

A DISSERTATION ON  
“ROLE OF LATERAL ANAL SPHINCTEROTOMY VERSUS  
MAXIMAL ANAL DILATATION IN REDUCING POST  
OPERATIVE PAIN AFTER OPEN  
HEMORRHOIDECTOMY– A COMPARATIVE STUDY”

SUBMITTED TO  
THE TAMILNADU DR.MGR MEDICAL UNIVERSITY

In partial fulfilment of the regulations for the award of the

**Degree of M.S (GENERAL SURGERY)**  
BRANCH-1

Submitted by

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DEPARTMENT OF GENERAL SURGERY  
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MAY 2020

## **CERTIFICATE BY THE INSTITUTION**

This is to certify that dissertation “ROLE OF LATERAL ANAL SPHINCTEROTOMY VERSUS MAXIMAL ANAL DILATATION IN REDUCING POST OPERATIVE PAIN AFTER OPEN HEMORRHOIDECTOMY– A COMPARATIVE STUDY” is a bonafide record of work done by **Dr. J. PRASANTH NARAYANAN** in the Department of General Surgery, Stanley Medical College, Chennai, during his Post Graduate Course from MAY 2017- MAY 2020. This is submitted in partial fulfilment for the award of **M.S. DEGREE EXAMINATION- BRANCH I (GENERAL SURGERY)** to be held in May 2020 under the **Tamilnadu DR.M.G.R. Medical University, Chennai.**

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# DECLARATION

I, **Dr. J. PRASANTH NARAYANAN** solemnly declare that this dissertation titled “**ROLE OF LATERAL ANAL SPHINCTEROTOMY VERSUS MAXIMAL ANAL DILATATION IN REDUCING POST OPERATIVE PAIN AFTER OPEN HEMORRHOIDECTOMY– A COMPARATIVE STUDY**”, is a bonafide work done by me in the department of general surgery, Govt. Stanley Medical College and Hospital, Chennai under the supervision of **Prof. Dr. T. SIVAKUMAR M.S.** This dissertation is submitted to the Tamilnadu Dr MGR Medical university, Chennai in partial fulfilment of the university regulations for the award of M.S. degree (General Surgery ), branch – 1 examination to be held in May 2020.

**DATE:**

**PLACE:**

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I consider it a privilege to have done this study under the supervision of my beloved professor and head of the department **Prof. Dr. T. SIVAKUMARM.S.**, who has been a source of constant inspiration and encouragement to accomplish this work.

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## **CERTIFICATE BY GUIDE**

This is to certify that this dissertation work titled “**ROLE OF LATERAL ANAL SPHINCTEROTOMY VERSUS MAXIMAL ANAL DILATATION IN REDUCING POST OPERATIVE PAIN AFTER OPEN HEMORRHOIDECTOMY– A COMPARATIVE STUDY**” of the candidate **Dr J. PRASANTH NARAYANAN** with registration number **221711062** for the award of **M.S General Surgery degree**. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows 13% of plagiarism in the dissertation.

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# **INTRODUCTION**



Haemorrhoids are one of the most frequent anorectal disorders to affect humans. They are the most common cause of bleeding per rectum and cause considerable pain and suffering. The word haemorrhoid is derived from ancient Greek (haema = blood and rhoos = flowing). The past decade has provided new treatment for haemorrhoids such as the stapled haemorrhoidopexy (stapled anopexy), ligation and the transanal haemorrhoidal de-arterialisation are gaining popularity, but the scientific evidence is still not acceptable.

There are several hypotheses on the aetiology and there are several theories about the pathogenesis of haemorrhoids. The treatment result is often worse than usually stated in the literature with many patients complaining of persistent symptoms and disturbed continence after surgery. Surgery is considered to be the best therapeutic modality for grade 3 and 4 haemorrhoids. Treatment options for haemorrhoids include – less invasive techniques like rubber Band ligation (RBL) and the more radical excisional haemorrhoidectomy (EH) which are more painful. Over the years, different surgical techniques have been described to reduce post-operative pain.

Haemorrhoids is one the most frequent ano-rectal morbidities. It is described as the characteristic enlargement and distal movement of the cushions present in the normal anal canal. Haemorrhoids affect millions worldwide and it represents one of the most important socioeconomic problems. Numerous features have been appealed to be the aetiologies of haemorrhoidal progress and enlargement, which includes constipation and sustained straining while defecation. The irregular dilatation and distortion of the vascular network, both

with damaging alterations in the supportive connective tissues inside the anal cushion, is a principal discovery of haemorrhoidal illness.

The procedure known as excision and ligation, also called open haemorrhoidectomy, was originated by Frederick Salmon, the founder of St. Mark's Hospital, London, in the 1830s. Milligan et al. popularized and modified the technique, which originated in the United Kingdom and followed throughout the world. This traditional approach is effective; however, it often is accompanied by a high incidence of complications, such as incontinence, urinary retention, haemorrhage, and significant pain.

Lateral Anal Sphincterotomy (LAS) after a Milligan Morgan Haemorrhoidectomy significantly reduces pain in the first post-operative period. High anal pressures are common in patients with haemorrhoids suggesting that they may have a pathogenic role. Internal Sphincterotomy avoids pain, urinary retention and stenosis and is safe. Maximal Anal Dilatation (MAD) was a technique described by Lord in 1968, which was based on careful but firm dilatation of the anal canal in order to reduce the anal canal pressure for management of Fissure in ano. This study was conducted to compare the post-operative pain in two groups of patients treated with Lateral Anal Sphincterotomy and Maximal Anal Dilatation following a Milligan Morgan Haemorrhoidectomy.

# **AIM AND OBJECTIVES**

To assess and compare the outcomes of the postoperative pain in Lateral anal sphincterotomy against Maximal Anal Dilatation following a Milligan-Morgan Haemorrhoidectomy in terms of Postoperative pain.

# **REVIEW OF LITERATURE**

Review of literature of this study is described under the following headings:

- i. Anal canal anatomy
- ii. Haemorrhoids
  - a. Pathophysiology
  - b. Risk factors
  - c. Classification and grading
  - d. Management
- iii. Haemorrhoidectomy
- iv. Post-operative pain in various procedures of Haemorrhoidectomy.
- v. Wong Baker's Faces scale for pain

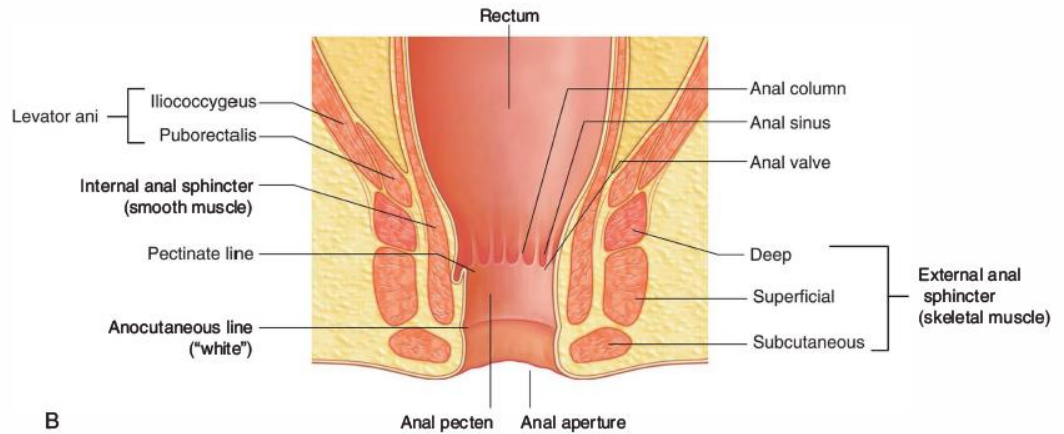
### **i. Anal canal anatomy**

The anal canal begins at the terminal end of the rectal ampulla where it narrows at the pelvic floor. It terminates as the anus after passing through the perineum. As it passes through the pelvic floor, the anal canal is surrounded along its entire length by the internal and external anal sphincters, which normally keep it closed.

The lining of the anal canal bears a number of characteristic structural features that reflect the approximate position of the anococcygeal membrane in the fetus (which closes the terminal end of the developing gastrointestinal system in the fetus) and the transition from gastrointestinal mucosa to skin in the adult.

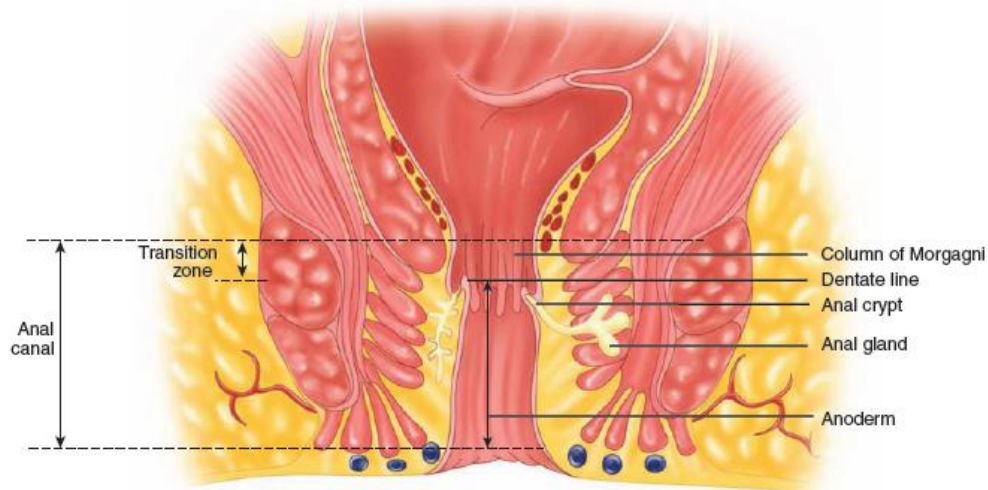
- The upper part of the anal canal is lined by mucosa similar to that lining the rectum and is distinguished by a number of longitudinally oriented folds known as anal columns, which are united inferiorly by crescentic folds termed anal valves. Superior to each valve is a depression termed an anal sinus. The anal valves together form a circle around the anal canal at a location known as the pectinate line, which marks the approximate position of the anal membrane in the fetus.
- Inferior to the pectinate line is a transition zone known as the anal pecten, which is lined by nonkeratinized stratified squamous epithelium. The

anal pecten ends inferiorly at the anocutaneous line ( " white line " ),  
 or where the lining of the anal canal becomes true skin.



