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Research Article

ROLE OF RUBBER BAND LIGATION AS A NON-INVASIVE TREATMENT IN HAEMORRHOID W.S.R. TO INTERNAL HAEMORRHOIDS

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ABSTRACT

In the present modern age, the majority of people are suffering from haemorrhoids. *Mithyaahara- Vihara* (faulty food habits and improper sedentary lifestyle) has increased its incidence. Internal haemorrhoid is situated internal to anal orifice, starts at anorectal ring and ends at the dentate line. Haemorrhoidectomy either open or closed is an invasive procedure for the treatment of hemorrhoids. A non-invasive measure for the treatment of haemorrhoids is Rubber Band Ligation. In this method, internal haemorrhoids are tied off at its base with rubber bands to cutting off blood flow resulting in necrosis of the haemorrhoidal stump. It relies on the principle of mucosal fixation. In the present clinical study Rubber Band, Ligation was done in randomly selected 15 patients of either sex with internal haemorrhoids. The duration of the trial was of 15 days, with a follow-up of 4 weeks. The total effect of therapy was assessed based on Clinical &Postoperative criteria. Statistical analysis has determined significance of the treatment. For all values significance level was $p<0.05$. In proctorrhagia percentage relief was 77.7% and results were highly significant while in prolapse percentage relief was 66.6% and the results were highly significant.Rubber band ligation has the advantages of no requirement of anesthesia, minimal hospitalization, and less postoperative pain. Hence after clinical study, it can be concluded that Rubber Band Ligation is a timely accepted effective treatment modality for complete relief of symptomatic internal haemorrhoids. Through a non-invasive approach, it cures internal haemorrhoids without disturbing normal haemorrhoidal cushion.

KEYWORDS: Haemorrhoids, *Arshas*, Rubber band ligation, Non-Invasive.

INTRODUCTION

Haemorrhoids are one of the commonest and troublesome diseases of ano-rectal region. Majority of people suffer from this disease irrespective of age, sex, socio-economic status. *Mithyaahar- Vihara* is the prime etiological factor gifted by busy lifestyle. According to *Acharya Sushruta (Su.Su. 33/4).*[1] *Arshas* is one of the *Mahagada* (fatal diseases), due to its *Dirghakaalanubandhi* (chronic course) and *Dushchikitsya* (difficult to treat) nature *(Su.Su. 33/5).*[2] *Guda* is stated as *Udar Marma (Su.Sa 6/6)*[3], *Mansa Marma (Su.Sa 6/7)*[4] and *Sadya Pranahara Marma (Su.Sa 6/9)*[5] by Sushruta, *Dhamani Marma* and *Kostha Marma* by Vagbhata *(A.H. Sa. 3/13)*[6]. *Arshas* is characterized by the presence of *Mamsankura* at the *Gudabhaga*. *Arshas* is a disease in which *Mansakeela* (muscular projections) discomforts the patient like an enemy and obstructs anal passage.[7]

अरिवत्प्राणिनोमांसकीलकाविषसन्ति यत्।
अर्षांसितस्मादुच्यन्तेगुदमार्गनिरोधतः।। (A.H.Ni. 7/1)

Haemorrhoids are dilated veins formed by the radicals of the superior, middle and inferior rectal veins within the anal canal in subepithelial region.[8] Rubber band ligation is a non-invasive procedure in which the hemorrhoids are tied off at its base with tight rubber bands without breaking anal skin or mucosa. These bands cut off the blood supply of the pile masses resulting in necrosis and ultimately fall off of the same resulting in a less painful procedure. Taking into consideration all the above said points this study was conducted to cure the patients of internal haemorrhoid with non-invasive measure of Rubber band ligation.

LITERARY SURVEY

Dilated plexus of superior haemorrhoidal vein in relation to anal canal is called as haemorrhoids.[9] Internal haemorrhoid is internal to anal orifice, commences at anorectal ring and ends at the dentate line.[10] There are several types of treatment available for internal haemorrhoids ex-

Injection treatment, Rubber band ligations, Manual dilatation and operative treatment (Formal Haemorrhoidectomy).[11] Rubber band ligation is comparatively non-invasive measure for haemorrhoidal treatment. It was originally proposed and practiced by Blaisdell in 1958. The rubber band ligature is applied through proctoscope to the mucosal covered part of the internal haemorrhoid. This elastic band gradually cuts through the tissue and the pile sloughs off spontaneously after 7 to 10 days.[12] For performing rubber band ligation no anaesthetic is required. In 1963 Barron claimed that it was an painless procedure.[13]

METHODOLOGY

MATERIALS AND METHODS

After detailed history and physical examination (*Asthavidha Pariksha* and *Dashavidha Pariksha*). Laboratory investigations were also carried out along with local rectal examination. Per rectal examination was carried out in proper position of patient by inspection (*Darshanpariksha*), palpation/digital examination (*Sparshanpariksha*) and proctoscopy. Written informed consent was taken from randomly selected 15 patients of either sex with complaint of internal haemorrhoids from OPD.

