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### Original Research

# Prospective Randomized Comparative Study of DGHAL And TRANSANAL Suture Rectopexy In Symptomatic Hemorrhoids

Dr. Gautam Bhaumik<sup>1\*</sup>, Dr. Kushankur Guha<sup>2</sup>, Dr. Arunava Jana<sup>3</sup>

<sup>1</sup>Associate Professor, Department of General Surgery, MS (Cal) DNB (65) FRCS (EDIN) FRES (ELASGOW), FIAGES, KPC Medical College & Hospital, Jadavpur, Kolkata, West Bengal 700032.

<sup>2</sup>Assistant Professor, MBBS, MS, FMAS, FIAGES, Fellowship in Robotic Surgery, KPC Medical College & Hospital, Jadavpur, Kolkata, West Bengal 700032.

<sup>3</sup>Senior Resident, M.S. (General Surgery), FMAS (Minimal Access Surgery), Department of General Surgery, KPC Medical College & Hospital, Jadavpur, Kolkata, West Bengal 700032

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### Abstract

**Introduction:** Hemorrhoidal disease is one of the most common anorectal disorders worldwide, affecting up to 50% of adults by the age of 50. It results from the pathological enlargement and distal displacement of the anal cushions, coupled with vascular hyperplasia, increased arterial inflow, and impaired venous drainage. **Aims:** To compare the efficacy and safety of Doppler-guided hemorrhoidal artery ligation (DGHAL) versus transanal suture rectopexy in patients with symptomatic hemorrhoids, evaluating postoperative outcomes and complications. **Materials & Methods:** The study was a prospective randomized comparative study conducted at KPC Medical College & Hospital, Kolkata, from 1st February 2023 to 31st January 2024, including a total of 194 patients with symptomatic hemorrhoids. **Result:** In our study 30 day postoperative events were comparable between the two groups with no statistically significant differences observed. Readmission within 30 days occurred in 4 patients (4.1%) following DGHAL and in 10 patients (10.3%) in the transanal suture rectopexy group ( $p = 0.165$ ). Surgical reintervention was required in 3 patients (3.1%) in the DGHAL group compared with 9 patients (9.3%) in the transanal group ( $p = 0.136$ ). **Conclusion:** We concluded that both dghal and transanal suture rectopexy were successful in reducing symptoms in this prospective randomized comparative trial of 194 patients with bothersome hemorrhoids. Transanal suture rectopexy, on the other hand, was linked to longer operating times, greater intraoperative blood loss, and slower early postoperative recovery, including more pain and delayed bowel movements.

**Keywords:** Hemorrhoids, DGHAL, Transanal suture rectopexy, Operative time, Pain management and Patient recovery

### Introduction

Hemorrhoidal disease is one of the most common anorectal disorders worldwide, affecting up to 50% of adults by the age of 50 [1]. It results from the pathological enlargement and distal displacement of the anal cushions, coupled with vascular hyperplasia, increased arterial inflow, and impaired venous drainage [2]. Traditional excisional procedures, such as Milligan-Morgan hemorrhoidectomy, remain the gold standard for treating advanced hemorrhoids (Grade III-IV) but are associated with significant postoperative pain, longer recovery periods, and wound-related complications [3]. This has driven the development of minimally invasive techniques that aim to reduce morbidity while effectively controlling symptoms. Doppler-guided hemorrhoidal artery ligation (DGHAL) is a minimally invasive procedure designed to selectively ligate terminal branches of the superior hemorrhoidal artery under Doppler guidance [4]. By interrupting arterial inflow, DGHAL reduces the size and bleeding of hemorrhoids without excising tissue. Early studies reported favorable outcomes, including minimal postoperative pain, shorter hospital stay, and good symptom relief. However, long-term recurrence remains a concern, with follow-up studies indicating recurrence rates ranging from 10-15%. Meta-analyses suggest that while DGHAL is safe and effective, its superiority over other non-excisional techniques in terms of recurrence and operative outcomes remains inconclusive. To address prolapse as well as vascular congestion, modifications such as Recto-Anal Repair (RAR) combine DGHAL with mucopexy, elevating and suturing the prolapsed mucosa [5]. While effective in selected patients recurrence rates up to 40% at one year have been reported in some series. This has led to exploration of alternative approaches that can simultaneously reduce arterial inflow and correct mucosal prolapse. Transanal suture rectopexy, also known as Chivate's procedure, was first described by Chivate et al. in 2006 [6].