The anatomic anal canal extends from the dentate or pectinate line to the anal verge. The dentate or pectinate line marks the transition point between columnar rectal mucosa and squamous anoderm. The anal transition zone includes mucosa proximal to the dentate line that shares histologic characteristics of columnar, cuboidal, and squamous epithelium. Although the anal transition zone was long thought to extend only 1 to 2 cm proximal to the dentate line, it is known that the proximal extent of this zone is highly variable and can be as far as 15 cm proximal to the dentate line. The dentate line is surrounded by longitudinal mucosal folds, known as the columns of Morgagni, into which the anal crypts empty. These crypts are the source of cryptoglandular abscesses. In contrast to the anatomic anal canal, the surgical anal canal begins at the anorectal junction and terminates at the anal verge. The surgical anal canal measures 2 to 4 cm in length and is generally longer in men than in women. It begins at the anorectal junction and terminates at the anal verge.



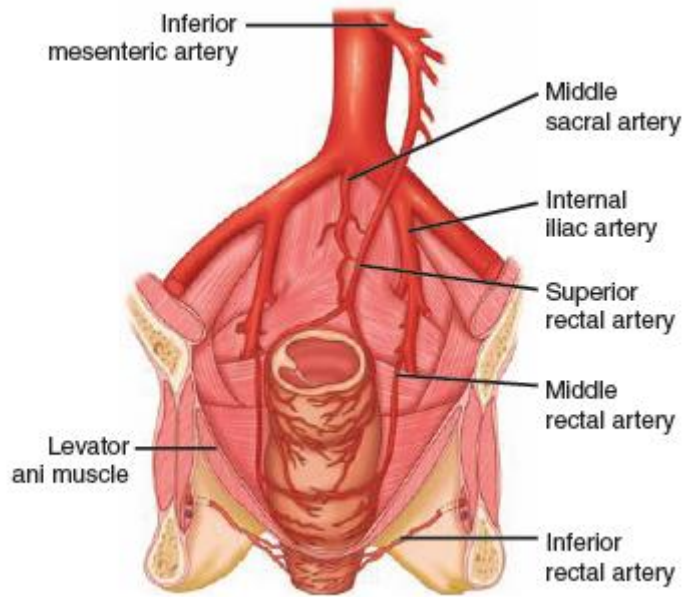


**29-3.** The lining of the anal canal. (From Goldberg SM, Gordon PH, Nivatvongs S, eds. *Essentials of Anorectal Surgery*. Philadelphia:

### **Anorectal Vascular Supply.**

The superior rectal artery arises from the terminal branch of the inferior mesenteric artery and supplies the upper rectum. The middle rectal artery arises from the internal iliac; the presence and size of these arteries are highly variable. The inferior rectal artery arises from the internal pudendal artery, which is a branch of the internal iliac artery. A rich network of collaterals connects the terminal arterioles of each of these arteries, thus making the rectum relatively resistant to ischemia.

The venous drainage of the rectum parallels the arterial supply. The superior rectal vein drains into the portal system via the inferior mesenteric vein. The middle rectal vein drains into the internal iliac vein. The inferior rectal vein drains into the internal pudendal vein, and subsequently into the internal iliac vein. A submucosal plexus deep to the columns of Morgagni forms the hemorrhoidal plexus and drains into all three veins.



### **Anorectal Lymphatic Drainage.**

The anal canal has a more complex pattern of lymphatic drainage. Proximal to the dentate line, lymph drains into both the inferior mesenteric lymph nodes and the internal iliac lymph nodes. Distal to the dentate line, lymph primarily drains into the inguinal lymph nodes, but can also drain into the inferior mesenteric lymph nodes and internal iliac lymph nodes.

### **Anorectal Nerve Supply.**

Both sympathetic and parasympathetic nerves innervate the anorectum. Sympathetic nerve fibers are derived from L1-L3 and join the preaortic plexus. The preaortic nerve fibers then extend below the aorta to form the hypogastric plexus, which subsequently joins the parasympathetic fibers to form the pelvic plexus. Parasympathetic nerve fibers are known as the nervus erigens and originate from S2-S4. These fibers join the sympathetic fibers to form the pelvic plexus. Sympathetic and parasympathetic fibers then supply the

anorectum and adjacent urogenital organs. The internal anal sphincter is innervated by sympathetic and parasympathetic nerve fibers; both types of fibers inhibit sphincter contraction. The external anal sphincter and puborectalis muscles are innervated by the inferior rectal branch of the internal pudendal nerve. The levator ani receives innervations from both the internal pudendal nerve and direct branches of S3 to S5. Sensory innervation to the anal canal is provided by the inferior rectal branch of the pudendal nerve. While the rectum is relatively insensate, the anal canal below the dentate line is insensate.

## **ii. Haemorrhoids**

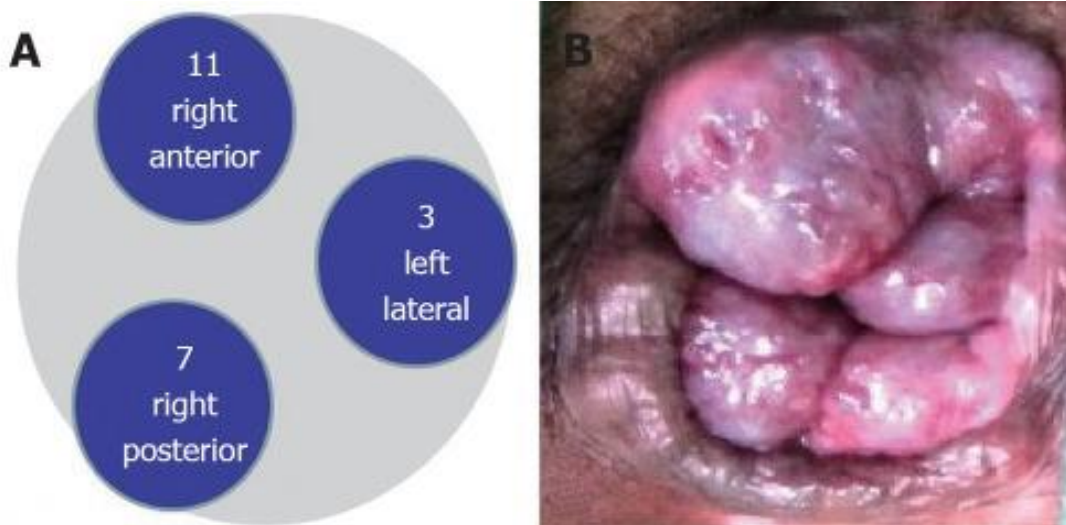
### **a) Pathophysiology:**

The exact pathophysiology behind the development of haemorrhoids is still unclear. For many years, the concept of varicose veins, which hypothesized that the haemorrhoids were produced by varicose veins present in the anal canal. Once it was a popular theory behind haemorrhoids, but later was proven wrong. The model of descending anal canal lining is extensively recognized nowadays. Numerous enzymes or mediators concerning the deprivation of supporting tissues in the anal cushions have been considered. Out of all these enzymes, matrix metalloproteinase (MMP) which is a zinc-dependent proteinase acts by degrading the extracellular proteins like elastin, fibronectin, and collagen.