Inclusion criteria

1) Patients willing to undergo trial.
2) Patients of either sex between the aged 20 to 65 years.
3) Patients having the complaints of internal haemorrhoids.

Exclusion criteria

Patients were further screened through the following exclusion criteria before their inclusion in the study. Following are the exclusion criteria.

1. Patients not willing to undergo trial or not ready to give informed consent.
2. Patients of either sex, age less than 20 and more than 65 years.
3. Patients with uncontrolled systemic disorders like–Diabetes Mellitus, Tuberculosis, Uncontrolled Hypertension, Ischaemic Heart diseases.
4. Patients with any type of Endocrinal disorders and female patients having pregnancy.
5. Patients having severe Anaemia and evidence of Malignancy.
6. Rectal polyp in association with Crohn's disease, Ulcerative Colitis.

Clinical findings in each case were recorded in properly designed proforma. The study design was open, randomized, and prospective. The duration of the trial was 15 days with a follow up of 4 weeks.

The Technique of Rubber Band Ligation in Haemorrhoids

As per routine bowel preparation along with the local operative field Preoperative measures were done by cleaning, shaving, and painting. The procedure was done without anesthesia. In the Lithoto my position after draping for the revelation of Haemorrhoidal masses, Proctoscope with an external light source was passed through the anal canal. Two rubber bands were loaded on the inner tube. After loading of rubber bands loading part removed and the outer tube of the ligating part was worn over the inner tube exposing the tip of the inner tube protruded out. Thereafter, the handling part was further connected with a tube of the suction machine. The tip of the inner tube of the rubber band ligation gun was placed directly over the mucosal part of the prominent pile mass. Special care was taken to place a ligater atleast 1cm. above the pectinate line. Thereafter the hole of the handling part was occluded by using the right thumb and pressure with foot suction applied. At the suction pressure of about 25mm, the thumb was removed from the hole of the ligation part. Due to the release of suction pressure, the sliding of the outer tube of the handling part occurred. It caused the sucking of internal haemorrhoidal mass in the inner tube and slipping of rubber bands over the base of internal hemorrhoids. The resulting mass of strangulated tissue was about 1cm in diameter and the colour of the pile mass changed from pink to dark violet.The same procedure was done for other pile masses. After removal of the proctoscope a sterile pad was given.[14] Step wise technique of rubber band ligation is clearly shown in the Fig. 1 to Fig.8 on the patient of internal haemorrhoid.

Postoperative Management

A hot sitz bath, Bulk evacuant, and light diet were advised. The patient was advised not to strain during defecation. Daily *Jatyadi Taila matra vasti* was done.

Fig 1 Revelation of haemorrhoidal Masses)

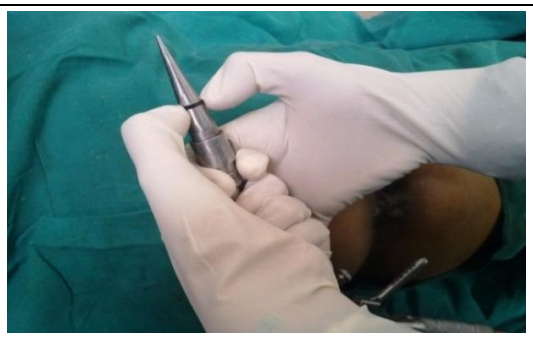

Fig 2 (Lodging of band overligator gun

Fig 3 (Connecting handling part with suction machine)

Fig 4 (Occlusion of the hole)

Fig 5 (Applying suction pressure)

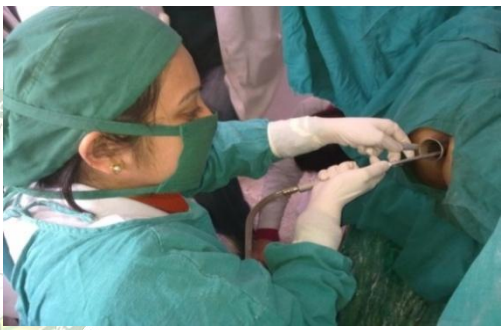

Fig 6 (Holding proctoscope with ligator gun)

Fig 7 (Release of suction pressure)

Fig 8 (After RBL - Colour changed)

Mechanism of Action of Rubber Band Ligation

The mechanism of action is simply mechanical, clear, and easy. Rubber Band Ligation is based on the principle of mucosal fixation and reduction of bulk of pile masses by complete or partial excision. After full-thickness ulceration the mucosa and the submucosal vascular cushions were fixed to the underlying muscle coat by creating scarring. Perivascular fibrosis finally produced in the submucosal plane also prevents engorgement of vessels, prolapse of sub-mucosal vascular cushion & reduces bleeding. The strangulated small haemorrhoidal tissue mass being about 1 cm held in elastic ligature results in the formation of a smaller wound by rapid falling out of pile mass. Application of Rubber bands over the base of the haemorrhoidal tissue causes pressure effects over the base and ischaemic changes in the distal part of the haemorrhoidal tissue which ultimately falls out after complete necrosis of the concerned haemorrhoidal mass. Thus, Rubber band ligation acts without disturbing normal haemorrhoidal cushion.

