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General Surgery

INNOVATIVE APPROACHES TO HEMORRHOID TREATMENT: A PROSPECTIVE STUDY OF CHIVATE'S PROCEDURE VS. TRADITIONAL HEMORRHOIDECTOMY

KEY WORDS: Chivate's mucopexy,hemorrhoidectomy

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ABSTRACT

Introduction: Hemorrhoids afflict a significant portion of the population, with a prevalence rate ranging from 4.4% to 3.6%.(The gold standard surgical approach for its treatment know as hemorrhoidectomy,In this study, we aim to compare Chivate's transanal suture rectopexy procedure with the gold standard open hemorrhoidectomy, considering their efficacy, safety profiles, surgical techniques, recovery periods, long-term outcomes, and patient satisfaction, to provide clinicians with valuable insights for decision-making in managing hemorrhoidal disease. **Methodology:** This is a prospective case – control study conducted at a single tertiary care centre. A total of 200 patients were included in the study between a period of January 2023 to December 2023 with the diagnosis of symptomatic grade 3 or grade 4 hemorrhoids. **Results:** A total of 200 patients were included in the study. Patient were allotted randomly into two groups. 100 patients underwent open hemorrhoidectomy and 100 patients underwent chivate's hemorrhoidectomy. In both the groups male predominance was noted. Majority of the patient presented between the age group of 35 – 44 years of age. **Conclusion:** Chivate's transanal suture mucopexy procedure emerges as a promising alternative to the conventional Milligan and Morgan hemorrhoidectomy, further research is warranted to validate the long-term efficacy and safety of Chivate's transanal suture mucopexy procedure, potentially revolutionizing the treatment paradigm for hemorrhoidal disease.

INTRODUCTION

Hemorrhoids afflict a significant portion of the population, with a prevalence rate ranging from 4.4% to 3.6%.[1] The gold standard surgical approach for its treatment know as hemorrhoidectomy, was first described by Milligan and Morgan in 1937.[2]

The primary blood supply to the hemorrhoidal cushion originates from the terminal branches of the superior and middle rectal arteries, constituting the major vascular contribution.[3,4] These cushions, positioned at the 3, 7, and 11 o'clock positions in lithotomy, are vital anatomical structures located within the submucosal layer, extending from the upper border of the anatomical anal canal to the dentate line.[5,6] In symptomatic patient it is observed that the haemorrhoids exhibit significant increase in blood flow and velocity compared to their healthy counterparts.[7] The porto – systemic, arteriovenous anastomosis and sinusoids form a complete cylindrical sheet called the corpora – cavernorsa recti.[8,9]

Treitz's muscle plays a pivotal role in maintaining the physiological position of hemorrhoidal cushions. Comprised of two parts: the anal submucosal muscle – fix the cushions to the floor of the internal sphincter and the mucosal suspensory ligament (Park's ligament), which penetrates the internal sphincter to fix the cushions to the conjoined longitudinal muscle.[4] Prolonged and repeated straining during defecation causes a shearing force that can lead to the fragmentation of Treitz's muscle, potentially resulting in the prolapse of hemorrhoids. The theory of sliding of the anal canal lining causes prolapse of hemorrhoids. Factors contributing to this condition include excessive straining, increased intra-abdominal pressure due to constipation, hard stools, lifting heavy objects, obesity, and severe coughing, particularly evident in grade II to IV hemorrhoids.[4,6,7]

Pathologicalphysiological alterations associated with hemorrhoids include venous dilation, thrombosis, collagen and fibroelastic tissue degeneration, and the distortion and rupture of the anal subepithelial muscle.[10] On straining during defecation, the anal sphincters relax and simultaneously portal veins that are without valves are engorged. Strong rectal contractions during defecation can trap and block the portal veins exiting the seromuscular wall of the rectum. The arterial blood inflow continues, causing continuous engorgement of the hemorrhoidal plexus.[11,12] Histopathological examination of the hemorrhoidal specimens reveals ulcerated mucosa, severe inflammatory reaction involving the vascular wall and surrounding connective tissue, ischemic necrosis and edema.[10,13] Blockage of artery at one site, with dilatation of proximal and shrinkage of distal branches, and multiple side branches join to form collaterals, resulting in positive and negative pressure in these vessels. Despite hemorrhoidectomy, hypervascularity may persist due to collateral vessel formation, contributing to recurrent hemorrhoids.[14,15]

Addressing the core factors essential for successful hemorrhoid treatment, including engorgement, prolapse, recurrence, and pain, remains challenging. All the existing procedures have a recurrence rate between 18% and 60% and it is difficult to assure the patient that haemorrhoids are curable. The development of recurrent hemorrhoids is primarily attributed to the formation of extensive collaterals post-hemorrhoidectomy, where vessel ligation occurs at a single site.[16,17]

In this study, we aim to compare Chivate's transanal suture rectopexy procedure with the gold standard open hemorrhoidectomy, considering their efficacy, safety profiles, surgical techniques, recovery periods, long-term outcomes, and patient satisfaction, to provide clinicians with valuable insights for decision-making in managing hemorrhoidal disease.