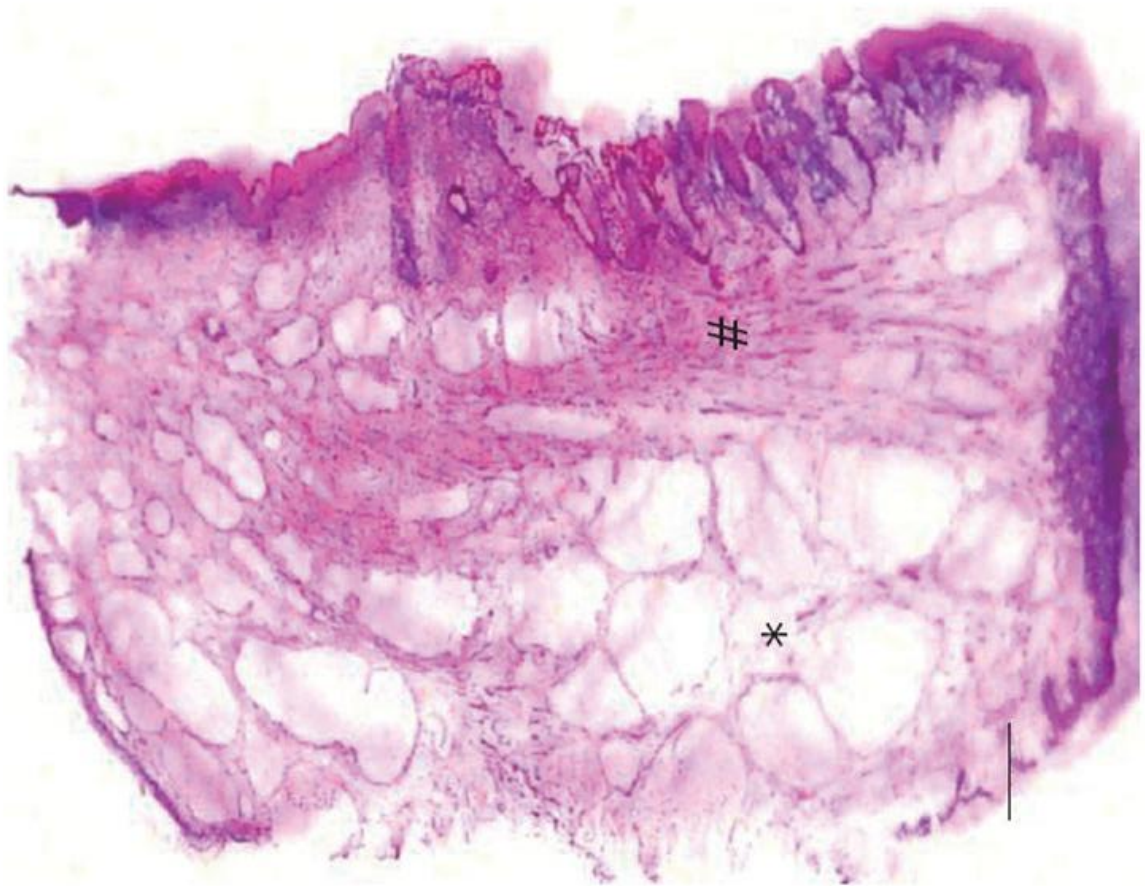
The following image represents the common locations of major anal canal internal haemorrhoids.

A: Image of common locations of major anal cushions;

B: Common locations of internal haemorrhoids.(5)



The important pathological alterations comprise of irregular venous dilatation, thrombosis of the venous system, degenerative progression in the collagen fibres and fibro elastic tissues, alteration and tear of the anal muscularis mucosa. The following image represents the pathological findings in haemorrhoids. i.e., Noticeable dilatation of haemorrhoidal venous plexus - \*; Split anal sub epithelial muscle - # (the Treitz's muscle or mucosa of suspensory ligament) (Scale bar = 1 mm). (6)



**b) Risk factors:**

Constipation and lengthy straining while defecation are assumed to be the reason for haemorrhoids. This is because of the rigid stool and augmented intra-abdominal pressure which will be the source for resistance of venous re-appearence, subsequently leading to the external bulge of the haemorrhoidal plexus. Pregnancy can predispose to cramping of the cushion of the anal canal and thus causing characteristic haemorrhoids. There will be post partum resolution of the same. Numerous nutritional influences comprising less fibre diet,

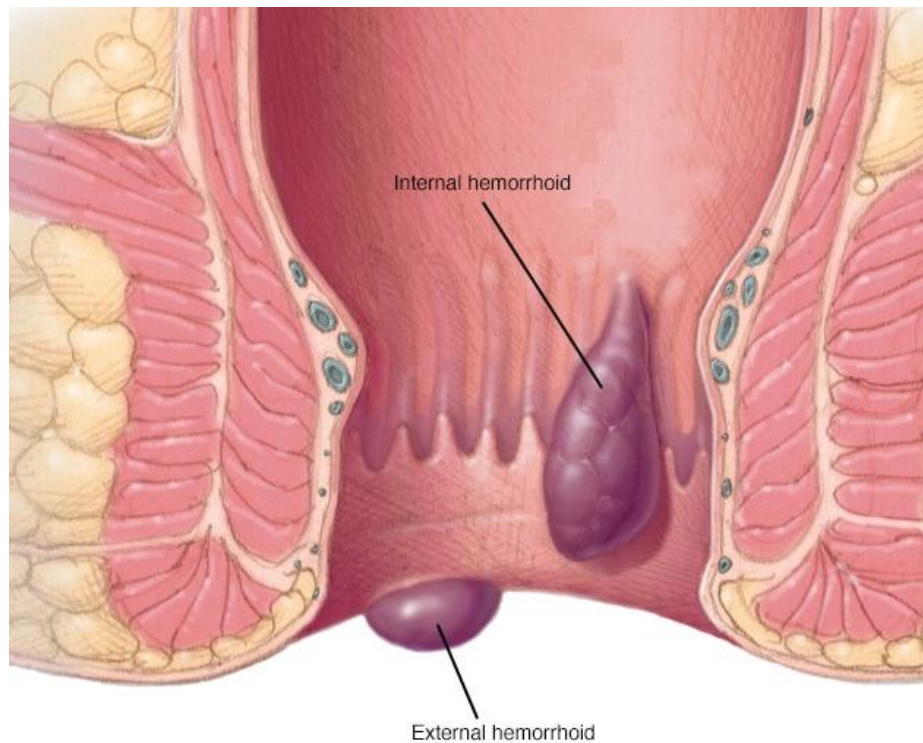
spicy food and increased intake of alcohol have been associated, but the described data are unpredictable. (1)

**c) Classification and Grading:**

Haemorrhoids are commonly categorized based on their site and grade of prolapse.

- i. Internal haemorrhoids, usually originates from the inferior haemorrhoidal venous plexus exceeding the dentate line and are enclosed by mucosa.
- ii. External haemorrhoids are from dilated venules of this plexus located below the dentate line and are covered with squamous epithelium.
- iii. Mixed (interno-external) haemorrhoids ascend together with the exceeding and underneath the dentate line. (7)

The following image represents the line of demarcation between internal and external haemorrhoids: (8)



A haemorrhoid grouping system is beneficial not merely to aid in selecting among managements, but to permit the choosing an appropriate treatment modality for the same. For applied purposes, internal haemorrhoids are additionally classified grounded on their appearance and grade of prolapse, which is commonly known as Goligher's classification:

(1) First-degree haemorrhoids (or grade I): The anal cushions bleed but do not prolapse;

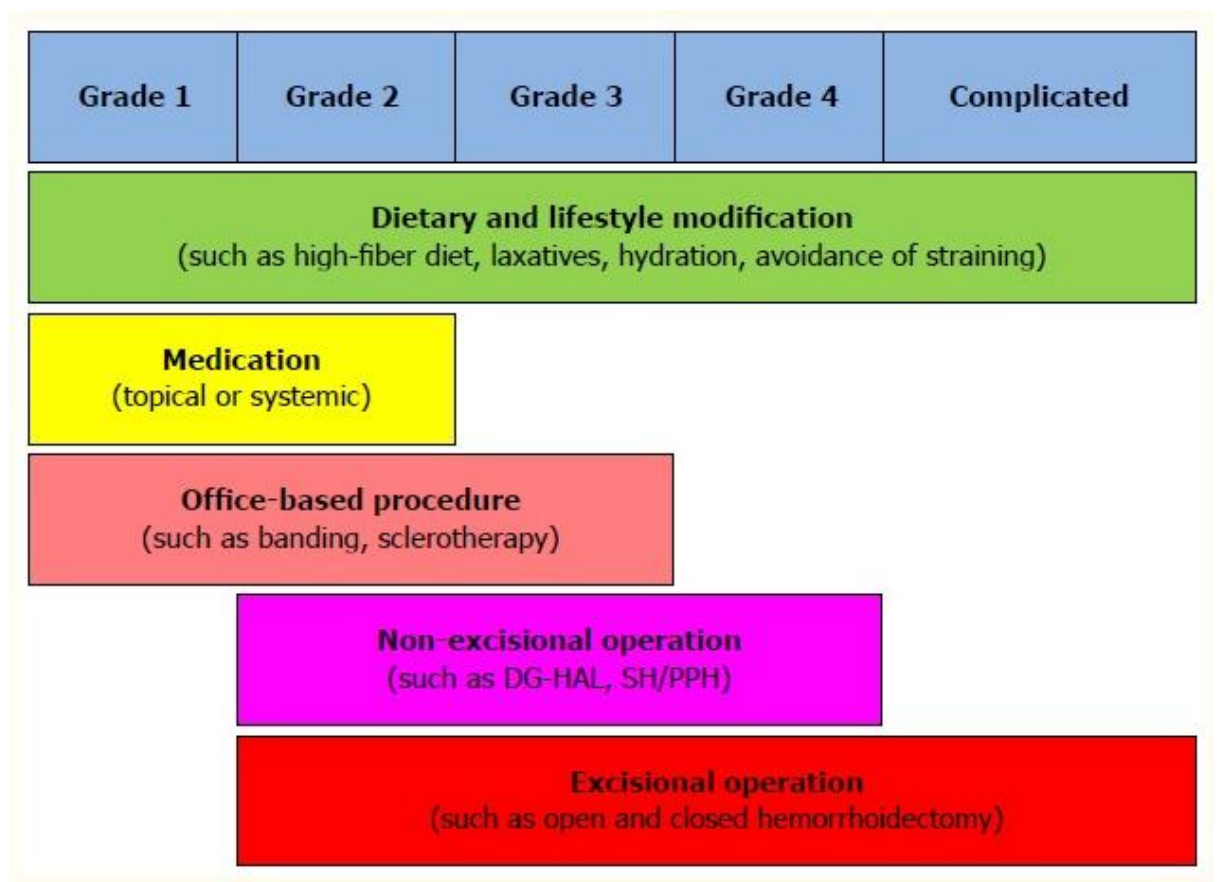
(2) Second-degree haemorrhoids (or grade II): The anal cushions prolapse through the anus on straining but decrease naturally;

(3) Third-degree haemorrhoids (or grade III): The anal cushions prolapse through the anus on straining or effort and necessitate manual replacement into the anal canal;

(4) Fourth-degree haemorrhoids (or grade IV): The prolapse breaks out and is not reducible.(7)

**d) Management:**

Present management of internal haemorrhoids based on their severity and grade of prolapse is as follows. The following image represents the management options of different grades of the haemorrhoids. (9)



DG-HAL: Doppler-guided haemorrhoidal artery ligation; SH: Stapled hemorrhoidopexy; PPH: Procedure for prolapse and haemorrhoids.

