosant solution (sclerotherapy) and rubber band ligation. The other procedures in practice include chemical destruction of pile mass by direct current probe (Ultroid), and thermal destruction with bipolar diathermy (Bicap), by cryoablation, and by infrared coagulation. In modern times, a fast and painless procedure that could be carried out in the office practice under local anesthesia will surely be preferred and accepted [3]. Infrared photocoagulation is found to fit the bill. The technique was introduced in the late seventies by Nath [4]. In infrared contact coagulation, the tissue is coagulated not by means of an electric current, but through infrared radiation [5].

Aim of the Study- The motive behind this study was to show that infrared photocoagulation is an effective, safe, and less painful alternative when compared to band ligation technique for treatment of early degree bleeding hemorrhoids.

Materials and Methods:

This study compared infrared coagulation (hereafter will be called as IRC) and rubber band ligation (hereafter will be called as RBL) in terms of post operative pain, time taken to resume routine work and effectiveness of the procedures. In this prospective, blinded study, 100 patients of 2nd degree bleeding hemorrhoids were chosen randomly. Infra Red Coagulation (IRC) was done in 50 patients and the remaining 50 patients were treated with Rubber Band Ligation (RBL). Blinding was done by sealed envelope, which was opened by the operation theatre nurse. The study was carried out at Gupta Nursing Home, Nagpur, between July 2000 and June 2001. Second degree bleeding pile is defined as hemorrhoid, which prolapsed during defecation, causes bleeding per rectum and gets reduced spontaneously after the act.

Exclusion criteria: Patients having associated fissure in anus, anal spasm or infective anal pathologies like cryptitis or proctitis were excluded from the study. Similarly, patients who refused to sign the informed consent were not included in the study. All of them received written explanation of the technique including potential drawbacks, such as relapses and a possible need for a repeat or a resort to another mode of treatment.

In these procedures, no anesthesia was given. However, 10 minutes before the procedure, 5% xylocain ointment was generously applied in the ano-rectum to reduce the sensitivity of the area.

Procedure: In most of the cases, lithotomy posture was preferred as it gave enough ease of maneuver. Left lateral position was opted in cases where lithotomy was not possible. All the pile bases were coagulated one after the other. There was no special preference for the positions of hemorrhoids to begin with; though the largest pile was dealt with first and so on. The mean treatment duration was 3 minutes, having ranged between 2 to 5 minutes. We have used the instrument from LUMATEC, Munchen, Germany. A light guide of 220mm with

a tip diameter of 6mm was used for the process of coagulation. IRC was done at all the three principle positions of hemorrhoids i.e. at 3, 7 and 11'O clock position. RBL was done at the similar places by in drawing the pile mass in the ligator and placing the band over the pedicle. Care was taken that the band should be placed above the dentate line. Patients were sent home 1 hour after the procedure. A regular dose of laxative was prescribed. Xylocain 5% ointment was prescribed for local application to relieve the post defecation discomfort and the possible burning sensation. None of the patients from either group was prescribed any analgesics. They were cautioned not to strain at stool and that they should expect little bleeding in the first week.

Complications: 2 patients from RBL group returned back within a day of the procedure with severe pain. The bands needed removal to provide relief. Another patient from RBL group reported with retention of urine. He was catheterized to relieve the retention. He did not report a similar complaint thereafter. Seven patients from IRC group complained of bleeding. This most frequently occurred during day 5 and day 10 of the procedure. The bleeding was associated with defecation. This was attributable to sloughing of the tissue at the base of hemorrhoids and oozing from the raw area thus created. 2 of the patients from RBL group had bleeding between 7th and 9th day. The reason of bleeding was possibly due to detachment of the pile mass from the pedicle.

Results:

One hundred patients were randomized prospectively to either the infrared coagulation or band ligation group. The follow up was carried out for a period of 12 months from the date of the procedure. Statistical Analysis- An unpaired student's t test was used to measure post operative parameters. The level of statistical significance between groups was set at 5 per cent.

Patient demographics: There was no significant demographic difference between the two groups. (Table- 1)

Table 1- Patient Demographics.