Address for Correspondence: Gautam Bhaumik, Associate Professor, Department of General Surgery, MS (Cal) DNB (65) FRCS (EDIN) FRES (ELASGOW), FIAGES, KPC Medical College & Hospital, Jadavpur, Kolkata, West Bengal 700032.

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This technique involves reducing the hemorrhoidal mass and transfixing suturing of the rectal mucosa and submucosa to the underlying muscular layer, typically 2-4 cm above the dentate line. This approach simultaneously provides fixation of prolapsed tissue and partial vascular ligation, addressing both key aspects of hemorrhoidal pathology. Initial studies demonstrated minimal postoperative pain, short hospital stay, and excellent functional outcomes, with no significant incontinence or tenesmus reported. A multicenter study over 13 years involving 5,634 patients reported a recurrence rate of just 1.3%, highlighting its long-term efficacy and safety. Additionally, the technique is cost-effective, requiring only standard suture materials and a proctoscope. Study aims to compare the efficacy and safety of Doppler-guided hemorrhoidal artery ligation (DGHAL) versus transanal suture rectopexy in patients with symptomatic hemorrhoids, evaluating postoperative outcomes and complications.

## Materials and Methods

**Type of Study:** Prospective randomized comparative study.

**Place of Study:** KPC Medical College & Hospital, Kolkata

**Study Duration:** From 1st February 2023 to 31st January 2024

**Sample Size:** 194 symptomatic hemorrhoid patients

### Inclusion Criteria:

- Adults aged 18-70 years diagnosed with symptomatic hemorrhoids requiring surgical intervention.
- Patients with Grade II-IV hemorrhoids or recurrent hemorrhoids after conservative treatment.
- Patients willing to provide written informed consent and comply with follow-up.

### Exclusion Criteria:

- Patients with bleeding disorders or on anticoagulant therapy.
- Patients with inflammatory bowel disease, anorectal malignancy, or previous anorectal surgery.
- Pregnant or lactating women.
- Patients unfit for surgery due to severe systemic illness (ASA grade III-IV).
- Patients refusing consent or unlikely to complete follow-up.

### Study Variables:

- Transanal Suture Rectopexy
- Postoperative pain
- Symptom relief
- Recurrence rate of haemorrhoids
- Operative duration
- Intraoperative blood loss

### Statistical Analysis:

Data were entered into Excel and subsequently analyzed using SPSS and GraphPad Prism. Continuous variables were summarized as means with standard deviations, while categorical variables were presented as counts and percentages. Comparisons between independent groups were performed using two-sample t-tests, and paired t-tests were applied for correlated (paired) data. Categorical data were compared using chi-square tests, with Fisher's exact test applied when expected cell counts were small. A p-value of  $\leq 0.05$  was considered statistically significant.

## Results

**Table 1: Baseline demographics**

| Variable                                  | DGHAL             | Transanal         | p-value |
|-------------------------------------------|-------------------|-------------------|---------|
| Age (years)                               | 45.29 $\pm$ 10.04 | 47.14 $\pm$ 11.76 | 0.243   |
| Male                                      | 56 (57.7%)        | 52 (53.6%)        | 0.665   |
| BMI (kg/m <sup>2</sup> )                  | 26.07 $\pm$ 3.05  | 26.32 $\pm$ 3.06  | 0.562   |
| Hemorrhoid grade III / IV n               | 64 / 33           | 60 / 37           | 0.654   |
| Duration of symptoms, median (IQR) months | 18 (8-36)         | 20 (9-40)         | —       |