The treatment options for different grades of haemorrhoids were described by VarutLohsiriwat in the study. (2)



Treatments	Grade I	Grade II	Grade III	Grade IV
Dietary and lifestyle modification	×	×	×	×
Medical treatment	×	×	×- selected	
Non-operative treatment				
Sclerotherapy	×	×		
Infrared coagulation	×	×		
Radiofrequency ablation	×	×		
Rubber band ligation	×	×	×- selected	
Operative treatment				
Plication		×	×	
DGHAL		×	×	
Hemorrhoidectomy		×- selected	×	×
Stapled hemorrhoidopexy			×	×

a. Dietary and lifestyle modification:

- i. Increased intake of dietary fibre and oral fluids,
- ii. Reduced consumption of fat,
- iii. Regular exercise,
- iv. Improving anal hygiene,
- v. Abstaining from both straining and reading on the toilet, and
- vi. Avoiding medication that causes constipation or diarrhoea

b. Medical Treatment:

- i. Oral flavinoids
- ii. Oral Calcium dobesilate

iii. Topical medications such as local anaesthesia, corticosteroids, antibiotics and anti-inflammatory drugs

c. Non-operative treatment:

- i. Sclerotherapy
- ii. Rubber band ligation
- iii. Infrared coagulation
- iv. Radiofrequency ablation
- v. Cryotherapy

d. Operative treatment:

The following table represents the summary of different ideas concerning the pathogenesis of haemorrhoids and associated surgical approaches.

<b>Theory</b>	<b>Short description</b>	<b>Surgical approach</b>
Sliding anal cushions	Hemorrhoids develop when the supporting tissues of the anal cushions disintegrate or deteriorate	Hemorrhoidectomy, plication
Rectal redundancy	Hemorrhoidal prolapse is associated with an internal rectal prolapse	Stapled hemorrhoidopexy
Vascular abnormality	Hyperperfusion of arteriovenous plexus within anal cushion results in the formation of hemorrhoids	Doppler-guided hemorrhoidal artery ligation

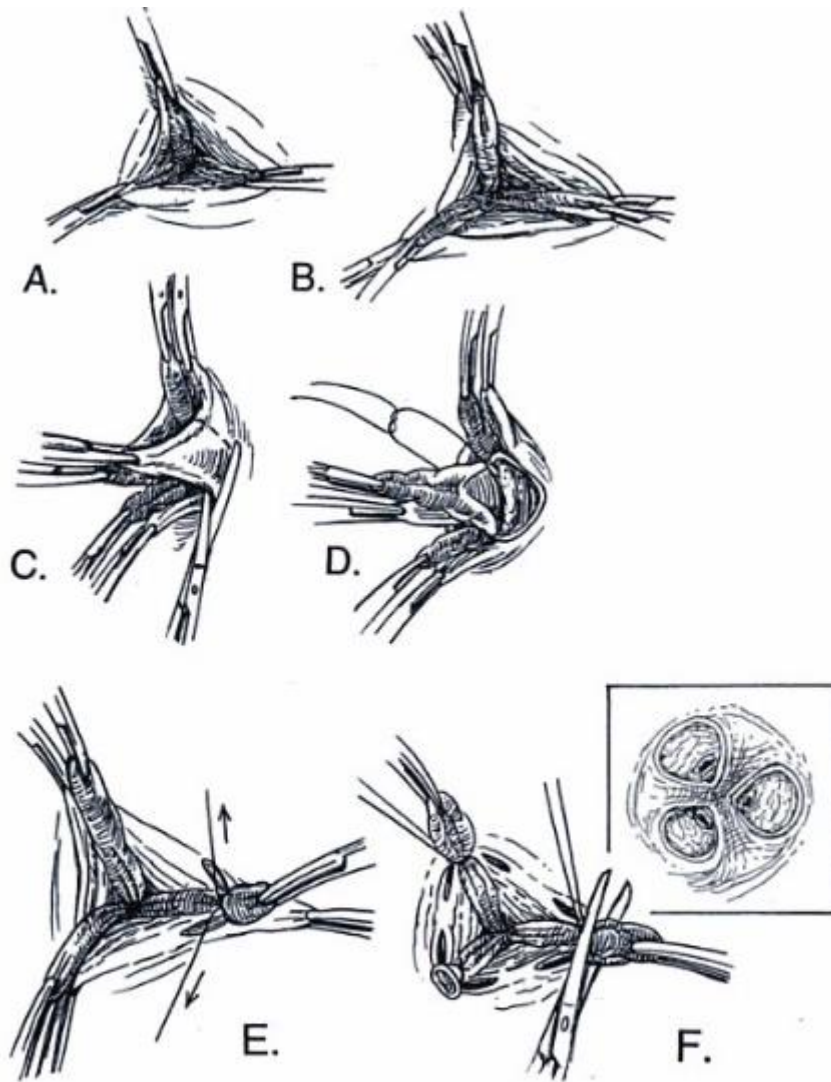
The following is the list of surgical options for treatment of haemorrhoids.

- i. Traditional Surgery
- ii. Stapled Haemorrhoidopexy (PPH Procedure)
- iii. Harmonic Scalpel Haemorrhoid surgery
- iv. Laser Surgery for Haemorrhoids
- v. Atomizing Haemorrhoids.

**Milligan-Morgan haemorrhoidectomy:**

This is the most frequently used procedure and is still believed to be the most effective surgical procedure for managing haemorrhoids. Open haemorrhoidectomy is performed safely, easy, simple and cost-effective. The commonest complications of this procedure are postoperative discomfort, acute urine retaining and haemorrhage.

The classical “external dissection and internal ligation” or Milligan-Morgan procedure, is the normal management for mixed haemorrhoids. It is the technique of choice for third- and fourth-degree haemorrhoids.



**FIGURE 8** Open (Milligan-Morgan) hemorrhoidectomy: (A) external hemorrhoids grasped with forceps and retracted outward; (B) internal hemorrhoids grasped with forceps and retracted outward with external hemorrhoids; (C) external skin and hemorrhoid excised with scissors; (D) suture placed through proximal internal hemorrhoid and vascular bundle; (E) ligature tied; (F) tissue distal to ligature is excised. Insert depicts completed three bundle hemorrhoidectomy.

(15)



(16)

In this technique, haemorrhoidal tissue and vessels involved are removed in the similar method as that in Ferguson's technique, comprising the assignment of a suture at the haemorrhoid pedicle, but the incisions are left open. (17)

**Ferguson haemorrhoidectomy:**

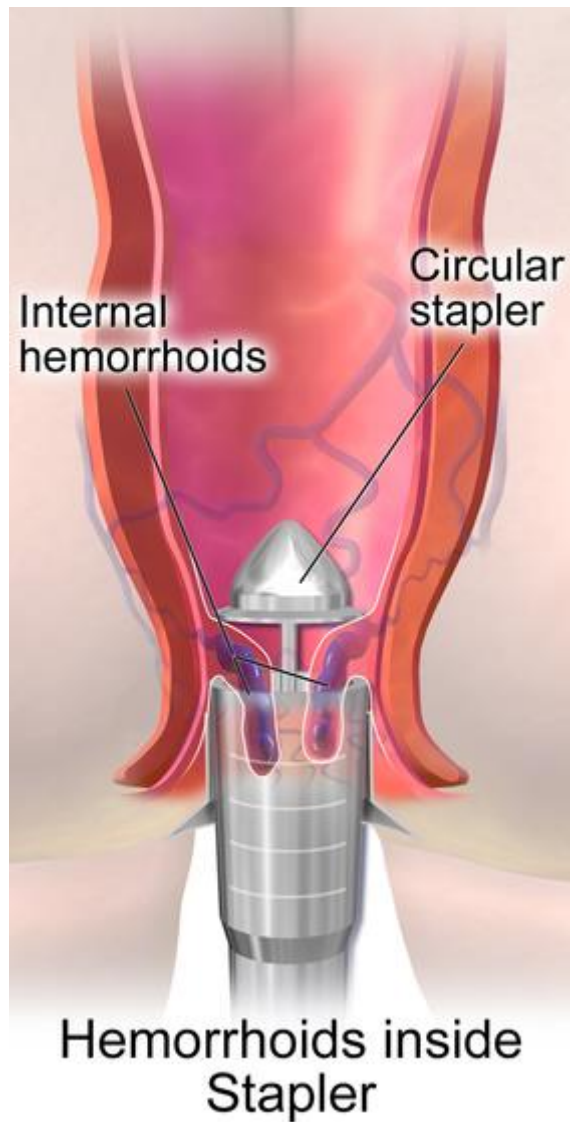
Haemorrhoidectomy is thought to be an effective, although excruciating treatment of late second grade, which did not return to non-surgical approaches or third-grade. In Europe, the Milligan-Morgan procedures is more frequently in usage, while in the United States of America, the closed haemorrhoidectomy technique, as demonstrated by Ferguson and Heaton, is a commonly used. Closed haemorrhoidectomy is considered to be less painful and effects in quick wound healing.

