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A Study on Recto Anal Repair in grade 3 and 4 Hemorrhoids without Doppler Guidance

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ABSTRACT
Hemorrhoids are the most common benign anorectal diseases. Recto Anal Repair (RAR) without doppler guidance is a relatively cost-effective procedure for treatment of Grade 3 and Grade 4 hemorrhoids. In this study, we evaluate the Safety and efficacy of RAR without doppler guidance in treating Grade 3 and Grade 4 hemorrhoids. We conducted a Retrospective Randomised Observational study on total of 100 patients of Grade III and IV hemorrhoids who treated by Recto anal repair without doppler guidance. A visual analogic scale (VAS) was used to measure postoperative pain. Outpatient follow-up at 15 days, 1 month, 3 months and 1 year was recorded. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23. Among the studied patient's males were in predominance (79.0%) and the mean age was 47.0±13.5 years. Postoperative VAS score of pain was reduced significantly to 0.0±0.0 at 3 months from 3.2±0.7 at 24 hours ($p<0.001$) and the mean hospital stay was 3.2±0.6 days. Majority postoperative complication was found Localized Edema in 14.0% of patients. Bleeding in 6.0% patients and prolapse in 3.0% of patients had occurred as recurrence of symptoms. One year subsequent to treatment with RAR, only in grade IV 2 (3.6%) cases were having chronic pain. We observed that RAR without doppler guidance is a simple, safe and cost-effective ambulatory treatment for the patients of symptomatic haemorrhoids. It might be considered for the treatment of grades 3 and 4 hemorrhoids effectively.

INTRODUCTION

One of the most common referrals to surgical outpatient departments is hemorrhoidal disease. Global prevalence is 2.9-50.0%. People often develop symptoms, but 20.0-30% seek medical attention. It is more prevalent among young men between 45-65 years old[1,2]. In men, hemorrhoids form discrete masses of thick sub-mucosa containing blood vessels, smooth muscles, elastic and connective tissues in the anal canal 2-3 times more frequently than in women. Mostly, they develop at 3 o'clock, 7 o'clock and 11 o'clock. Secondary hemorrhoids may also develop adjacent to these primary positions. Constipation, straining, prolonged squatting, nutrition, pregnancy, aging, hereditary factors, portal hypertension and abdominal tumors all contribute to hemorrhoids[3]. Surgical treatment for hemorrhoids can be broadly divided into the classic surgical procedures and minimally invasive techniques. The classic surgical procedures still commonly used and considered to be the gold standard are the open hemorrhoid removal (Milligan-Morgan technique) and the closed hemorrhoid dissection (Ferguson technique)[4].

Over the last few decades, minimally invasive treatments have become more popular in coloproctology as well. Morinaga *et al*. first described Doppler-guided haemorrhoidal artery ligation (DG-HAL) in 1995[5]. As a result of ligating the proximal submucosal haemorrhoidal arteries, blood flow to the haemorrhoidal cushions is reduced, leading to fibrosis and shrinkage. For grade 2 and 3 haemorrhoidal disease, haemorrhoidal artery ligation (HAL) has been examined in several studies, which have shown excellent results. Despite the fact that HAL seems to be effective in controlling pain, bleeding, pruritus and mucous discharge, controlling prolapse seems more difficult in patients with grade 3 and 4 haemorrhoids. Studies have shown that patients with grade III disease have persistent or recurrent prolapse rates of 6, 9 and 14%[6-8]. Patients with grade IV disease have recurrence rates (RRs) that are 24-67% higher[6-8].

Haemorrhoidal cushions are difficult to remove from these patients, especially those experiencing grade IV haemorrhoids. Recto-anal repair (RAR), a technique developed and described by Scheyer[9], addresses this problem by supplementing HAL with a further step, whereby the haemorrhoidal tissue is gathered up and lifted back into position. Based on this principle of tissue reduction, RAR is an alternative to surgical removal that is made possible by placing a longitudinal running suture while using a specially designed proctoscope. Our Centre (Kamalnayan Bajaj Hospital, Aurangabad, Maharashtra) is a referral Centre, patients from all over the state and even outside the State are referred here, majority of the patient visit the Colorectal Department seeking treatment for hemorrhoids. Majority of the patient belong to middle and lower socioeconomic class. Recto Anal Repair without doppler guidance is a relatively cost-effective procedure for treatment of Grade 3 and Grade 4 hemorrhoids. It doesn't require any costly specialized instruments.