**Table 2: Operative details**

| Variable                  | DGHAL          | Transanal       | p-value |
|---------------------------|----------------|-----------------|---------|
| Operation time (minutes)  | 39.4 $\pm$ 7.5 | 64.9 $\pm$ 14.0 | <0.001  |
| Estimated blood loss (mL) | 50 $\pm$ 20    | 80 $\pm$ 30     | <0.001  |
| Conversion to open        | 0 (0%)         | 1 (1.0%)        | 0.317   |
| Intra-op complications    | 2 (2.1%)       | 3 (3.1%)        | 0.682   |

**Table 3: Early postoperative outcomes**

| Outcome                      | DGHAL           | Transanal       | p-value |
|------------------------------|-----------------|-----------------|---------|
| Pain VAS POD1                | 3.05 $\pm$ 0.97 | 4.26 $\pm$ 1.14 | <0.001  |
| Time to first bowel movement | 1.6 $\pm$ 0.8   | 2.1 $\pm$ 1.0   | <0.001  |
| Postop bleeding              | 5 (5.2%)        | 9 (9.3%)        | 0.405   |
| Urinary retention            | 8 (8.2%)        | 12 (12.4%)      | 0.479   |
| Wound/anal infection         | 2 (2.1%)        | 3 (3.1%)        | 1       |

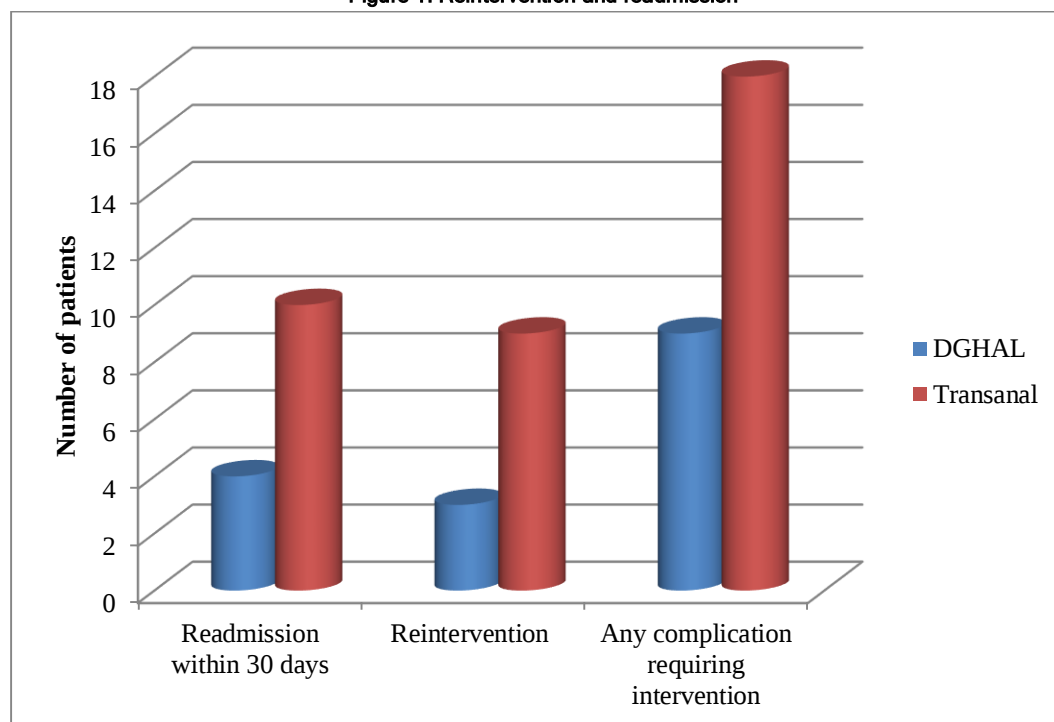
Table 4: Late outcomes at 12 months

| Outcome                      | DGHAL       | Transanal    | p-value |
|------------------------------|-------------|--------------|---------|
| Clinical recurrence          | 6 (6.2%)    | 14 (14.4%)   | 0.098   |
| Persistent prolapse          | 4 (4.1%)    | 8 (8.2%)     | 0.205   |
| New-onset fecal incontinence | 3 (3.1%)    | 5 (5.2%)     | 0.472   |
| Patient satisfaction         | 68 / 22 / 7 | 60 / 24 / 13 | 0.303   |

