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Original Research Article

Beyond excision: prospective evaluation of a novel mucosal rectopexy technique (Chivate's procedure) for hemorrhoids

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ABSTRACT

Background: Hemorrhoidal disease remains a prevalent anorectal condition with significant impact on quality of life. Although excisional hemorrhoidectomy is considered definitive treatment, postoperative pain and delayed recovery remain major limitations. This has prompted interest in non-excisional, sphincter-preserving alternatives. Chivate's procedure (transanal sutured mucosal rectopexy) is a novel technique designed to achieve symptom control through mucosal fixation and venous decongestion above the dentate line without tissue excision.
Methods: This prospective interventional study was conducted over 29 months at a tertiary care centre and included 110 patients with Grade II–IV hemorrhoids. The procedure involved placement of two circumferential double-interlocked suture lines at 2 cm and 4 cm above the dentate line using 2-0 polyglactin sutures under spinal, saddle, or general anesthesia. Primary outcomes included symptom resolution and recurrence. Secondary outcomes included postoperative pain (VAS at 6 and 24 hours), hospital stay, and perioperative and follow-up complications up to 3 months.
Results: The median age was 48 years with male predominance (84.5%). Grade III hemorrhoids were most frequent (49%). Bleeding per rectum was the predominant presenting symptom (37.3%). Intraoperative complications were absent in 91.8% of patients. Mean VAS decreased from moderate pain at 6 hours to 2.18 on day 1. Mean hospital stay was 2.25 days. At 3 months, 90.9% of patients were symptom-free, with a hemorrhoid resolution rate of 99.1% and recurrence rate of 0.9%. The most common late complication was residual skin tag formation (6.4%).
Conclusions: Chivate's procedure appears to be a safe and effective minimally invasive alternative for Grade II–IV hemorrhoids, demonstrating high symptom resolution, minimal postoperative pain, short hospitalization, and low recurrence in short-term follow-up. Further comparative and long-term studies are warranted.

Keywords: Hemorrhoids, Chivate's procedure, Mucosal rectopexy, Minimally invasive surgery, Hemorrhoidectomy alternatives, Prospective study

INTRODUCTION

Hemorrhoidal disease is one of the most frequent benign anorectal conditions encountered in surgical practice and continues to account for a significant proportion of outpatient and operative workload.[1] Although common, its management particularly in advanced grades remains a subject of ongoing refinement and debate.[2]

The underlying pathology is now understood to be a combination of vascular enlargement of the anal cushions along with progressive weakening of their supporting connective tissue.[2,3] This leads to gradual descent of the

cushions and eventual prolapse. In clinical practice, symptoms are often aggravated by chronic constipation, straining during defecation, and lifestyle-related factors that increase intra-abdominal pressure.[4]

While early disease can usually be managed with dietary modification, pharmacotherapy, and office-based procedures such as rubber band ligation, surgical intervention is frequently required for Grade III and IV hemorrhoids or for cases that fail conservative treatment.[1,5] Conventional excisional hemorrhoidectomy, particularly the Milligan–Morgan procedure, has remained the standard treatment for decades. However, its association with significant postoperative pain and relatively prolonged recovery often affects patient acceptance and early return to normal activity.[6-8]

In recent years, there has been a gradual shift toward procedures that aim to reduce tissue trauma while maintaining effective control of symptoms.[4,9] Techniques such as stapled hemorrhoidopexy and Doppler-guided hemorrhoidal artery ligation represent this evolving trend toward minimally invasive surgery.[10,11]

Chivate's procedure (transanal sutured mucosal rectopexy) is one such newer technique that attempts to address hemorrhoidal disease without excision of tissue, instead relying on mucosal fixation and interruption of vascular channels above the dentate line. Despite its theoretical advantages, published clinical data on its outcomes remain limited, and there is a need for more real-world evidence regarding its efficacy and safety.[12-14] With this background, the present study was undertaken to evaluate the clinical profile and short-term outcomes of patients undergoing Chivate's procedure for Grade II–IV hemorrhoids in a tertiary care setting.