This is established by Dr. Ferguson in the United States, in 1952. This is a modification of the Milligan-Morgan procedure (above), whereby the incisions are completely or partly sealed with absorbable running suture.



### **Stapled haemorrhoidectomy:**

Stapled haemorrhoidectomy, otherwise called as stapled haemorrhoidopexy, is an operative technique that includes the excision of an unusually distended haemorrhoidal tissue, which is later followed by the relocation of the outpouching haemorrhoidal tissue again back to its usual anatomic location. Severe cases of haemorrhoidal prolapse will usually necessitate surgery. Newer surgical techniques comprise stapled trans anal rectal resection (STARR) and process for prolapse and haemorrhoids (PPH). Both STARR and PPH are contraindicated in individuals with either enterocele or anismus. (23)



### **Complications of Haemorrhoid Surgery**

Early Complications Include:

- 1) Postoperative pain
- 2) Wound infections
- 3) Postoperative bleeding.

Late Complications Include:

- 1) Anal stenosis.
- 2) Formation of skin tags.
- 3) Recurrence.
- 4) Anal fissure.

### **iii. Post-operative pain:**

Post-operative pain scores were significantly low in the Group of Open haemorrhoidectomy than Group of Closed haemorrhoidectomy patients during first 24 hours and at first bowel movements. Some studies have showed that Haemorrhoidectomy with concomitant internal lateral sphincterotomy did not decrease post-operative pain, and augmented the risk of post-operative incontinence. Some studies have showed that the adding of lateral anal sphincterotomy to open haemorrhoidectomy appears to have a positive effect on reducing postoperative pain in few of the patients, without increasing the post operative complication rate.

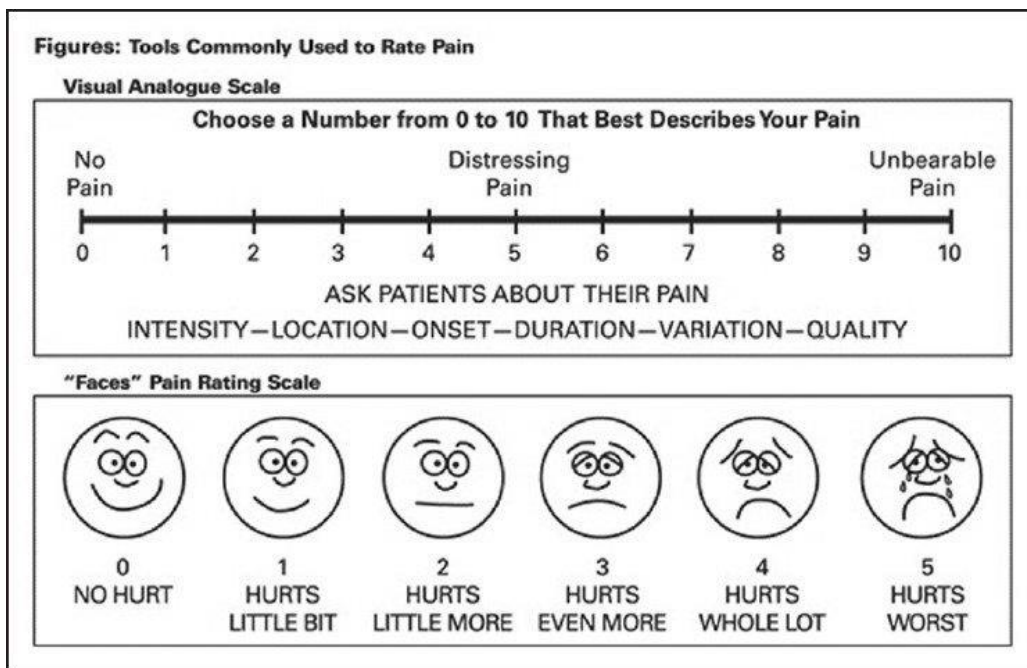
Lateral Anal Sphincterotomy has effectively decreased the occurrence of urinary retention during postoperative period and stenosis of anal canal significantly. More importantly the procedure has decreased the post-operative pain and need for the analgesics.



A Meta-analysis by Wei-Guo Wang et al, showed that LAS effectively reduces the level of post-operative pain, and analgesic requirement, and reduces the incidence of the anal stenosis.

**iv. Wong Baker Faces pain rating scale:**

The face pain rating scale is an equivalent to Visual Analogue Scale, which was originally created with children for children to help them communicate about their pain. Now the scale is used around the world with people ages 3 or older, facilitating communication and improving assessment so pain management can be addressed. This self-assessment or Subjective pain score must be understood by the patient, so they are able to choose the face that best illustrates the physical pain they are experiencing.



**RESEARCH QUESTION OR**  
**HYPOTHESIS:**

Out of the two procedures namely Lateral Anal Sphincterotomy and Maximal Anal Dilatation, which is more effective in post operative pain reduction, when added as an adjunct to Open Hemorrhoidectomy?

# **METHODOLOGY**

Methodology of this study is described under the following headings:

**5.1. Study Subjects:**

This consists of all patients who will get admitted with haemorrhoids grade 2 (refractory to medical treatment), 3, 4 in the Dept. of General Surgery, Stanley Medical College, Chennai, for a study period of one year.

**5.2. Study Design:**

Prospective Randomized Study

**5.3. Study setting:**

General Surgery ward, Govt. Stanley Medical College Hospital, Chennai.

**5.4. Sampling Procedure:**

Random Sampling – Patients to be subjected to Lateral Internal Sphincterotomy or Maximal Anal Dilatation were randomly selected and were divided into two groups –Group A and Group B respectively.

**5.5. Inclusion Criteria:**

1. Patients of age > 18 years of age and <50 years of age
2. Patients who have clinically and colonoscopically confirmed diagnosis of grade 2 hemorrhoids refractory to medical treatment/grade 3/grade 4 haemorrhoids.
3. Patients who are willing to participate in the study and have given written consent.

## **5.6. Exclusion criteria:**

1. Patients less than 18 years of age or more than 50 yrs of age
2. Patients with haemorrhoids and other anal pathology like fistula, fissure or other colorectal diseases
3. Patients with grade 1 haemorrhoids
4. Patients whose general condition is not stable
5. Patients not willing to participate or willing to sign the consent form for colonoscopy

## **5.7. Sample Size:**

50 cases of grade 2, 3 and 4 haemorrhoids.

Sample size = (Distribution fo 6.5%) / (Margin of error%/ Confidence level score)<sup>2</sup>

Based on previous studies:

A distribution of 6.5% was chosen (Population proportion)

Confidence level = 95%

Margin of error = 5%

Based on the above formula:

Sample size required = 49 (rounded off to 50)

## **5.8. Study procedure:**

CLINICAL HISTORY AND PHYSICAL EXAMINATION:

A complete history with regards to the patients' chief complaints was obtained from all patients. A detailed physical examination was performed, with emphasis on Digital per rectal examination and proctoscopy/colonoscopy in order to establish a diagnosis.

#### PRE-OPERATIVE INVESTIGATIONS:

A written informed consent was obtained from all patients. The following Investigations were carried out pre-operatively on all patients-

- a. Complete Blood Count
- b. Blood Urea, Random blood sugar
- c. Serum creatinine
- d. Liver function Test/Coagulation Profile
- e. Plain Chest X Ray
- f. ECG
- g. Ultra sonography of the abdomen & pelvis
- h. Colonoscopy

#### PRE-OPERATIVE PREPARATION:

All patients were kept on Overnight starvation, the day before the surgery. The perineum, lower abdomen, thighs and back were shaved. A saline enema was given on the night before the surgery and on the morning of the operation. Pre-operative antibiotics were given.

#### OPERATION:

## MILLIGAN-MORGANHAEMORRHOIDECTOMY-

Spinal anaesthesia was given to all the patients. Patients were placed in the Lithotomy position. The perineum is painted and draped. The patient is placed with the feet in stirrups, and the anal canal gently dilated.

A proctoscope is inserted to identify the site of the three principal haemorrhoids. Tissue forceps are applied to each pile and to the skin adjacent to the haemorrhoid. The procedure is started with the 7 o'clock haemorrhoid, and to be finished with the 11 o'clock haemorrhoid, so that the operation field is not obscured by bleeding. The tissue forceps holding the haemorrhoid and its adjacent skin is grasped in the left hand. A V shaped incision is made in the surrounding perianal skin with scissors.

The cut is deepened towards the anal canal to reveal the lower fibers of the internal anal sphincter. The sphincter is gently swept away with tissue forceps from the haemorrhoid. The scissors are then used to excise the haemorrhoidal tissue within the anal canal, which left the apex of the haemorrhoid with its arterial supply and venous drainage intact for ligature. The pedicle of each haemorrhoid is then enclosed in an arterial clip, and the pedicle is transfixed using nonabsorbable suture material.

Haemostasis secured from the bed of the haemorrhoid by use of cautery. Only then the pedicle is ligated. The ligature is left long so that if any further bleeding occurred, the pedicle could be easily identified and delivered into the operative field. Each haemorrhoid is dealt with in the same manner; however,



well-established skin bridges between each V-Shaped segment of excised skin are maintained. The patients are subjected to a LAS or a MAD as per their randomly allotted group.