The purpose of this retrospective study was to observe how clinically relevant parameters of high-grade hemorrhoids developed in terms of recurrence of the prolapse and complications without doppler guidance over a period of one year subsequent to treatment with RAR.

MATERIALS AND METHODS

The present study was conducted in the Department of General Surgery, Kamalnayan Bajaj hospital, Aurangabad, Maharashtra from From July 2020 to December 2020 with follow up for 1 year after taking proper permission from institutional ethics committee and scientific committee. We conducted a Retrospective Randomized Observational study on total of 100 patients of Grade III and IV hemorrhoids who treated by Recto anal repair without doppler guidance. Simple randomization was used, cases operated were enlisted according to hospital MR number and every 3rd patient was selected for the study.

All patients of ages above 18 years and below 70 years of both sexes with prolapsing hemorrhoids which either had to be reducible manually (IIIrd grade) or could not be manually reduced (IVth grade). All the patients of RAR were treated on Indoor basis and after discharge they are routinely called for follow up visit on 15th day 1 month, 3 months and also a follow up at around 1 year were included in the study. Patients using anticoagulants, previous perianal surgeries, Grade I and II haemorrhoids, Incomplete Data were excluded.

Procedure: All the cases who presented with symptomatic hemorrhoid disease were preoperatively evaluated by routine investigations like complete blood picture, bleeding time, clotting time, blood urea, blood sugar and serology

Operative procedure

Recto Anal Repair: The procedure was performed under spinal or general anesthesia with the cases in the left lateral position. After cleaning the perineal skin region and covering the patient with sterile draping, the anal canal was gently dilated by the passage of two fingers. A Proctoscope was inserted to examine the sites of hemorrhoidal cushions, with clear exposure of the dentate line and displaced rectal mucosa, Babcock

forceps was applied to the external skin tags corresponding to the three primary hemorrhoids and pulled to visualize the corresponding internal hemorrhoid vascular cushion. The pedicle of the hemorrhoids was visualized. Then the hemorrhoid pedicle was transfixed and ligated with vicryl on round body needle in order to occlude the superior hemorrhoidal vessel as they enter the internal hemorrhoids. The mucopexy secures the hemorrhoidal prolapse into the anal canal. Technically, the mucopexy begins with the placement of a running suture that starts proximally and ends distally. The distal part of the hemorrhoid was then pushed back into the anal canal and the hemorrhoid was secured back in into place by knotting the two ends of the absorbable suture. The running suture was completed some 5 to 8 mm above the dentate line to ensure pain levels remain low. Once the most distal stitch was made, the needle was cut off and the end of the suture knotted to the other end which remained proximal. Using the index finger or a knot pusher, the knot was pushed upwards and the prolapsing mucosa pulled back into the anal canal the procedure repeated at 7 O clock position, 11 O clock and at 3 O clock position sequentially.

Thus, in effect the prolapsing hemorrhoid are lifted up and fixed back to the lower rectum. By ligating the arteries using the HAL method and subsequently carrying out step two of the RAR procedure, the mucopexy, the blood inflow to the hemorrhoidal cushions was reduced. The widespread network of arteries was partly blocked, however, the remaining arteries still provide more than enough blood to the area. A visual analogic scale (VAS) was used to measure postoperative pain, ranging from no pain (VAS: 0) to the worst pain imaginable (VAS: 10) (obtained from record). Outpatient follow-up at 15 days, 1 month, 3 months and 1 year was recorded, at every follow-up cases were examined by an expert doctor and details were documented on patient case record paper which includes.