RESULTS AND ANALYSIS

Criteria for assessment: The following criteria were used for assessment.

(A) Clinical– Proctorrhagia, Prolapse, Discharge P/A, Pain, Heaviness in the anorectal region

(B) Postoperative

1. Postoperative pain- (recorded on days 1 and 15 after the operation)
2. Time taken for falling out of pile masses
3. Healing time after falling out of pile masses
4. Postoperative urinary complaints
5. Anal incontinence
6. Anal stenosis
7. Hospital stay (In days)

Criteria for assessing the total effect of therapy-

Grade 0-Deteriorated (Aggravation of the sign and symptoms)

Grade 1- Unchanged

Grade 2- Improved (Less than 50% relief of the complaints)

Grade 3- Markedly Improved (50% relief in complaints)

Grade 4- Cured (>80% relief in complaints)

Results of clinical study

1. Proctorrhagia– Percentage relief in was 77.7% and results were highly significant.
2. Prolapse– Percentage relief was 66.6% and the results were highly significant.
3. Pain– Percentage relief was 100%and non-significant.
4. Discharge per anum– Percentagerelief was 41.75% ($p < 0.05$) and significant only.
5. Heaviness in the anorectal region– Percentage relief was 54.97% with minimal significance.

Effect of Rubber band ligation on Clinical Criterions

S.No	Parameters	n	Mean		d	% age Relief	SD ±	SE±	t	p	Results
			BT	AT							
1.	Proctorrhagia	15	1.8	0.40	1.4	77.7	0.63	0.16	8.57	<0.001	HS
2.	Prolapse	15	2.46	0.80	1.6	66.6	0.25	0.06	31.0	<0.001	HS
3.	Pain	15	0.20	0.00	0.20	100	0.41	0.10	1.87	>0.05	NS
4.	Discharge peranum	15	0.80	0.46	0.33	41.75	0.48	0.12	2.64	<0.05	S
5.	Heaviness in Ano- rectal region	15	0.73	0.33	0.40	54.97	0.50	0.13	3.05	>0.001	MS

In above shown table n is the representative of no. of sample, BT–Before Treatment, AT–After treatment, d– difference, SD– Standard Deviation, SE-Standard Error, t-Difference (Calculated) represented in units of standard error, p- estimated probability of rejecting the null hypothesis, HS – Highly significant, NS– Non-significant and MS - Moderately significant (All the values are average values of 15 patients). As shown in above table the values clearly indicate the efficacy of the rubber band ligation methods on the set of patients.

Study of Postoperative Criteria

1. Postoperative pain (1st day)– Mean score was 0.53.
2. Postoperative pain (15th day)- Mean score was 0.00.
3. Time taken for falling out of pile mass – Mean score was 0.26. Rubber band ligation took less duration to shed off the pile masses.
4. Healing time after falling out of pile mass – Mean score was 0.80. Healing time after falling out of pile mass was significantly less after RBL.
5. Postoperative urinary complaints– Mean score was 0.13. No patient complained of postoperative urinary complaints on the 15th postoperative day.
6. Wound infection– Mean score was 0.06.
7. Anal incontinence- None of the patients developed anal incontinence.
8. Anal stenosis- This complication was not encountered.
9. Hospital stay– Mean hospital stay was 1.4 days. It indicates that patient after Rubber band ligation required a comparatively less hospital stay.
10. Type of anesthesia– In all the 15 patients, procedure was done without any anesthesia.

Total Effect of Therapy

According to the total effect of therapy 60% of patients were cured (>80% relief in complaints, complete healing of the wound), while 40% of patient were markedly improved (50% relief in complaints, more than 50% of the wound healing).

DISCUSSIONS

Rubber band ligation is useful in small haemorrhoidal masses of up to 2nd degree. It causes ischemic necrosis of the pile masses. Small tissue mass held in elastic ligature resulted in immediate complete ischemia resulting in rapid falling out of pile mass. It is a comparatively painless procedure pre and postoperatively. Ligation of internal haemorrhoids was done at the base of haemorrhoids

1cm. above the dentate line, which is pain insensitive mucosa due to autonomic innervations. Mild pain was experienced only due to multiple ligations conducted on the same day. Patients underwent with rubber band ligation without any anaesthetic requirement. As an OPD procedurewith the less hospital stay patients can be discharged on the same day. Anal incontinence was also not reported in any patient.

CONCLUSIONS

Sedentary lifestyle was an important cause for the development of haemorrhoids. Rubber band Ligation dealt with internal haemorrhoidal components. Prolapse and Proctorrhagia (Chief clinical complaints of hemorrhoids) can almost completely be cured after RBL. Rubber band ligation is also an effective non-invasive treatment for complete relief from the symptoms of internal hemorrhoid. Rubber band ligation has the advantages of minimum hospitalization, less pain, cost-effectiveness, and very useful in early internal hemorrhoids.

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