Table 5: Reintervention and readmission

| Outcome                                 | DGHAL    | Transanal  | p-value |
|-----------------------------------------|----------|------------|---------|
| Readmission within 30 days              | 4 (4.1%) | 10 (10.3%) | 0.165   |
| Reintervention (surgical)               | 3 (3.1%) | 9 (9.3%)   | 0.136   |
| Any complication requiring intervention | 9 (9.3%) | 18 (18.6%) | 0.071   |

Figure 1: Reintervention and readmission



In our study the two intervention groups demonstrated comparable baseline characteristics. The mean age ( $45.29 \pm 10.04$  vs.  $47.14 \pm 11.76$  years;  $p = 0.243$ ) and mean BMI ( $26.07 \pm 3.05$  vs.  $26.32 \pm 3.06$  kg/m<sup>2</sup>;  $p = 0.562$ ) were similar between the DGHAL and transanal suture rectopexy cohorts, respectively. Sex distribution did not differ significantly, with males comprising 57.7% of the DGHAL group and 53.6% of the transanal group ( $p = 0.665$ ). The severity profile was also comparable, as reflected by the distribution of Grade III/IV hemorrhoids (64/33 vs. 60/37;  $p = 0.654$ ). The median duration of symptoms showed no clinically meaningful variation, measuring 18 months (IQR 8-36) in the DGHAL group and 20 months (IQR 9-40) in the transanal group. Operative parameters differed significantly between the two groups. The mean operative time was substantially shorter in the DGHAL group compared with the transanal suture rectopexy group ( $39.4 \pm 7.5$  vs.  $64.9 \pm 14.0$  minutes;  $p < 0.001$ ). Estimated blood loss was also significantly lower in patients undergoing DGHAL ( $50 \pm 20$  mL vs.  $80 \pm 30$  mL;  $p < 0.001$ ). Conversion to open surgery was rare in both groups, occurring in none of the DGHAL cases and in 1 patient (1.0%) in the transanal group ( $p = 0.317$ ). Intraoperative complications were infrequent and comparable, reported in 2 patients (2.1%) undergoing DGHAL and 3 patients (3.1%) in the transanal group ( $p = 0.682$ ). Postoperative outcomes showed significant differences in early recovery parameters between the two groups. Patients in the DGHAL group reported significantly lower pain scores on postoperative day 1 compared with those in the transanal suture rectopexy group (VAS  $3.05 \pm 0.97$  vs.  $4.26 \pm 1.14$ ;  $p < 0.001$ ). Time to first bowel movement was also shorter following DGHAL ( $1.6 \pm 0.8$  vs.  $2.1 \pm 1.0$  days;  $p < 0.001$ ). Rates of postoperative bleeding were comparable between groups (5.2% vs. 9.3%;  $p = 0.405$ ), as were incidences of urinary retention (8.2% vs. 12.4%;  $p = 0.479$ ). Wound or anal infections occurred infrequently, with no significant difference noted (2.1% vs. 3.1%;  $p = 1.000$ ). Long-term outcomes showed no statistically significant differences between the two surgical groups. Clinical recurrence was observed in 6 patients (6.2%) in the DGHAL group compared with 14 patients (14.4%) in the transanal suture rectopexy group ( $p = 0.098$ ). Persistent prolapse occurred in 4 patients (4.1%) following DGHAL and in 8 patients (8.2%) in the transanal group ( $p = 0.205$ ). New-onset fecal incontinence was infrequent and comparable, affecting 3 patients (3.1%) in the DGHAL arm and 5 patients (5.2%) in the transanal arm ( $p = 0.472$ ). Patient-reported satisfaction, categorized as satisfied/neutral/unsatisfied (68/22/7 vs. 60/24/13), also did not differ significantly between groups ( $p = 0.303$ ). Thirty-day postoperative events were comparable between the two groups with no statistically significant differences observed. Readmission within 30 days occurred in 4 patients (4.1%) following DGHAL and in 10 patients (10.3%) in the transanal suture rectopexy group ( $p = 0.165$ ). Surgical reintervention was required in 3 patients (3.1%) in the DGHAL group compared with 9 patients (9.3%) in the transanal group ( $p = 0.136$ ). Similarly, the proportion of patients experiencing any complication necessitating intervention was higher in the transanal group (18.6%) than in the DGHAL group (9.3%), although this difference did not reach statistical significance ( $p = 0.071$ ).