- Pain (VAS)Score
- Postoperative prolapse component
- Bleeding per rectum
- Fecal incontinence
- Anal canal stenosis

Post-Operative Outcome and Complications were Seen on the Basis of: At follow up, outcome assessments included:

- Effectiveness of the Procedures, which was Classified as:
  - Clinical symptoms completely resolved (absence of clinical symptoms Bleeding, Pain, Prolapse, significant shrinkage, or disappearance of hemorrhoids)
  - Partially resolved (improved clinical symptoms but Presence of one or >1 clinical symptom (Bleeding, Pain, Prolapse), only mild shrinkage of hemorrhoids)
  - Persistent symptoms (no improvement in clinical symptoms)

- Post-operative recurrence of prolapsing hemorrhoids and bleeding (Recurrence is seen only after 1 year subsequent to treatment with RAR without doppler guidance)
- Duration of hospitalization
- Immediate Postoperative complications, including bleeding, anal discomfort, urinary retention, localized edema and fecal incontinence
- Long term complications which include anal canal stenosis, chronic pain and fecal incontinence

Statistical Analysis: Microsoft Excel was used in creating the database and producing graphs, while the data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 for Windows. Demographic data presented as mean±standard deviation or crude numbers with frequency. A $p<0.05$ was considered significant.

RESULTS AND DISCUSSIONS

Among the studied patients' males were in predominance (79.0%) and the mean age was 47.0±13.5 years and the majority of the studied patients were from low socio-economic status (73.0%). Mass coming out of anus (100.0%) followed by bleeding (100.0%) and constipation (87.0%) were the common complaints (Table 1). Postoperative VAS score of pain was reduced significantly to 0.0±0.0 at 3 months from 3.2±0.7 at 24 hours ($p<0.001$) whereas the mean hospital stay was 3.2±0.6 days (Table 2). Majority postoperative complications was found Localized Edema (14.0%) followed by urinary retention (5.0%), bleeding (4.0%) and anal discomfort (3.0%) (Fig. 1). Bleeding in 4.0% patients and prolapse in 3.0% of patients had occurred as recurrence of symptoms (Table 3). It was found that Symptoms got completely resolved in 95.5% of cases with grade III hemorrhoids and in 92.8% of cases with grade IV hemorrhoids whereas there were no patients with persistent symptoms in 3 and 4 grade group has 3.5% patient with persistent symptoms at 1 year follow up but the difference was statistically insignificant at all follow up periods ($p>0.05$) (Table 4). One year subsequent to treatment with RAR it was found that none of the

Fig. 1: Image showing prolapsed component of hemorrhoid before (RAR) procedure

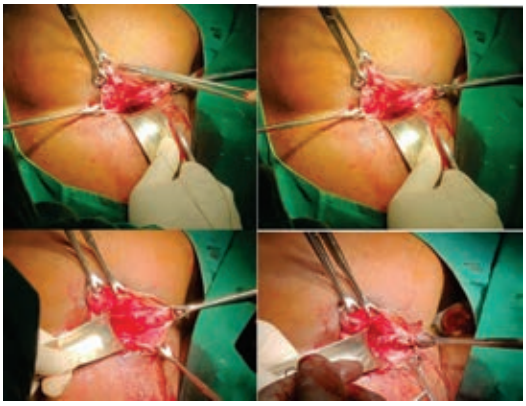

Fig. 2: Procedure of suture-fixation mucopexy (RAR) without doppler guidance

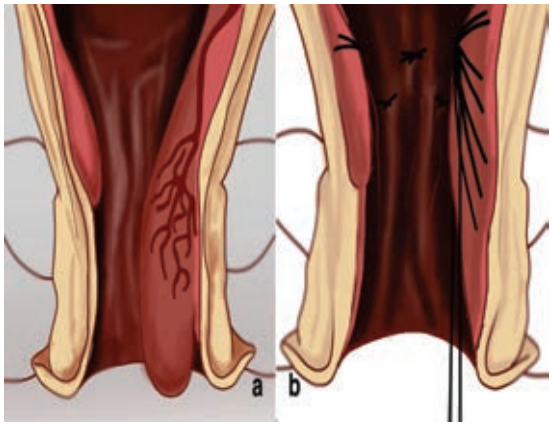

Fig. 3: 2(a-b)Animated depiction of Recto Anal Repair (RAR), Prolapsed haemorrhoid, Running suture starting 2-3 cm and finishing 5 mm above the dentate line lifting prolapsed hemorrhoid.