MATERIALS AND METHODS

This is a prospective case – control study conducted at a single tertiary care centre. A total of 200 patients were included in the study between a period of January 2023 to December 2023 with the diagnosis of symptomatic grade 3 or grade 4 hemorrhoids. Patients were divided by random

sampling technique into two groups. Group 1 underwent open hemorrhoidectomy and Group 2 underwent chivate's transanal suture rectopexy after taking a written informed consent. Patients have been explained about the safety, possible complication and results of both the techniques.

Patients with thrombosed hemorrhoids, associated inflammatory bowel disease or granulomatous bowel disease, stricture of anal canal and malignancy of anorectum were excluded from the study.

Surgical Technique

All patients were given clear liquids and 3 doses of lactulose (60ml) at 4 hourly intervals on the previous day of the procedure. Prior to induction one gram of cefoperazone was administered intravenously. Under spinal anaesthesia, the patient was placed in lithotomy position. The engorged hemorrhoids were compressed, massaged and reduced in size. The hemorrhoids were then pushed in by the proctoscope and repositioned at the original position above the dentate line. Proctoscope with an aperture and fiberoptic cable connected to a light source to make it self – illuminating is used. The repositioned rectal mucosa is fixed to muscles of the rectal wall 2 cm proximal to the dentate line using 2-0 polyglycolic acid suture material. The initial tied suture of length 0.5 to 1 cm is then pulled tight so that there is a tent of the fixed mucosa and muscle. Overlapping the first suture by several mm another suture is placed of the same length. The needle is bought out, the suture is locked twice through the loop, the thread pulled and the knot is tightened. Similar sutures are placed along the entire circumference of the rectum at the same level and by double – locking after each suturing. Such circumferential sutures are placed in two rows at 2 and 4 cm proximal to the dentate line. Care should be taken such that sutures go through part of the sphincter muscle and not beyond it. We should observe that there is no skip area between any two sutures, as they may cause a purse – string or plication effect and may lead to obstruction.

Patients were followed up by telecommunication for 12 months by assessing any clinical features suggestive of any recurrence, incontinence, pain and satisfaction.

Study Parameters:

The data was collected pertaining the demography of the participants, clinical presentation, diagnosis, type of surgery performed, duration of surgery, post operative visual analogue pain scale, duration of hospital stay, post operative early and late complications.

Statistical Analysis:

Data was collected in an excel sheet. Descriptive and summary measure will be used to describe the data. One – way repeated measures, ANOVA test will be used to test the difference in the follow – up. All this test will be performed using SPSS software. P – value of <0.05 will be considered significant.

RESULTS:

A total of 200 patients were included in the study. Patient were allotted randomly into two groups. 100 patients underwent open hemorrhoidectomy and 100 patients underwent chivate's hemorrhoidectomy. In both the groups male predominance was noted. Majority of the patient presented between the age group of 35 – 44 years of age.

Table 1: Demographic Data

Variables		Chivate's		OH		Total		P value*
		n	%	n	%	n	%	
Age	25-34 years	18	18	19	19	37	18.5	0.583
	35-44 years	46	46	39	39	85	42.5	
	45-60 years	36	36	42	42	78	39	
Gender	Males	79	79	81	81	160	80	0.724
	Females	21	21	19	19	40	20	
Grade	3	49	49	41	41	90	45	0.320
	4	51	51	59	59	119	55	

*Chi square test, OH – open hemorrhoidectomy

The average duration of surgery was more in the chivate's procedure group compared to the open hemorrhoidectomy group with statistically significant difference (p- value - <0.001). The average duration of hospital stay post procedure was significantly lower in chivate's procedure group (p- value - <0.001).

Table 2: Comparison of Duration of surgery and Hospital Stay

Variable	Chivate's		OH		P value*
	Mean	Std. Deviation	Mean	Std. Deviation	
Duration of surgery	35.55	3.214	30.03	3.316	<0.001
Hospital stay in days	1.12	.327	3.67	.842	<0.001

*Independent T test

Majority of the patient who underwent chivates had no pain post procedure when compared to open hemorrhoidectomy had mild to moderate pain post procedure, with statistically significant p - value <0.001.

Table 3: Comparison of Post procedure pain scale between two groups

Variables		Chivates		Open		Total		P value*
		n	%	n	%	n	%	
Pain scale	No pain	83	83	35	35	118	59	<0.001
	Mild pain	17	17	49	49	66	33	
	Moderate pain	0		16	16	16	8	

*Chi square test

It was noted that post chivate's procedure there was lesser complication when compared to open hemorrhoidectomy procedure.