**PICTURE 1 – GRADE 3 HAEMORRHOIDS**



**PICTURE 2 – CLASSICAL MMH**



**LATERAL ANAL SPHINCTEROTOMY (OPEN TECHNIQUE) – (GROUP A)**

An anal speculum is inserted to expose the lateral aspect of the anal canal. A transverse incision is made just outside the anal canal at the 3 o'clock position for a length of approximately 1.0 to 1.5 cm. By blunt dissection, the fibres of the external sphincter are separated to develop the intersphincteric plane so that there is no damage to the external sphincter. Once the white fibres of the

internal sphincter has been clearly separated from other structures, the internal sphincter is divided with scissors.



#### MAXIMALANALDILATATION–(GROUPB)

With the patient under spinal anaesthesia, the anal canal is stretched maximally using four fingers until the bands gave way, till the anal canal permitted all four fingers, informing the anaesthetist. At the end of the operation, an anal speculum is inserted to be absolutely certain that there is complete haemostasis. Gauze dressings are applied to each haemorrhoidal area.



#### POST-OPERATIVECARE:

All patients will receive antibiotics in the form of Inj. Cipro 500mg TDS and Inj. Metrogyl 500mg TDS with first dose given at time of anesthesia. All patients will be advised SITZ BATH following removal of anal pack post operatively. Post operative pain, pain during the first postoperative bowel motion, early postoperative complications, (urinary retention/reactionary bleeding/flatus or faeces incontinence) and duration of hospital stay will be evaluated. Severity of post-operative pain will be assessed according to the frequency of administration of analgesic, needed to control the pain for a patient and using visual analog scale as given below.

Objective Pain level will be categorised as **‘Mild’ (1 point)** if required analgesics were 02/48hours to control the pain, **‘Moderate’(2 points)** if numbers were 3-4/48hours and **‘Severe’ (3 points)** when analgesics were >4 in

numbers. Patients will be given Tramadol hydrochloride 100mg intramuscularly. Details of the injection time and numbers of analgesic used will be recorded against each patient. From 2nd post-operative day, all the patients will be given laxative 10ml at bed time and advised to continue 3 weeks postoperatively. Subjective pain score will be assessed on the 2<sup>nd</sup> post operative day using Wong Baker's Faces pain rating scale. A combined total score is calculated by adding up objective and subjective pain scores.

#### DISCHARGE:

Patient will be allowed to go home when fully comfortable on oral analgesics, fully mobile and tolerating normal diet.

#### FOLLOWUP:

On the 7th postoperative day (1st follow-up visit for the patients discharged from hospital) a careful digital-rectal examination (DRE) will be done in all the patients to assess the anal tone and anal stenosis if present

# **RESULTS**

The mean age of the participants is 36.32 years with a standard deviation of 9.11 years ranging between 18 to 50 years.

The majority of the patients were males (n=36, 72%) and the rest were females (n=14, 28%).

Majority of them were having Grade-III haemorrhoids (n=36, 72%), 16% (n=8) had Grade-II haemorrhoids and 12% (n=6) had Grade-IV Haemorrhoids.

Out of 50 patients, 25 (50%) of them were managed using Lateral Anal Sphincterotomy and 25 of them (50%) were managed using Maximal Anal Dilatation.

Among 50 patients, 33 (66%) of them had normal sphincter tone on day 7 while 8 (16%) of them had low sphincter tone and 9 (n=18%) of them had high sphincter tone.

One-way ANOVA shows that pain management was better using Lateral Anal Sphincterotomy and varies from the group that had maximum anal dilatation.

ANOVA was significant with  $F=60.293$  and p-value very highly significant.

### **Age distribution**

The mean age of the participants is 36.32 years with a standard deviation of 9.11 years ranging between 18 to 50 years. The following table and figure show the age distribution of the patients.

Characteristic	Age in years
<b>Mean</b>	36.32
<b>Median</b>	37.50
<b>Mode</b>	30
<b>Std. Deviation</b>	9.113
<b>Minimum</b>	18
<b>Maximum</b>	50

Table 1: Age Distribution

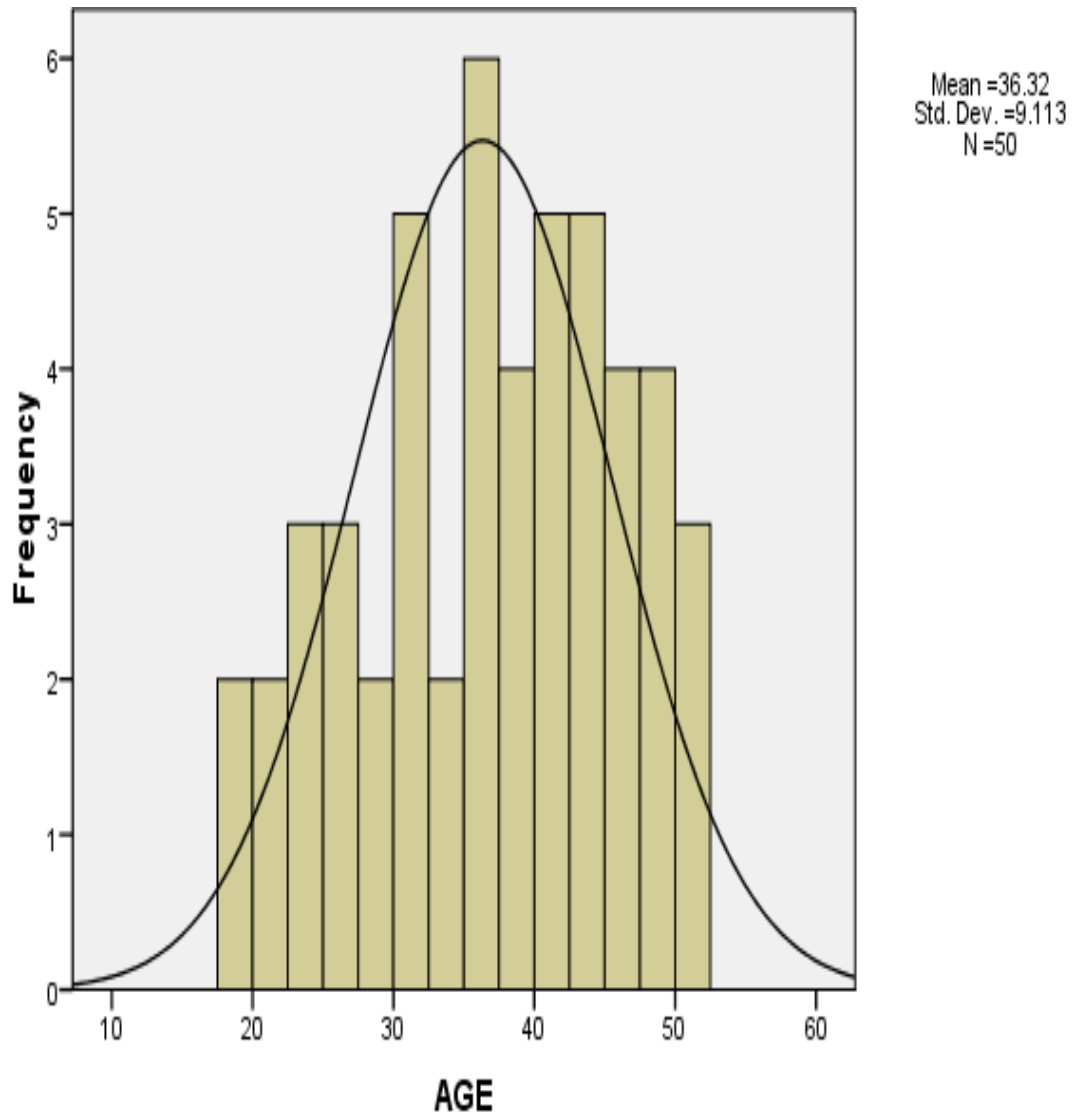


Figure 1: Age Distribution

### Gender Distribution

The majority of the patients were males (n=36, 72%) and the rest were females (n=14, 28%). The following table and figure shows the gender distribution of the patients.



	<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
	FEMALE	14	28.0
	MALE	36	72.0
	Total	50	100.0