cases had fecal incontinence or anal canal stenosis only in grade IV 2 (3.6%) cases were having chronic pain

Fig. 4: Post Operative image after suture-fixation mucopexy (RAR) without doppler guidance

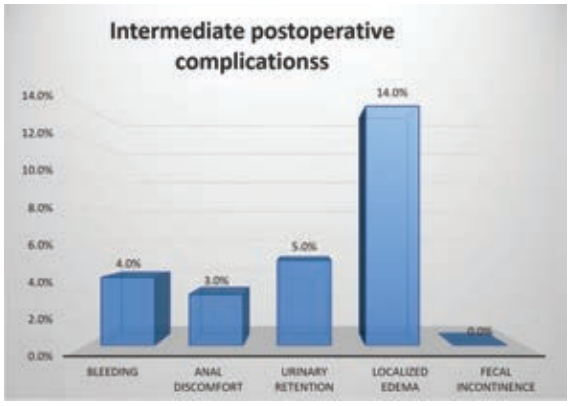

Fig. 5: Postoperative Complications

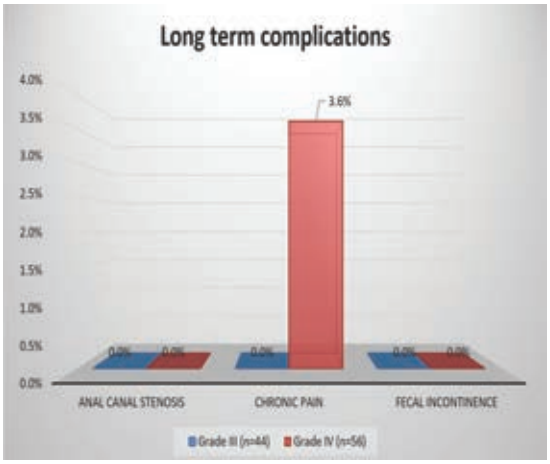

Fig. 6: Long term complications (one year postoperatively)

(Fig. 2). While a variety of treatment options is available for grade I and II haemorrhoids, only stapled haemorrhoidopexy (SH) and conventional haemorrhoidectomy (CH) are considered to be a

Table 1: Distribution of demographic and clinical profile of studied patients

Parameters		No. of cases (n=100)	Percentage
Mean Age (years)		47.0±13.5 years	
Gender	Male	79	79.0
	Female	21	21.0
Socio economic status	High	27	27.0
	Low	73	73.0
Presenting Complain	Pain	34	34.0
	Bleeding	89	89.0
	Constipation	87	87.0
	Mass coming out of anus	100	100.0
Grades of Hemorrhoids	III	44	44.0
	IV	56	56.0
Rectal Findings	Prolapse	100	100.0
	Reducibility	44	44.0
	Spasm	36	36.0

= Mean±SD

Table 2: Postoperative pain parameter and mean hospital stay.

Parameters		No. of cases (n=100)
VAS Score#	24 hours	3.2±0.7
	15 days	0.8±0.7
	1 Month	0.2±0.5
	3 Month	0.0±0.0
	1 Year	0.0±0.0
Mean Hospital Stay (days)		3.2±0.6 days

= p<0.001

Table 3: Recurrence of symptoms one year subsequent to treatment with RAR

Recurrence of Symptoms	No. of patients (n=100)	Percentage
Prolapse	3	3.0
Bleeding	4	4.0
Bleeding+Prolapse	3	3.0