	Infra red coagulation (IRC)	Rubber Band Ligation (RBL)
No. Of Patients	50	50
Mean (range) age (years)	37 (20-68)	39 (19- 65)
Sex ratio (M: F)	36:14	34:16
Duration of disease (mean)	18 months	17 months.

The post procedure result is described in Table 2. (Fig. No. 1)

Post operative pain: The intensity and duration of postoperative pain in the first week was more in RBL than in IRC group (2-5 versus 0-3 on visual analogue scale). The duration of post defecation pain in the first ten days was significantly less in IRC group when compared with the RBL group which lasted for about 7 minutes in the IRC group and 19 minutes in RBL group. But thereafter, there was no significant difference as the pain was negligible in both of the groups.

Rectal Tenesmus: 9 patients from RBL group had rectal tenesmus at a follow up after one week, while only 2 patients in the IRC group had this finding. Time off work is defined as total period taken to return to the usual activity of domestic and social life at the discretion of the patient. Patients from IRC group could resume their routine comparatively early than their counterparts.

Sepsis: None of the patients from both of the groups had any sepsis in the form of local infection or systemic manifestation. After 1 year- At a follow up at 1 year of the procedures, 6 patients from the IRC group had recurrence of symptoms in the form of bleeding. 1 patient had recurrence of prolapse of piles. In similar comparison, 4 of the patients from RBL group had recurrence of bleeding. But none of them complained of any prolapse. The obliteration of the treated hemorrhoids, confirmed by anoscopy at the end of 1 year, was 80% in IRC group, while it was 92 % in RBL group.

Table 2- Results and differences between both methods.

EVENTS OBSERVED	INFRA RED COAGULATION (IRC)	RUBBER BAND LIGATION (RBL)	P
Intensity of post operative pain (First week)	2-5 on visual Analogue scale	0-3 on visual Analogue scale	0.2995
Period of post defecation pain	7 minutes	19 minutes	0.0035
Rectal Tenesmus	2 patients	9 patients.	0.0059
Time off work	2 days	4 days	0.0377
Obliteration of hemorrhoids	80%	92%	0.0019
Recurrence of bleeding	6	4	0.0377
Recurrence of prolapse	1	0	0.0955

Discussion:

The infrared coagulator works on the same principle as the CO₂ laser. This method has many advantages [6] for the treatment of hemorrhoids. The tissue damage that does occur with IRC is very superficial and is comparable to that which occurs with lasers. Even when repeated several times over, it is a safe and swift procedure.

INFRA RED COAGULATION vis-à-vis RUBBER BAND LIAGATION:

- 1) Both the treatments (IRC and RBL) are ambulatory.
- 2) The cost of each band is approximately 20 Indian rupee.
- 3) The cost of coagulation is limited to the acquisition of the coagulator, since it does not require any maintenance, except the normal care during disinfections and use. The running cost is minimum and only one new tungsten halogen bulb needed replacement during the last 5 yrs of our use of the instrument.
- 4) Although, rubber band ligation demonstrated greater long-term efficacy, it was associated with a significantly higher incidence of post treatment pain [7][8]. The most efficacious therapy, however, may not be the optimal one if the risks of potential complications outweigh the benefits of the treatment [9]. In contrast, infrared coagulation is associated with both fewer and less severe complications

[10].

5) No special training is required to carry out coagulation provided the area of coagulation is kept above the dentate line. While application of band needs expertise for placing the band at the right place, failing such placement can lead to complications like pain, strangulation of pile, necrosis, or even sepsis [11]. With the previous experience of RBL, some observers have even tried injection of local anesthetics on the post-banded pile mass to relieve the pain occurring after the procedure. This indicates that the pain intensity is much severe after the procedure than described [12]. The anatomical results after IRC suggest that the progressions of hemorrhoids and in most cases, the need for surgery, are prevented [13].

6) Band ligation is marked by a great number of complications of an inflammatory character. [14][15].