Table 4: Comparison of early complication between two groups

Variables		Chivates		Open		Total		P value*
		n	%	n	%	n	%	
Bleeding PR	Yes	47	47	46	46	93	46.5	1
	No	53	53	54	54	107	53.4	
Urinary retention	Yes	14	14	34	34	48	24	0.001
	No	86	86	66	66	152	76	

*Chi square test

It was noted that post chivate's procedure more recurrence was noted when compared to open hemorrhoidectomy.

Table 5: Comparisons of Late complications between two groups

Variables		Chivates		Open		Total		P value*
		n	%	n	%	n	%	
Recurrence	Yes	25	25	14	14	39	19.5	0.073
	No	75	75	86	86	161	80.5	
Pelvic pain	Yes	3	3	11	11	14	7	0.049
	No	97	97	89	89	186	93	
Bleeding	Yes	2	2	6	6	8	4	0.279
	No	98	98	94	94	192	96	
Incontinence	Yes	1	1	5	5	6	3	0.212
	No	99	99	95	95	194	97	

*Chi square test

DISCUSSION

Hemorrhoids are common anorectal condition encountered in surgical outpatient department. While commonly associated population are in the age group of 50 years. In our study age distribution analysis of the data reveals that most common age group affected with hemorrhoids was middle age group (35 – 44 years). It is consistent to the study conducted by Ravindranath GG et al and Ali SA et al where most common age group was below 40 years.[18,19] Gender wise distribution of hemorrhoids in our study reveals male predominance with 80% of the population being male and 20% being female. This may be due to majority of men seeking treatment for their hemorrhoids and embarrassment felt by women to consult for anorectal problems. A male predominance was also noted in studies conducted by Ravindranath GG et al and Ali SA et al.[18,19]

Many surgical procedures have been proposed over years but none of them have a satisfactory outcome. In Chivate's procedure (transanal suture mucopexy) the core factors responsible for the occurrence of hemorrhoids is managed by simple, repeatable suturing and it avoids excision of engorged hemorrhoids, rectal mucosa or anoderm. In this procedure the sutures are placed 2 and 4cm proximal to the dentate line. Hence the postoperative period is pain free when compared to the gold standard Milligan and Morgan procedure were excision of haemorrhoid and ligation of its pedical is done, which is painful and requires hospitalisation and medication for pain. Chivate's demonstrated transanal suture mucopexy procedure, the located arteries are ligated by figure of eight sutures, 4cm above the dentate line, which is a pain free area.[16,17] In our study it was noted that 83% patient who had undergone chivates procedure had no pain and 65% of the patients who had undergone open hemorrhoidectomy had mild to moderate pain.

In the Milligan – Morgan hemorrhoidectomy procedure, mucosal bridges between 2 excised hemorrhoids are preserved to prevent stricture formation. The recurrence is noted in this procedure due to the unattended secondary piles. The basic principle behind recurrence is the formation of collaterals and hypervascularity. If a long segment of an artery is occluded at 2 sites, then the proximal and distal branches are not available for collateral formation.[14,20,21] In transanal suture mucopexy or Chivate's procedure the vascular elements nourishing the hemorrhoids are blocked at two levels, at 2cm and 4 cm proximal to the dentate line.[17] Hypothetically it is believed that there is less chance of revascularisation and recurrence of the hemorrhoids. In 25% of cases who underwent chivates procedure and 14% of cases who underwent open hemorrhoidectomy showed symptomatic recurrence during the follow up period of 1 year. This increased recurrence noted in chivates procedure maybe due to revascularisation of the hemorrhoids or collateral formation.

The patient who has undergone transanal suture mucopexy can resume their usual activities in 48 to 72 hours, whereas following an open hemorrhoidectomy usual activities can be resumed after 1 to 6 weeks. In this study the mean post operative stay was less than 1 day following chivate's procedure and 3 to 4 days following open hemorrhoidectomy. It was noted that prolonged stay following open hemorrhoidectomy was due to the increased demand of analgesics, persistent of bleeding per rectum and urinary retention. Immediate post operative complications such as pain, and urinary retention was significantly lower in chivate's procedure hence patients could be discharged earlier.

CONCLUSION:

Chivate's procedure effectively addresses the core factors contributing to hemorrhoid occurrence through simple, repeatable suturing techniques, offering a pain-free postoperative period compared to traditional methods. Furthermore, patients undergoing transanal suture mucopexy experience shorter postoperative recovery times and hospital stays, with fewer immediate complications compared to open hemorrhoidectomy. These findings suggest that Chivate's procedure holds promise for improving patient outcomes and reducing healthcare resource utilization in the management of hemorrhoids.

However, Chivate's transanal suture mucopexy procedure emerges as a promising alternative to the conventional Milligan and Morgan hemorrhoidectomy, further research is warranted to validate the long-term efficacy and safety of Chivate's transanal suture mucopexy procedure, potentially revolutionizing the treatment paradigm for hemorrhoidal disease.

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