Table 4: Effectiveness of the procedure

	Grade III (n = 44)			Grade IV (n = 56)			
Effectiveness of procedure	**PR**	**CR**	**PS**	**PR**	**CR**	**PS**	**p-value**
15 days	14 (31.8)	29 (65.9)	1 (2.3)	30 (53.6)	25 (44.6)	1 (1.8)	0.182
1 Month	2 (4.5)	41 (93.2)	1 (2.3)	7 (12.5)	48 (85.7)	1 (1.8)	0.355
3 Months	1 (2.3)	42 (95.5)	1 (2.3)	3 (5.3)	51 (91.1)	2 (3.5)	0.067
1 Years	1 (2.3)	42 (95.5)	1 (2.3)	2 (3.5)	52 (92.8)	2 (3.5)	0.067

C.R.-symptoms completely resolved (absence of clinical symptoms, significant shrinkage, or disappearance of hemorrhoids),P.R.- symptoms partially resolved (improved clinical symptoms, mild shrinkage of hemorrhoids), P.S.-persistent symptoms (no improvement in clinical symptoms)

standard treatment for grade III disease and just CH in the case of grade IV. In a meta-analysis[10], the RR for prolapse following CH is reported to be 4%. However, both treatment options can be associated with extensive post-operative pain[11], fecal incontinence and anal stenosis[12]. Nonetheless, for most authors CH remains the standard treatment for advanced piles, because novel techniques including SH do not show the same effectiveness. Although initial results from single centres have been promising[7,9,13] RAR without DG has not yet been adequately evaluated for grade III and IV haemorrhoids. The retrospective study was to observe how clinically relevant parameters of high-grade hemorrhoids developed in terms of recurrence of the prolapse and complications without doppler guidance over a period of one year subsequent to treatment with RAR. In the present study the majority of the studied cases were males (79.0%) and the mean age of the cases was 47.0±13.5 years. 73.0% cases were from low socioeconomic status. These findings were in line with studies as conducted by Lopez *et al*[14], Saxena and Bhakuni[3] and Theodoropoulos GE *et al*[15]. In our study the presenting complaints were mass coming out of anus (100.0%), followed by bleeding (89.0%), constipation (87.0%) and mild pain in 34.0% and where 44.0% cases have grade III hemorrhoids whereas 56.0% have grade IV hemorrhoids. These findings were in accordance with the findings of Theodoropoulos *et al*[15] who reported grade III in 95, grade IV in 52 cases presenting with bleeding (73.0%) and prolapse (62.0%). Saxena and Bhakuni[3] reported that most common symptoms was (100.0%) bleeding per rectum. Palpable mass at anal verge, pain during defecation, mucous discharge, pruritis, constipation and anemia related symptoms. De A and Roy P[4] reported that the most frequently reported symptoms were bleeding in 85.0% and prolapse in 56.0%. Post-operative VAS score of pain was reduced significantly to 0.0±0.0 at 3 months from 3.2±0.7 at 24 hours (p<0.001) whereas the mean hospital stay was 3.2±0.6 days. Similarly, De A and Roy P[4] reported the postoperative pain assessed on Visual analog score was 2.82 on 3rd day, 1.28 on 7th day and till 14th day was extremely low. Saxena P and Bhakuni YS[3] found postoperative pain assessed on Visual analog score was 2.82 on 3rd day, 1.28 on 7th day and till 14th day was extremely low. Studies reported the postoperative pain in cases was lower

until the 15th 14th and 30th postoperative day with statistically significant differences (p<0.05). We found that the recurrence of symptoms one year subsequent to RAR is as follows, bleeding occurs in 4.0% cases and prolapse in 3.0% whereas Bleeding with Prolapse recurred in 3.0% cases. Our findings were consistent with the findings of Satzinger *et al* who observed the recurrence of prolapse at 12 months was low, with no re-prolapse being recorded in 89.0% of the cases. After long-term follow-up, 24.0% of cases reported prolapsing piles, 3.0% bleeding, 3.0% pruritus and 2.0% anal pain, while 20.0% complained of persistent mixed symptoms. Hoyuela *et al*[16] found that after 24 months follow-up, recurrence of bleeding and prolapse was observed in only 1 case.