7) Rubber band ligation has been reported with life threatening complications like tetanus, liver abscess, pelvic cellulitis, rectovaginal fistula, and bacteremia. The septic complications are manifested with a clinical triad of pain, fever and retention of urine [16], [17], [18], [19], [20].

8) IRC is effective, inexpensive, and optimally patient-friendly [21].

9) IRC is also well tolerated by the younger patients with hyperactive anal sphincter, where rubber band ligation had reportedly caused considerable pain after therapy [22].

10) Pain after RBL occurs more often than previously recognized. It is suggested that informed consent be obtained before RBL and that patients should be given the opportunity to delay treatment if they so wish [23], [24].

Conclusion:

The study shows that infrared coagulation could be adopted as a safe and effective alternative to rubber band ligation, as it is quick, hassle free and safe. Save the initial cost of the instrument, there are no expenses of a recurring

nature. The application is easy and requires no special training. In comparison, it is better tolerated than the band ligation. It should be the first line therapy for early hemorrhoids.

References

1. Leff E. Hemorrhoids: Current approaches to an ancient problem. *Postgrad. Med.* 1987, 82:95-101.
2. Smith LE. Hemorrhoids. A review of current techniques and management. *Gastroenterol Clin North Am* 1987; 16: 79-91.
3. Arullani A, Cappello G, Diagnosis and current treatment of hemorrhoidal disease. *Angiology*. 1994 Jun; 45(6 Pt 2): 560-5
4. Nath G, the new principles of IRC in medicine and its physical fundamentals. *Coloproctology*, 1983; 379-81.
5. Pfenninger JL, Surrell J, Nonsurgical treatment options for internal hemorrhoids. *Am Fam Physician*. 1995 Sep 1; 52(3): 821-34,839-41.
6. Templeton JL, Spence RAJ, Kennedy TL. Comparison of infrared coagulation and band ligation for first and second-degree haemorrhoids. A randomized prospective clinical trial. *Br.Med.J*, 1983,286: 1387-9.
7. Russell TR, Donahue JH. Hemorrhoidal banding: a warning. *Dis Colon Rectum*, 1985; 28:291-3.
8. Vrzgula A, Bober J, Valko M, Franko J, Lukacova Z, Seginak V Rubber band ligation of hemorrhoids in ambulatory care. *Rozhl Chir* 2001 Jul; 80(7): 353-5
9. Johanson JF, Rimm A, Optimal nonsurgical treatment of hemorrhoids: a comparative analysis of infrared coagulation, rubber band ligation and injection sclerotherapy. *Am-J-Gastroenerol*. 1992 Nov; 87(11): 1601-6
10. Charua Guindic L, Avendano Espinosa O, Hernandez Cazares F. Infrared photocoagulation in the treatment of hemorrhoids *Rev Gastroenterol Mex* 1998 Jul-Sep; 63(3): 131-4
11. Bat L, Melzer E, Koler M, Dreznick Z, Shemesh E. Complications of rubber band ligation of symptomatic internal hemorrhoids. *Dis Colon Rectum* 1993 Mar; 36(3): 287-90.
12. Hooker GD, Plewes EA, Rajgopal C, Taylor BM. Local injection of bupivacaine after rubber band ligation of hemorrhoids: prospective, randomized study. *Dis Colon Rectum* 1999 Feb; 42(2): 174-9
13. Novah-El. The outpatient management of internal hemorrhoids by infrared coagulation. *Rev Med. Panama*, 1993. Sep., p18 (3); 166-70.