METHODS

Study design and setting

This was a prospective interventional study conducted in a tertiary care center in central India- Indira Gandhi Government Medical College, Nagpur, over a period of 29 months (October 2023 to March 2026). The study evaluated patients with symptomatic hemorrhoids undergoing Chivate's procedure.

Study population

A total of 110 patients diagnosed with Grade II, III, and IV hemorrhoids who were willing for surgical intervention were included in the study. Patients were selected from outpatient and inpatient departments based on clinical evaluation and proctoscopic findings.

Inclusion criteria

Patients aged ≥18 years; Diagnosed cases of Grade II, III, and IV internal hemorrhoids; Patients fit for surgery under anesthesia; and patients providing informed written consent

Exclusion criteria

Patients with Grade I hemorrhoids managed conservatively; Patients with associated anorectal conditions requiring alternative surgery (e.g., fistula, fissure as primary pathology); Patients unfit for anesthesia; and Patients unwilling for follow-up.

Surgical technique

All procedures were performed under spinal, saddle, or general anesthesia in lithotomy position. Using a self-illuminating Chivate proctoscope, two circumferential double-interlocked continuous suture lines were placed at approximately 2 cm and 4 cm above the dentate line using 2-0 polyglactin (Vicryl) sutures. The sutures were tied to achieve mucosal plication and venous channel ligation, aiming to reduce vascular engorgement and support mucosal fixation. Care was taken to avoid injury below the dentate line to minimize postoperative pain.

Outcome measures

Patients were assessed for: intraoperative complications; Postoperative pain using Visual Analog Scale (VAS) at 6 and 24 hours; duration of hospital stay; early and late postoperative complications; and symptom resolution and recurrence during follow-up.

Follow-up protocol

Patients were followed at 1 week, 2 weeks, 1 month and 3 months postoperatively for evaluation of symptoms and complications.

Statistical analysis

Data were compiled in Microsoft Excel and analyzed using appropriate descriptive statistics. Categorical variables were expressed as percentages, and continuous variables as mean or median values as applicable.

Ethical considerations

The study was conducted after obtaining institutional ethical committee approval. Written informed consent was obtained from all participants prior to inclusion.

RESULTS

Patient demographics and clinical profile

A total of 110 patients were included in the study. The median age was 48 years, with a marked male predominance (84.54%). Grade III hemorrhoids constituted the most common presentation (49%), followed by Grade IV (32.7%) and Grade II (18.1%).

Bleeding per rectum was the most frequent presenting symptom (37.27%), particularly in early disease, whereas advanced grades were more commonly associated with irreducible prolapsing mass. A statistically significant association between presenting symptoms and disease grade was observed on chi-square analysis, suggesting progression of symptom severity with advancing disease.

Intraoperative outcomes

The procedure demonstrated a favorable intraoperative safety profile. No intraoperative complications were observed in 91.82% of patients. The remaining cases had minor, self-limiting events that did not require conversion or additional intervention. No, statistically significant difference in intraoperative complication rates was observed across age or gender subgroups ($p > 0.05$, where analyzed).

Postoperative pain

Postoperative pain showed a consistent downward trend. At 6 hours, patients generally reported moderate pain levels (mode VAS score: 4). By 24 hours, the mean VAS score reduced to 2.18, reflecting rapid early postoperative recovery and good pain tolerance of the procedure. Higher-grade hemorrhoids demonstrated slightly higher early postoperative pain scores; however, this difference was not clinically significant on intergroup comparison (ANOVA/Kruskal–Wallis applied).

Hospital stay

The mean duration of hospital stay was 2.25 days. Nearly half of the patients (42.7%) were discharged by postoperative day 2. A trend of increasing hospital stay with advancing grade of disease was observed, and this association was found to be statistically significant on comparative analysis.

Postoperative complications

Immediate postoperative recovery was uneventful in the majority of patients, with 97.27% remaining complication-free. At follow-up, 90% of patients continued to remain free of any complications. Residual skin tag formation was the most common late complication, observed in 6.36% of patients, and was more frequently associated with Grade IV disease (25%). Grade-wise distribution of complications showed a statistically significant association with disease severity on chi-square analysis.

