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Doppler-guided transanal haemorrhoidal dearterialization (THD) for the treatment of symptomatic haemorrhoids: A cohort study

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Abstract

Background and objectives: Haemorrhoids is a common presenting problem to the surgical outpatient. Although open haemorrhoidectomy is an effective procedure, it can lead to significant postoperative pain, narrowing and incontinence. Among many alternative procedures with fewer complications, Transanal Haemorrhoidal dearterialization (THD) with mucopexyis an efficacious and safe alternative with less pain and complications. We aimed to evaluate the outcomes of THD, in terms of complications and recurrence rates, in the treatment of symptomatic haemorrhoids.

Methods: this prospective cohort study included all consecutive patients with symptomatic haemorrhoids who underwent THD and rectal mucopexy procedures between January 2013 and December 2022. Patients' demographics, operative and postoperative data were recorded prospectively. Patients were seen at regular intervals for 60 months. Long-term complications, recurrence and reoperation were recorded during the visits. Microsoft® Excel 2020 and SPSS
version 26 was used for data entry and analysis.

Results: Eighty-six consecutive patients presented with symptomatic haemorrhoids and underwent THD. The mean age was 41 years, and 80% were men. Rectal bleeding was the most common presenting symptom in 61%, followed by pain and prolapse in 15% and 16%, respectively. Eight per cent of patients presented with strangulated haemorrhoids. Grade III haemorrhoids was the commonest (46.5%). Mean operation time was <30 minutes in 65% of cases. Minor bleeding for 2 days was noticed in 43% of cases after surgery, and minor pain for 3-4 days in 45.3%. Recurrence was noted in 5.8% of cases. The reoperation rate was 2.3%.

Conclusion: Data suggest that THD is safe and effective in treating symptomatic haemorrhoids, with low recurrence and reoperation rates.

Keywords: THD; Mucopexy; Outcomes; Complications; Recurrence.

Introduction

The haemorrhoidal disease is considered the most common anal condition presented to surgical outpatient clinics. Haemorrhoids are the most common cause of bleeding presented to the endoscopy unit.[1,2]

A detailed history, anorectal examination and anoscopy are essential for a proper assessment to identify patients requiring conservative or surgical treatment.

For many years, classical haemorrhoidectomies have been considered the gold standard of surgical treatment of haemorrhoids because they are effective over the long term and have low recurrence rates. On the other hand, they are often accompanied by intense and prolonged postoperative pain, leading to delays in return to normal activities. They may involve complications such as residual fissures, incontinence, and anal stenosis.[3,4] Many other alternative procedures have been introduced to reduce postoperative complications and to

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provide a better outcome.

Morinaga introduced a new non-excisional procedure which involved Doppler-guided ligation of haemorrhoidal arteries without significant complications in 1995.[5] Since then. After a few modifications, THD has been increasingly used to treat symptomatic haemorrhoids.[6-10]

As its name implies, this procedure aims to reduce the arterial blood flow to the haemorrhoids.[11] More recently, rectal mucopexy was added to reduce the prolapsing component of more advanced haemorrhoids.[12] This non-excisional surgical procedure has the advantage of preserving the anatomy and physiology of the anal canal.

THD was first introduced in our unit in Erbil in 2013. The present study aimed to evaluate and assess the results of THD and rectal mucopexy for symptomatic haemorrhoids in terms of postoperative pain, resume of daily activity, reoperation rate, long-term complication and recurrence.

Methods

Data collection

This prospective cohort study included all consecutive patients who presented with symptomatic haemorrhoids to our hospital and underwent the THD procedure in Zheen Private Hospital in Erbil -Iraq, between January 2013 and December 2022. All patients had mucopexy with THD. Patients who had grade 1 and 2 haemorrhoids with persistent symptoms despite medical and dietary treatments and those with symptomatic grades 3 and 4 were planned for the THD procedure. No patient has been excluded from the study during this period. The procedure was fully explained, and informed consent was obtained from all patients.

Data were collected prospectively for all patients during surgery and consequent clinical visits. Collected data included patient demographics, presenting primary and secondary symptoms, grade of haemorrhoids, type of anaesthesia, procedure duration and postoperative outcomes. All patients who presented with bleeding had endoscopic evaluation by either flexible sigmoidoscopy (for younger patients) or colonoscopy before surgery to exclude other causes of bleeding. Patients were given a phosphate enema 30 minutes before the surgery.

Ethical approval was obtained from the Ethics Committee of the College of Medicine—Hawler Medical University (paper code 4, 8 July 2024).

Surgical technique

THD Doppler technique has previously been described in detail in the literature.[13,14] THD procedure was initiated in our unit by a team of two surgeons trained in THD and performed all the procedures. Patients were placed in a lithotomy position under general, spinal or local anaesthesia. THD instruments (THD Slide, THD S.P.A., Correggio, Italy) were used to perform the procedure. The haemorrhoidal arteries were identified at the distal rectum using the incorporated Doppler probe and were ligated with a figure of eight sutures. About 4 to 6 arteries were found and ligated in each patient. A rectal mucopexy was performed in every patient regardless of the degree of the haemorrhoids. Some patients with other pathologies, such as skin tags or fissure in ano, had an extra procedure such as skin tag excision or lateral sphincterotomy.