It was found that one year subsequent to treatment with RAR without doppler guidance Symptoms got completely resolved in 95.5% of cases with grade III hemorrhoids and in 92.8% of cases with grade IV hemorrhoids, whereas there was 1 (2.3%) case with persistent symptoms in grade III group at 1 month, 3 month and 1 year follow up whereas in grade IV group persistent symptoms was in 1 (1.8%) at 15 days and 1 month follow up while 2 (3.5%) had persistent symptoms at 3 month and 1 year follow up but the difference was statistically insignificant at all follow up periods (p>0.05). According to Hoyuela *et al*[16] and Theodoropoulos GE et al15 reported more than 90% of patients were satisfied with HAL-RAR. Satzinger *et al*[17] reported RAR as an effective form of treatment for high-grade hemorrhoids. Lopez FC et al14 reported that compared with the HAL-RAR group (15.0%), the symptom persistence rate at the 15th postoperative day was significantly higher (p = 0.03) in the Hemorrhoidectomy group (45.0%). At 1 month, compared with 3 patients in the hemorrhoidectomy group (15.0%), 1 patient (5.0%) in the HAL-RAR group had persistent symptoms, but this difference was not significant. At 6 months, both techniques had the same effectiveness in controlling symptoms with 5.0% persistence. Zhai *et al*[18] reported that at 24 months, the percentage of recurrent prolapsing hemorrhoids (7.0% versus 23.8%, p = 0.03) or bleeding (2.3% versus 19.0%, p = 0.03) was significantly lower in suture-fixation group than in DGHAL group. At both 12 and 24 months, ratings of patient's satisfaction were significantly higher (rated as excellent or good) in suture-fixation. In present study the long term complications were observed in one year postoperatively between grade III and grade IV hemorrhoids and it was found that none of the cases had fecal incontinence or anal canal stenosis only in grade IV 2 (3.6%) cases were having chronic pain but the difference was statistically insignificant (p>0.05). Lopez *et al*.[14] reported that due to the lesser degree of postoperative pain observed in the HAL-RAR group and the absence of serious complications, the outpatient treatment of hemorrhoids grades III and IV could be incorporated into ambulatory surgery programs. Scheyer *et al*.[8] reported 24.0% of cases of recurrent or persisting prolapsing piles, 3.0% bleeding episodes, 3.0% pruritus and 2.0% anal pain, while 20.0% complained of persistent mixed symptoms after long term follow-up. Theodoropoulos *et al*[15] first published results from a 15-month follow-up of RAR patients; RAR improves the clinical outcome for residual prolapse compared to HAL due to the positive effects of additional mucopexy.

The advantage as we observed was simplicity of the procedure, less postoperative pain, insignificant bleeding during the procedure and postoperatively and no need for costly and specialized instruments like Barron band ligator or Doppler ultrasound so it is cost effective. There are no major post operative complications like fecal incontinence (0.0%), only 5.0% of cases had urinary retention which was managed by foleys catheterization, 4.0% of cases had bleeding postoperatively but it was minor bleed and none of the cases required post operative blood transfusion, no major long-term complications like fecal incontinence or anal canal stenosis. This study has some limitation, relatively smaller sample size and short follow up. An analysis of post-operative complications like incontinence on long term would also need to be assessed. A multi-centre trial with a larger case sample would be needed to address the limitations

CONCLUSION

In conclusion we observed that RAR without doppler guidance is a simple, safe and cost-effective ambulatory treatment for the patients of symptomatic hemorrhoids. It can be performed on both grade 3 and grade 4 hemorrhoids, with a short duration of stay in the hospital i.e., 3.2±0.6, it has a low recurrence rate and no major immediate post operative or long-term complications. RAR without doppler guidance is an effective form of treatment for high-grade hemorrhoids and should be considered as an effective first treatment option for high grade hemorrhoids.

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