Clinical outcomes

Overall symptom resolution was achieved in 90.91% of patients. The hemorrhoid resolution rate was 99.09%, with only a single recurrence reported (0.91%) during the follow-up period. Complete symptom resolution was achieved in all patients with Grade II disease and in 98.15% of those with Grade III disease, indicating better outcomes in earlier stages.

Table 1: Demographic and clinical profile of patients.

Variables	Results
Total patients	110
Median age	48 years
Gender (Male)	84.54%
Grade II	18.1%
Grade III	49%
Grade IV	32.7%
Most common symptom	Bleeding per rectum (37.27%)

Table 2: Intraoperative outcomes.

Outcomes	Results
No intraoperative complication	91.82%
Minor complications	8.18%
Conversion required	0%

Table 3: Postoperative pain and hospital stay.

Parameters	Results
VAS score at 6 hours	Moderate (mode 4)
VAS score at 24 hours	2.18 (mean)
Mean hospital stay	2.25 days
Discharge by day 2	42.7%

Table 4: Postoperative outcomes and complications.

Outcomes	Results
Symptom-free patients	90.91%
Hemorrhoid resolution	99.09%
Recurrence rate	0.91%
No complications at follow-up	90%
Most common complication	Residual skin tag (6.36%)

DISCUSSION

Hemorrhoidal disease is a common anorectal disorder, and patients presenting to tertiary surgical centres frequently have advanced disease. In the present study, Grade III hemorrhoids were the most common presentation (49.09%), followed by Grade IV (32.73%) and Grade II (18.18%). This distribution is comparable to the original series by Chivate et al in which Grade III hemorrhoids constituted 51.8% of 166 patients undergoing transanal suture rectopexy, although the present study included a higher proportion of Grade IV disease (32.73% vs 16.9%).[12] The predominance of middle-aged patients in the present series, with 77.28% between 31 and 60 years, is also consistent with epidemiological studies demonstrating that hemorrhoidal disease is predominantly encountered in middle-aged

adults.[3,15-17] A marked male predominance was observed in the present study (84.54%), which is comparable to several hospital-based studies reporting male predominance, including those by Flemban et al., Bek et al. and Malviya et al.[18-20] Differences from population-based studies may reflect differences in healthcare-seeking behaviour and the tertiary-care surgical setting.

Bleeding per rectum was the most common presenting symptom in the present study, occurring in 37.27% of patients as an isolated complaint and forming part of the presentation in more than two-thirds of patients when combined with prolapse-related symptoms. This is consistent with previous studies of transanal suture procedures, in which bleeding and prolapse were among the predominant presenting features.[12,21,22] Surakod and Kansal reported bleeding in 82% and prolapse in 56% of patients undergoing Chivate's procedure, supporting the importance of these symptoms in patients presenting for surgical treatment.[21]

The mean operative time in the present study was 65.99±8.00 minutes. This was longer than the operative times reported by Nayak et al (39.33±4.79 minutes) and Madhuri et al (40.11±4.81 minutes) for Chivate-type procedures.[23,24] The longer operative duration in the present series may be related to the larger sample size, greater proportion of Grade IV hemorrhoids and the teaching-hospital setting. Despite the longer operative time, the procedure produced favorable clinical outcomes. Senguttuvan et al similarly reported that Chivate's procedure required more operative time than Milligan-Morgan hemorrhoidectomy, while demonstrating substantially less postoperative pain.[25]

An important finding of the present study was the marked intraoperative reduction of hemorrhoidal prolapse. Following the procedure, 99.09% of patients were reduced to Grade I or II, with no residual Grade IV prolapse. This reflects the fundamental mechanism of Chivate's procedure, which restores the prolapsed mucosal and hemorrhoidal cushions rather than excising them. Chivate et al. reported substantial reduction of hemorrhoidal engorgement following transanal suture mucopexy, with further reduction occurring during the early postoperative period.[12,14] The high rate of immediate anatomical correction observed in the present study therefore supports the effectiveness of the procedure in controlling prolapse.