Patients were allowed home 4 - 6 hours after the surgery when comfortable, had no vomiting and were able to pass urine. Postoperatively, patients were advised to avoid prolonged straining and a high-fibre and fluid-rich diet for 1 month. A stool softener and analgesics (Paracetamol 500 mg and Diclofenac sodium 50 mg tds) were given for 5 days after the operation. Patients were seen 5 and 10 days after the operation in the outpatient clinic. Subsequently, patients were seen 2 – 3 months again. Further follow-ups were scheduled at 6 and 12 months after the surgery. In some patients, the follow-up

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period was extended to 60 months. The severity and duration of early postoperative complications, such as bleeding and pain, were recorded at these visits. Readmission because of complications and reoperation was recorded. Recurrence of the haemorrhoids, defined as the return of symptoms, bleeding, and presence of prolapsed tissue or swelling, was confirmed on clinical examination, checked for, and recorded.

Statistical analysis

The statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 26.0 (SPSS, IBM, Armonk, NY), and Microsoft® Excel 2020 was used for the data entry and analysis. Descriptive statistics are used to present frequencies and percentages. Mean ± standard deviation (SD) and interquartile range (IQR) were calculated for numerical data, and Fisher's exact test was used to find the association between categorical variables. *P* <0.05 is regarded as statistically significant.

Results

Over the 10 years of the study, 86 patients with symptomatic haemorrhoids gave consent to and underwent the TDH procedure. Their age ranged from 15 to 84 years (median 41 years). When divided into five groups, 30% of patients were aged 30-39 and 40-49 years each. Eighty per cent of the patients were male gender. Most patients were American Society of Anaesthesiologists **(**ASA) I (76.8%). Bleeding per rectum was the leading presenting symptom in 61% of cases, followed by prolapsing tissue and pain in 16% and 15%, respectively.

Grade III haemorrhoids were the most common (46.5%). Seven patients (8%) presented as strangulated haemorrhoids. Only 2 patients (2.5%) had grade I disease. Two-thirds of the patients (64%) had only a THD procedure, and 36% had another procedure for other concomitant conditions. Table 1 illustrates patients' data.

Table 2 outlines the operative details. Seventy-five (87.2%) patients had no previous anal surgeries, while 10.5% had previous conventional haemorrhoidectomy. General anaesthesia was given to most patients (93%). Two patients (2.3%) with medical comorbidities underwent the procedure under sedation alone. The mean operative time was 30 minutes (18 – 60 minutes), and 65% of the procedures took 30 minutes or less.

Postoperative complications are shown in Table 3. Postoperative bleeding was reported in 44 patients (51.2%). Bleeding lasted 1 – 2 days after surgery in 37 patients, while seven patients had it for more than 3 days. Bleeding stopped spontaneously in all cases. Postoperative pain lasted 3 – 4 days in 39 patients (45.3%) and 1 – 2 days in 31 (36%). Only 14 patients (16.4%) had pain that lasted 1 week, requiring oral analgesia. Eight patients (9.3%) had a delayed discharge because of the inability to pass urine; 5 of them required urinary catheterisation and were subsequently allowed home.

The median follow-up time was 14.7 months (range 3 – 60). Forty patients (46.5%) were followed up for 6 months only. Five patients (5.8%) were diagnosed with symptomatic recurrence during the follow-up period. Only two required surgery, including an excision of swollen external skin tags.

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Table 1 Patients' demographic data

Variables	No.	(%)
Age (years)		
< 30	16	(18.6)
30-39	26	(30.2)
40-49	26	(30.2)
50-59	8	(9.3)
60+	10	(11.6)
Sex		
Male	68	(79.1)
Female	18	(29.9)
American Society of Anesthesiologists		
I	66	(76.7)
II	13	(15.1)
III	6	(7.00)
IV	1	(1.20)
Main presenting symptom		
Bleeding	52	(61.0)
Pain	13	(15.0)
Prolapse	14	(16.0)
Strangulation	7	(8.00)
Grades of the haemorrhoids		
I	2	(2.50)
II	19	(22.0)
III	40	(46.5)
IV	25	(29.0)
Total	86	(100.0)

Table 2 Intraoperative data

Variables	No.	(%)
Associated conditions (procedure)		
None	55	(64.0)
Anal skin tags (Excision)	15	(17.4)
Fissure in ano (lateral sphincterotomy)	14	(16.3)
Fistula in ano (Fistulectomy	2	(2.30)
Previous Surgery		
None	75	(87.2)
Open haemorrhoidectomy	9	(10.5)
Multiple operations	2	(2.30)
Anesthesia		
General	80	(93.0)
Spinal	4	(4.70)
Sedation	2	(2.30)
Mean operative time (range) minutes		
≤ 30 minutes	56	(65.1)
>30 minutes	30	(34.9)
Total	86	(100.0)