## Discussion

We observed that although both groups demonstrated comparable baseline profiles, several intraoperative and postoperative parameters consistently showed higher values in the transanal suture rectopexy cohort. The operative duration was markedly greater in the transanal group ( $64.9 \pm 14.0$  minutes) compared with the DGHAL group ( $39.4 \pm 7.5$  minutes), indicating a more technically demanding and time-consuming procedure. Similarly, intraoperative blood loss was significantly higher in the transanal arm ( $80 \pm 30$  mL vs.  $50 \pm 20$  mL), reaffirming the relatively greater invasiveness of this approach. Early postoperative recovery also favored DGHAL, as patients undergoing transanal repair experienced higher pain scores on postoperative day one (VAS  $4.26 \pm 1.14$  vs.  $3.05 \pm 0.97$ ) and a longer time to first bowel movement ( $2.1 \pm 1.0$  vs.  $1.6 \pm 0.8$  days). Although these differences were not statistically significant, postoperative bleeding (9.3% vs. 5.2%), urinary retention

(12.4% vs. 8.2%), and postoperative infections (3.1% vs. 2.1%) occurred more frequently in the transanal group. Long-term clinical outcomes similarly showed higher rates in the transanal cohort, including recurrence (14.4% vs. 6.2%), persistent prolapse (8.2% vs. 4.1%), and new-onset fecal incontinence (5.2% vs. 3.1%). Patient satisfaction patterns, although not significantly different, also indicated a slightly higher proportion of dissatisfaction in the transanal group (13 vs. 7). The 30-day postoperative profile followed the same trend, with increased readmissions (10.3% vs. 4.1%), reinterventions (9.3% vs. 3.1%), and complications requiring intervention (18.6% vs. 9.3%). In similar study by Zhai et al. (2016) [7] and Chivate and Ladukar (2012) [8], who demonstrated that suture-based transanal procedures generally require more operative time and involve greater tissue manipulation. Early postoperative recovery in our patients also showed a clear advantage for DGHAL, with lower VAS pain scores and earlier bowel recovery, consistent with the results of Popov et al. (2019) [9] and Jeong et al. (2011) [10], who found that Doppler-guided dearterialization techniques result in lower immediate postoperative discomfort. Although our differences in early complications such as bleeding, urinary retention, and infection did not reach statistical significance, the numerical trend of higher morbidity in the transanal group mirrors observations made by Sherif et al. (2016) [11]. Long-term outcomes in our study also revealed higher recurrence, persistent prolapse, and new-onset fecal incontinence in patients undergoing transanal repair, which is comparable to findings reported by Chivate (2022) [12], Rotta et al. (2012) [13], and Mohamed et al. (2022) [14], who noted variable but often higher recurrence rates with transanal suture repairs depending on technique and follow-up duration. Patient satisfaction and 30-day readmissions similarly trended less favorably in the transanal group, echoing the patterns described by Singh et al. (2023) [15] and Rajput et al. (2024) [16], where the invasiveness and postoperative discomfort associated with transanal procedures influenced patient-reported outcomes and early healthcare utilization.