The intraoperative complication rate was low. Bleeding was the most frequent intraoperative event and was managed conservatively without major operative morbidity. Chivate et al. reported intraoperative bleeding from the suture line in 15 of 166 patients (9.04%), which is comparable to the 7.27% observed in the present study.[12] The large 2022 series of 5634 patients also described minor oozing from mucopexy stitches as a recognized but manageable event.[14] These findings indicate that bleeding related to suture placement is generally minor and does not compromise the safety of the procedure.

Postoperative pain was one of the principal outcomes of the present study. Pain was moderate at 6 hours but decreased substantially by postoperative day, when the mean pain score was only 2.18±0.45 and 83.64% of patients had a score of 2. These findings are consistent with the low-pain profile reported for transanal suture procedures. In the original Chivate series, 162 of 166 patients reportedly experienced no postoperative pain, with only four patients describing dull pain.[12] In their large series of 5634 patients, Chivate et al. reported VAS 1–2 in 97.8% and VAS 2–3 in 2.2% of patients.[14] Islam et al reported a 24-hour VAS of 2.09±0.30 following transanal suture hemorrhoidopexy, which is closely comparable to the present day-1 mean of 2.18±0.45.[26] Senguttuvan et al reported a mean postoperative pain score of approximately 3/10 after Chivate's procedure compared with 7/10 following Milligan-Morgan hemorrhoidectomy, further supporting the pain-sparing advantage of the non-excisional technique.[25] Madhuri et al similarly found substantially fewer patients with clinically significant postoperative pain following Chivate's procedure compared with conventional hemorrhoidectomy.[24]

The mean hospital stay in the present study was 2.25±1.03 days, with a median of 2 days. Although this was longer than the approximately 24-hour stay reported by Chivate et al. in both their original and larger series, it remains consistent with the short-stay nature of the procedure.[12,14] Surakod et al reported that most patients were discharged within 1–2 days, while Madhuri et al reported a mean stay of approximately 1.5 days following Chivate's procedure.[21,24] The slightly longer stay in the present study may reflect institutional discharge practices, postoperative observation protocols and the higher proportion of advanced disease.

The postoperative complication profile was favorable. During follow-up, 90% of patients had no documented complication, while the most frequent minor finding was residual skin tag formation. Recurrence occurred in only one patient (0.91%). These findings are broadly consistent with previous studies. Chivate et al reported effective treatment without complications in 98.65% of their 5634-patient series and a recurrence rate of approximately 1.3% over a mean follow-up of 7±6 years.[14] Surakod et al reported no postoperative complication in 88% of patients, with bleeding, pain and constipation occurring in a small proportion.[21] Singh et al reported favorable postoperative outcomes without significant pain, soiling or leakage in their 58-patient series.[22] Chhabda et al also reported a generally favorable postoperative profile following transanal sutured rectopexy.[27] The comparative study by Madhuri et al. further demonstrated a lower postoperative morbidity profile with Chivate's procedure compared with classical hemorrhoidectomy.[24]

Symptom resolution in the present study was 90.91%, with only 2.73% having persistent or recurrent symptoms. Hemorrhoid resolution was achieved in 109 of 110 patients (99.09%), with only one recurrence. These results demonstrate that the procedure was not only associated with low postoperative morbidity but also provided effective symptomatic and anatomical control. The recurrence rate is particularly comparable with the 1.3% recurrence reported by Chivate et al in their large series of 5634 patients.[14] Islam et al similarly reported only one small recurrent prolapse in the transanal suture group.[26] Singh et al and Surakod et al also reported effective control of hemorrhoidal mass, prolapse and recurrence following Chivate's procedure.[21,22]

CONCLUSION

Overall, the present study demonstrates that Chivate's procedure provides effective treatment of Grade II–IV hemorrhoids with a high rate of anatomical and symptomatic resolution, low recurrence, limited postoperative morbidity and low postoperative pain. The findings are broadly consistent with the existing literature, including the original Chivate series and the subsequent large multicentre experience. The main difference from some previously published series was the slightly longer operative time and hospital stay in the present study, which may be attributable to the tertiary-care teaching environment and patient characteristics. Importantly, the favorable outcomes observed in this 110-patient series support the reproducibility of Chivate's procedure as a non-excisional alternative for the treatment of symptomatic hemorrhoidal disease.

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