14. O'Hara VS. Fatal clostridial infection following hemorrhoidal banding. *Dis Colon Rectum* 1980; 23:570-1
15. Nikitin AM, Dul'tsev IuV, Chubarov-Iulu, Iakushin AV, Minbaev ShT. A comparative study of nonsurgical methods in the treatment of hemorrhoids. *Khirurgiia-Mosk.* 1992 Sept-Oct (9-10): 47-50.
16. Wochter DG, Luna GK. An unusual complication of rubber band ligation of hemorrhoids. *Dis. Colon Rectum* 1987; 30:137-40.
17. Shemesh EI, Kodner IJ, Fry RD et al. Severe complications of rubber band ligation of internal hemorrhoids. *Dis. Colon Rectum*, 1987; 30:199-200.
18. Quevedo-Bonilla G, Farkas AM, Abcarian H. et al. Septic complications of hemorrhoidal banding. *Arch Surg* 1988;123:650-1.
19. Clay LD III, White JJ Jr, Davidson JT, et al. Early recognition, and successful management of pelvic cellulitis following hemorrhoidal banding. *Dis. Colon Rectum* 1986; 29:579-81.
20. Scarpa FJ, Hillis W, Sabetta JR, Pelvic cellulitis: A life-threatening complication of hemorrhoidal banding. *Surgery*.1988; 103:383-5.
21. Czalbent HJ. Alternative therapeutic methods in the ambulatory treatment of hemorrhoids: observations with infrared coagulation *Orv Hetil* 1994 Apr 17; 135(16): 859-60.
22. Ambrose N.S, Morris D, Alexander Williams J, Keighley M.R.B. A randomized trial of photocoagulation or injection sclerotherapy for the treatment of first and second-degree hemorrhoids: *Disease of the colon and rectum* 1985,28:238-240.
23. Hardwick RH, Durdey P. Should rubber band ligation of haemorrhoids be performed at the initial outpatient visit? *Ann R Coll Surg Engl* 1994 May; 76(3): 185-7
24. Kumar N, Paulvannan S, Billings PJ. Rubber band ligation of haemorrhoids in the out-patient clinic. *Ann R Coll Surg Engl* 2002 May; 84(3): 172-4.

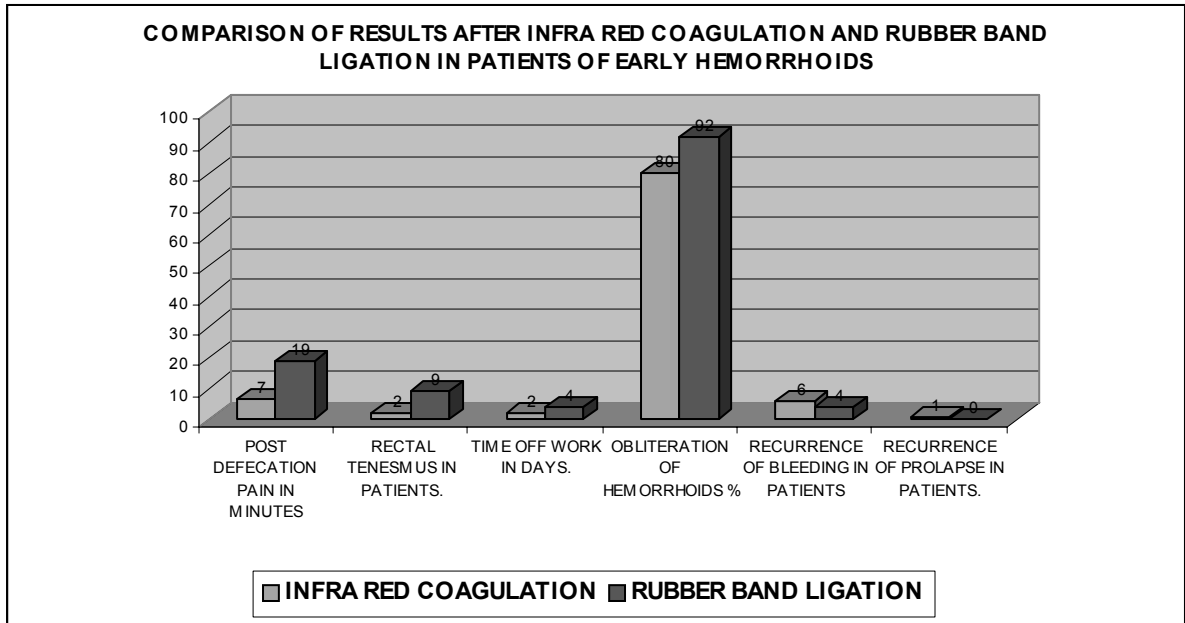


Fig. No. 1.

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