Table 2: Gender Distribution

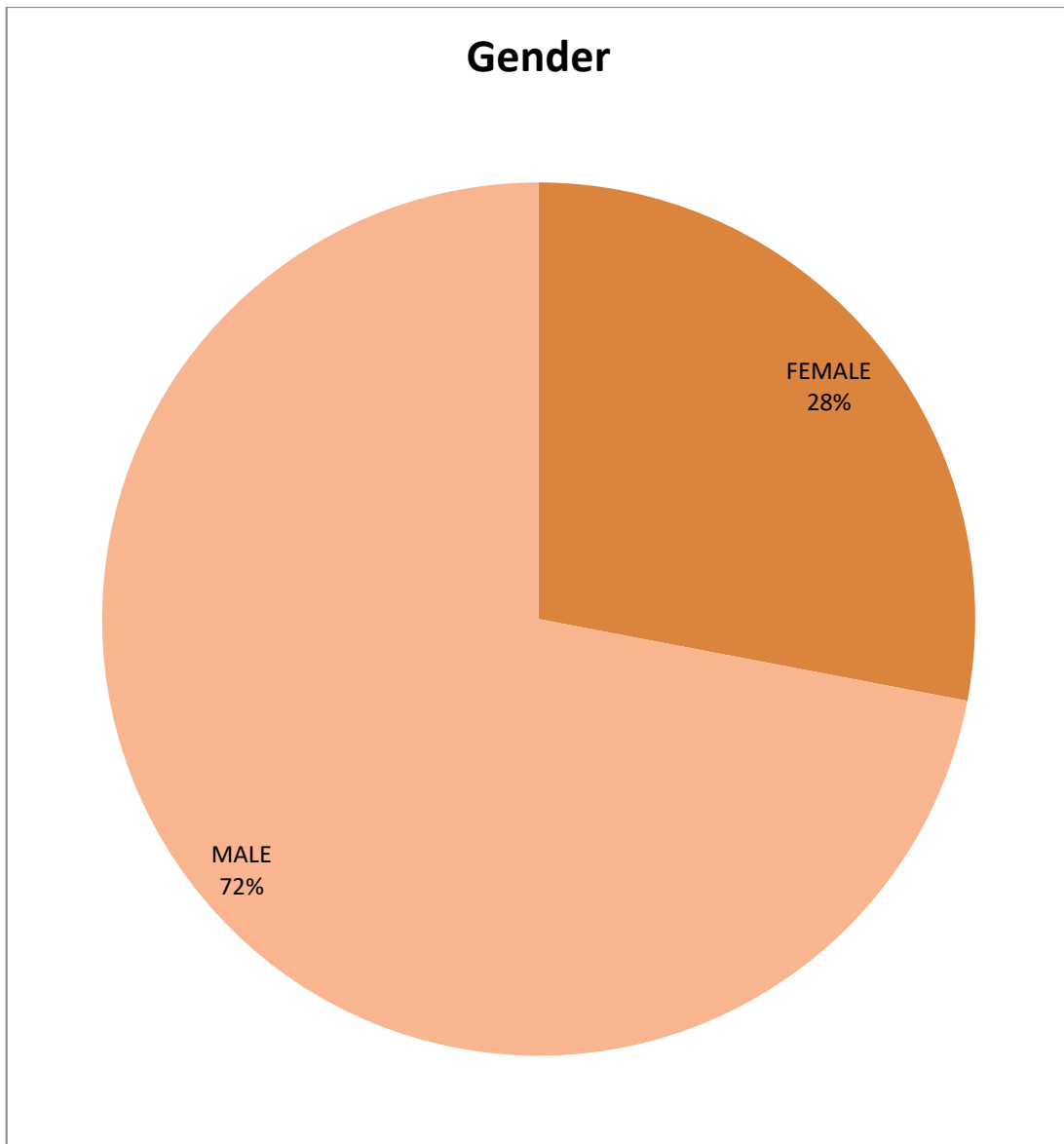


Figure 2: Gender Distribution

**Diagnosis**

Majority of them were having Grade-III haemorrhoids (n=36, 72%), 16% (n=8) had Grade-II haemorrhoids and 12% (n=6) had Grade-IV Haemorrhoids. The following table and figure shows the diagnosis of the patients.

Haemorrhoids	Frequency	Percent
GRADE II	8	16.0
GRADE III	36	72.0
GRADE IV	6	12.0
Total	50	100.0

Table 3: Diagnosis

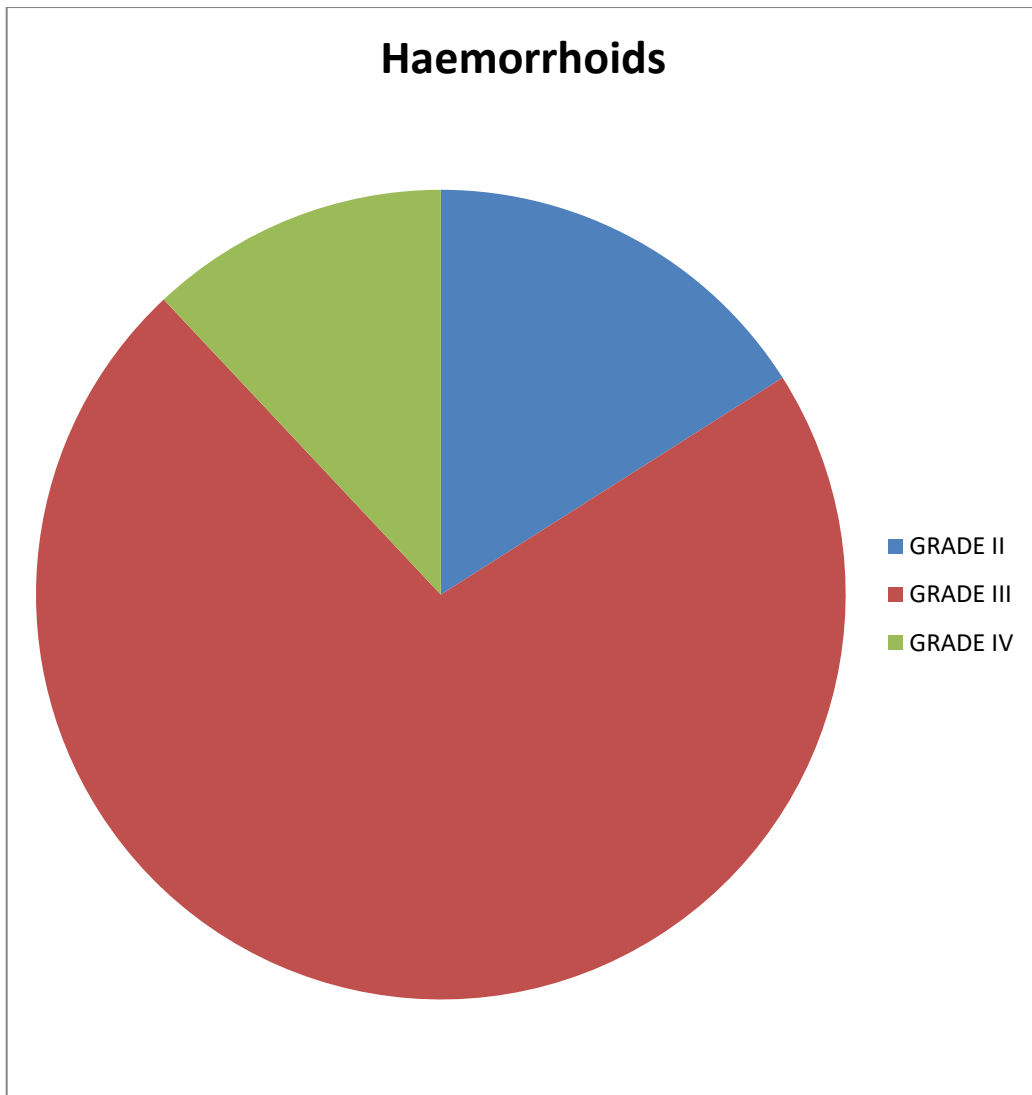


Figure 3: Diagnosis

#### **Post-operative pain management**

Out of 50 patients, 25 (50%) of them were managed using Lateral Anal Sphincterotomy and 25 of them (50%) were managed using Maximal Anal

Dilatation. The following table and figure shows the post-operative pain management of the patients.

	<b>Frequency</b>	<b>Percent</b>
Post-operative pain management		
Lateral Anal Sphincterotomy	25	50.0
Maximal Anal Dilatation	25	50.0
Total	50	100.0