## Conclusion

We concluded that both dghal and transanal suture rectopexy were successful in reducing symptoms in this prospective randomized comparative trial of 194 patients with bothersome hemorrhoids. Transanal suture rectopexy, on the other hand, was linked to longer operating times, greater intraoperative blood loss, and slower early postoperative recovery, including more pain and delayed bowel movements. Although not all differences were statistically significant, postoperative problems such as bleeding, urine retention, infections, and reinterventions were more common in the transanal group. DGHAL also had better long-term results, with reduced rates of fecal incontinence, recurrence, and chronic prolapse. All things considered, DGHAL showed a safer and more patient-friendly profile, indicating that it might be the recommended minimally invasive treatment for symptomatic hemorrhoids while retaining equivalent efficacy.

## References

1. Loder PB, Kamm MA, Nicholls RJ, Phillips RKS. Haemorrhoids: Pathology, pathophysiology and aetiology. *Br J Surg*. 1994;81(7):946-954.
2. Chivate SD, Ladukar L, Ayyar M, Mahajan V, Kavathe S. Transanal suture rectopexy for haemorrhoids: Chivate's painless cure for piles. *Indian J Surg*. 2012;74(5):412-417.
3. Miligan MG, Morgan CN, Jones LE, Officer R. Surgical anatomy of the anal canal. *Lancet*. 1937;2:1119-1122.
4. Morinaga K, Hasuda K, Ikeda T. A novel therapy for internal hemorrhoids: Hemorrhoidal artery ligation with a Doppler-guided proctoscope. *Am J Gastroenterol*. 1995;90:610-613.
5. Faucheron JL, Poncet G, Voirin D, Badic B, Gangner Y. Doppler-guided hemorrhoidal artery ligation with mucopexy: functional evaluation over 12 months. *Dis Colon Rectum*. 2012;55:127-133.
6. Chivate SD, Killedar MM, Ladukar LD, Vardhani GS, Kavathe SK, Kanekar SR. Transanal suture mucopexy: 13-year multicenter experience (5,634 patients). *Dis Colon Rectum*. 2022;65(5):742-749.
7. Zhai M, Li Y, Zhang X, Chen W. Comparative study of suture-fixation mucopexy versus Doppler-guided hemorrhoidal artery ligation in symptomatic hemorrhoids. *Colorectal Dis*. 2016;18(4):O125-31.
8. Chivate SD, Ladukar MY. Transanal suture rectopexy for haemorrhoids: a novel tissue-fixation technique. *Ind J Surg*. 2012;74(5):396-400.
9. Popov V, Duthie G, Wilson M. Doppler-guided transanal hemorrhoidal dearterialization: outcomes from a prospective cohort study. *Tech Coloproctol*. 2019;23(8):791-7.
10. Jeong WJ, Kim NK, Min BS. One-year outcomes of Doppler-guided hemorrhoidal dearterialization with recto-anal repair. *J Korean Soc Coloproctol*. 2011;27(3):147-52.
11. Sherif TM, El-Nakeeb A, Fikry A. Doppler-guided hemorrhoidal artery ligation with recto-anal repair versus conventional surgery in grade IV hemorrhoids: a randomized trial. *Egypt J Surg*. 2016;35(2):89-96.
12. Chivate SD. Transanal suture mucopexy: long-term results of a simplified technique for hemorrhoids. *Dis Colon Rectum*. 2022;65(3):345-53.
13. Rotta CM, Pinto RA, Saad SS. Doppler-guided hemorrhoidal artery ligation with rectal mucopexy: technique and clinical results. *J Coloproctol (Rio J)*. 2012;32(3):259-65.
14. Mohamed KMS, Osman AM, Hassan R. Doppler-guided hemorrhoidal artery ligation versus conventional procedures: long-term outcomes. *Eur J Surg*. 2022;48(1):52-9.
15. Singh A, Prasad M, Gupta R. Clinical outcomes of transanal suture rectopexy compared with minimally invasive hemorrhoid surgery: a comparative study. *Indian J Colo-Rectal Surg*. 2023;6(2):112-8.
16. Rajput D, Sharma S, Tiwari P. Early morbidity and recurrence after transanal suture rectopexy versus dearterialization techniques: a prospective comparison. *Int Surg J*. 2024;11(1):45-52.