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Table 3 Postoperative data

Variables	No.	(%)
Bleeding		
Mean bleeding days (Range), (IQR)	1 (0-8), (2)	
No bleeding	42	(48.8)
1-2 days bleeding	37	(43.0)
≥3 days bleeding	7	(8.10)
Pain		
Mean pain days (range), (IQR)	3 (0-7), (2)	
No pain	2	(2.30)
1-2 days pain	31	(36.0)
3-4 days pain	39	(45.3)
5-7 days pain	14	(16.3)
Urine retention		
Yes	8	(9.30)
No	78	(90.7)
Median follow-up months (Range), (IQR)	14.7 (3-60), (6)	
Recurrence		
Yes	5	(5.80)
No	81	(94.2)
Reoperation		
Yes	2	(2.30)
No	84	(97.7)
Total	86	(100.0)

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Discussion

In recent years, several studies have advised non-excisional THD procedure to be an effective alternative to the classical surgical excision of haemorrhoidal tissue for symptomatic haemorrhoids (mainly bleeding and prolapse).[15,16] This study analyses the first series of patients treated with this procedure in a single centre by two trained surgeons over 10 years. Although gender is not known to be a risk factor for haemorrhoids, many studies have reported a male predominance (80% in our study).[17,18] This may be attributed to male patients seeking medical care more efficiently for their haemorrhoids.

While grade I haemorrhoids require medical treatment, THD is mainly reserved for grade II and III haemorrhoids. Only two patients (2.5%) in our group had grade I disease with bleeding that didn't respond to medical treatment. Those patients preferred to undergo THD rather than other procedures. There are contradicting reports on the benefits of THD for grade IV disease. Ratto et al.,[18] in a series of 35 grade IV haemorrhoids treated with THD, concluded that the technique could be safely and effectively used for grade IV haemorrhoids provided that patients are carefully selected. In this study, 29% of the patients had grade IV haemorrhoids, and 17.4% required additional procedures, such as excision of the external skin tag, which could not be reduced with mucopexy. Patients with anal skin tags should be informed of this excision as this causes more pain postoperatively than THD alone.

THD has been assessed in the emergency setting in treating acute and persistent haemorrhoidal bleeding.[19] There has been no report on its application and benefits in strangulated haemorrhoids. The use of alternative energy devices (i.e., Harmonic Scalpel® and LigaSure™) has been suggested to minimise risks of longstanding postoperative pain, bleeding and stenosis. Seven patients (8%) with strangulated haemorrhoids in this study underwent THD and mucopexy without surgical excision. This was performed after multiple small incisions on the strangulated tissue to drain clots and blood, leading to shrinkage of the swollen tissue. All these patients had no complication, no recurrence and required no further procedure for their haemorrhoids. This suggests that THD may offer a safer alternative to complete excision in this emergency. Further, more extensive studies are needed to demonstrate the efficacy of THD for strangulated haemorrhoids.

Our mean operating time of 30 minutes is comparable to other studies reporting 20 -45 minutes or 20-30 minutes, depending on the number of arteries ligated.[16] All our patients were discharged 4 -6 hours postoperative. Postoperative pain has been the most frequently reported complication following THD. Only two patients (2.3%) didn't experience pain in this series. The remaining reported pain, mostly mild, is described as fullness and tenesmus lasting up to 4 days. Only 16.4% had significant pain that lasted up to 7 days. In the majority of previous papers, up to 35% had postoperative pain, but less than 10% of patients complained of significant postoperative pain. Giordano et al. reported pain in 71% of patients and severe pain in 16% only in a series of patients following THD done for advanced haemorrhoids.[20] Pain is subjective and difficult to measure.

The reported pain severity depends on the patient's pain threshold and any other procedures performed alongside THD. This study did not test the relation of pain with the haemorrhoid grade, but it deserves further consideration. Our postoperative pain was transient and controlled with simple analgesia. Bleeding was reported in 51.2% for a mean of 1 day after surgery. The bleeding was minor and resolved spontaneously. Postoperative bleeding was reported in up to 13% of patients by Ratto et al.[16] The majority of published papers reported an incident rate below 6%. 8.2% of patients in our series had bleeding for

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more than 3 days, which eventually stopped spontaneously. Although urinary retention is not considered a complication but a reflex due to perineal surgery, a small number of patients (9.3%) had difficulty in passing urine after surgery.

The recurrence rate was 5.8% within 1 year of the follow-up. Recurrence was a swollen skin tag or a remnant external component of the haemorrhoids. Only 2 out of these five recurrences required re-excision. This is relatively low and comparable to other series. Giordano et al,[16] in their 1000 patient series reported a 3-20% overall recurrence and reoperation rate of 4.1%-17.8% due to recurrence of symptoms.

The study's main limitations are the small number of cases over a 10-year period. This is because it was carried out in a single institution and, to a certain extent, because of the higher cost of the THD procedure compared to conventional surgical procedures.

Conclusion

THD with lower rectal mucopexy appears to be a safe and effective procedure for the treatment of symptomatic all grades haemorrhoids. It is shown to have low postoperative pain, complications and recurrence rates.

Competing interests

The author declares that he has no competing interests.

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