Table 4: Post-operative Pain Management

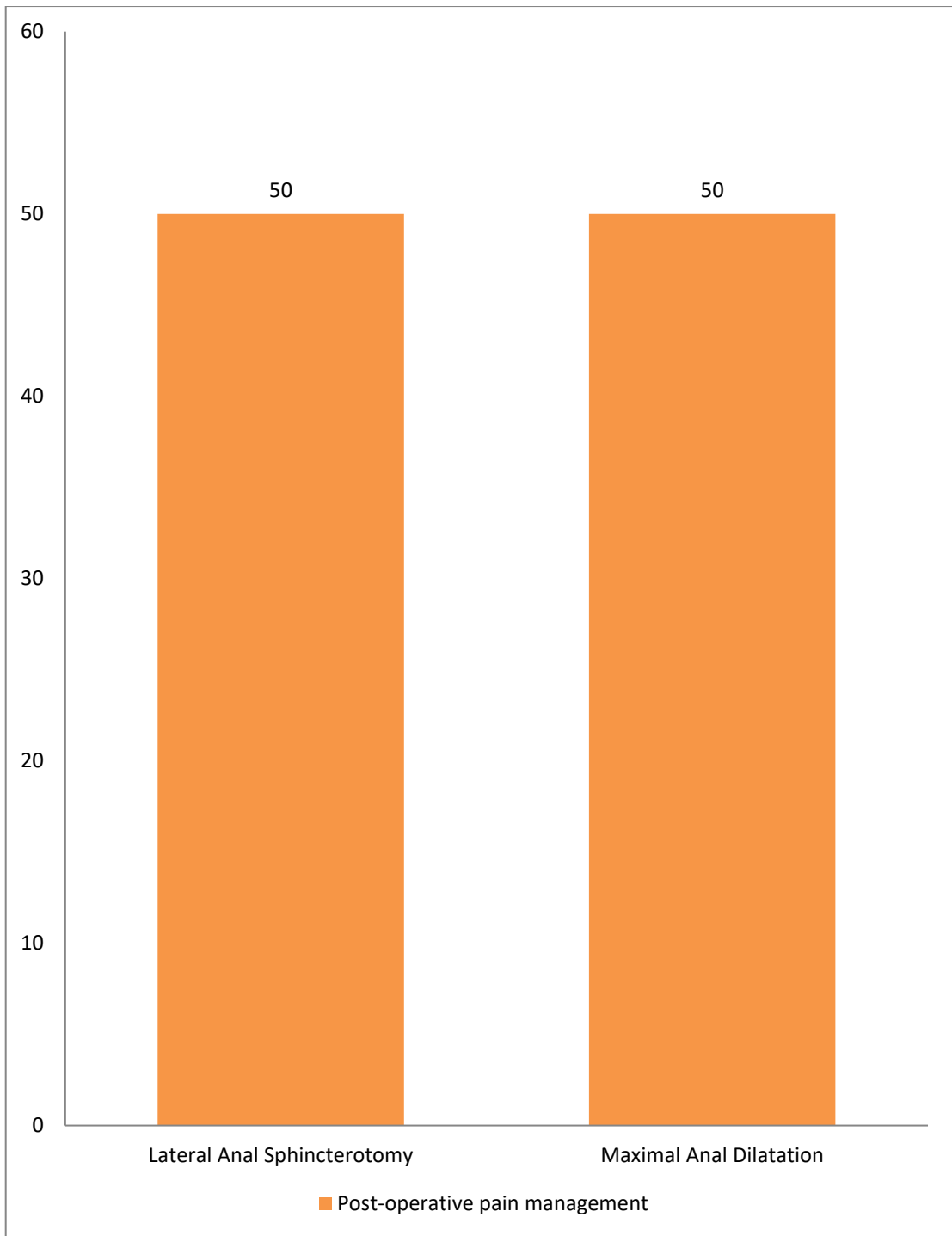


Figure 4: Post-operative Pain Management

### Post-operative sphincter tone on day 7

Among 50 patients, 33 (66%) of them had normal sphincter tone on day 7 while 8 (16%) of them had low sphincter tone and 9 (n=18%) of them had high sphincter tone. The following table and figure shows Post-operative sphincter tone on day 7.

Post-operative sphincter tone on day 7	Frequency	Percent
HIGH	9	18.0
LOW	8	16.0
NORMAL	33	66.0
Total	50	100.0

Table 5: Post-operative sphincter tone on day 7

### Post-operative sphincter tone on day 7

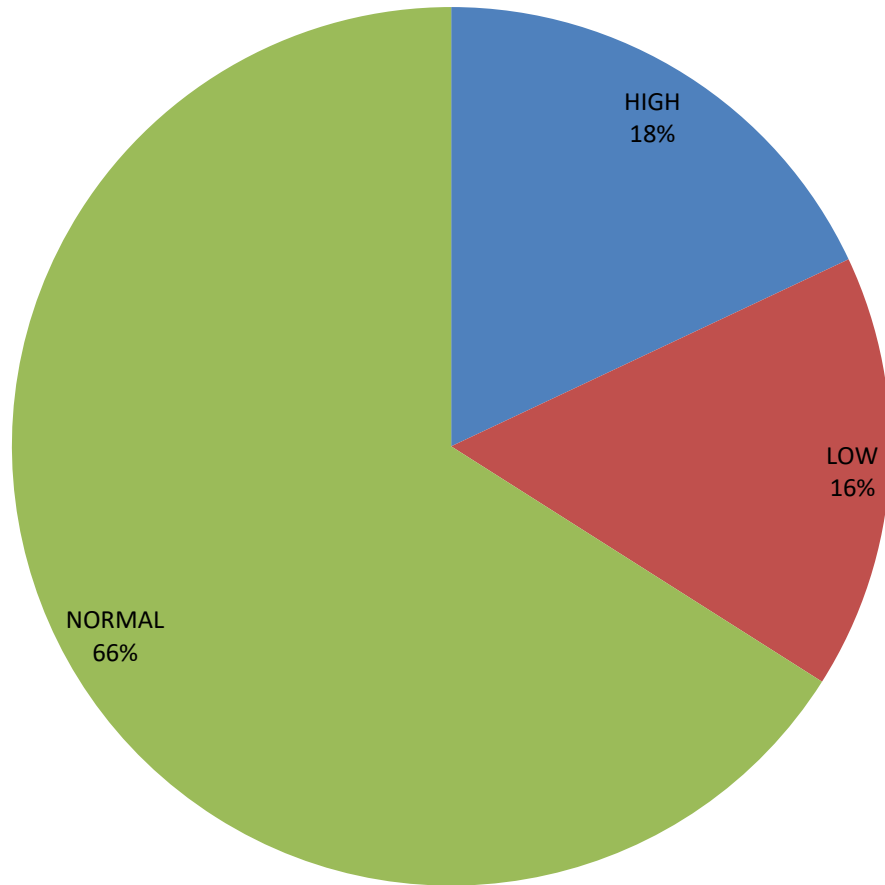


Figure 5: Post-operative sphincter tone on day 7



### Scoring and comparison of pain between two groups

The following tables and figures show the comparison of pain between the two groups. One-way ANOVA shows that pain management was better using Lateral Anal Sphincterotomy and varies from the group that had maximum anal dilatation. ANOVA was significant with  $F=60.293$  and p-value very highly significant.

Objective Pain	Lateral Anal Sphincterotomy	Maximal Anal Dilatation
<b>Mean</b>	.88	1.52
<b>Median</b>	1.00	2.00
<b>Mode</b>	1	2
<b>Std. Deviation</b>	.666	.872
<b>Minimum</b>	0	0
<b>Maximum</b>	2	3

Table 6: Objective Pain

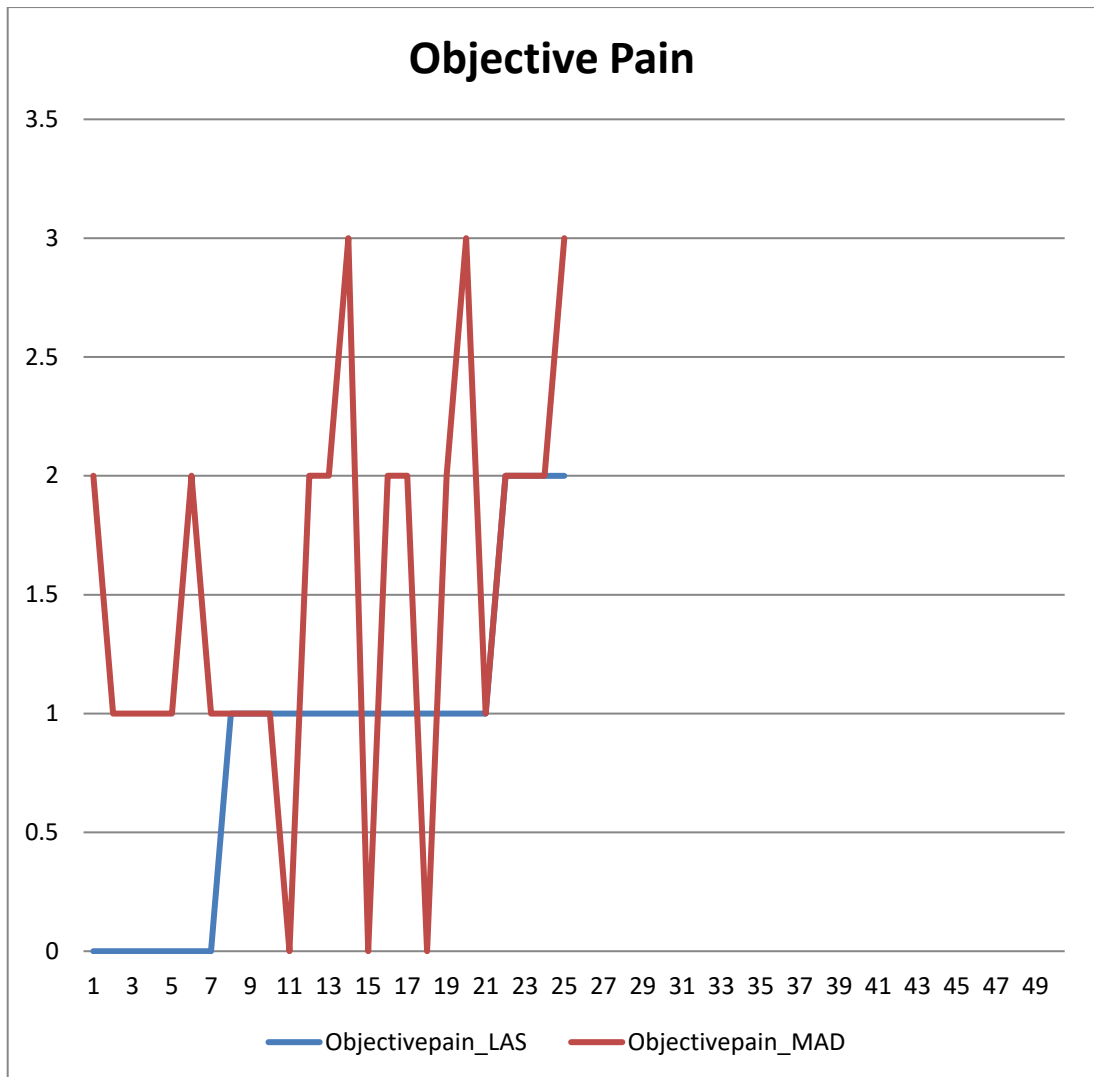


Figure 6: Objective Pain

Subjective Pain	Lateral Anal Sphincterotomy	Maximal Anal Dilatation
<b>Mean</b>	2.16	2.64
<b>Median</b>	2.00	2.00
<b>Mode</b>	2	2
<b>Std. Deviation</b>	.554	.860
<b>Minimum</b>	1	2
<b>Maximum</b>	3	4

Table 7: Subjective Pain

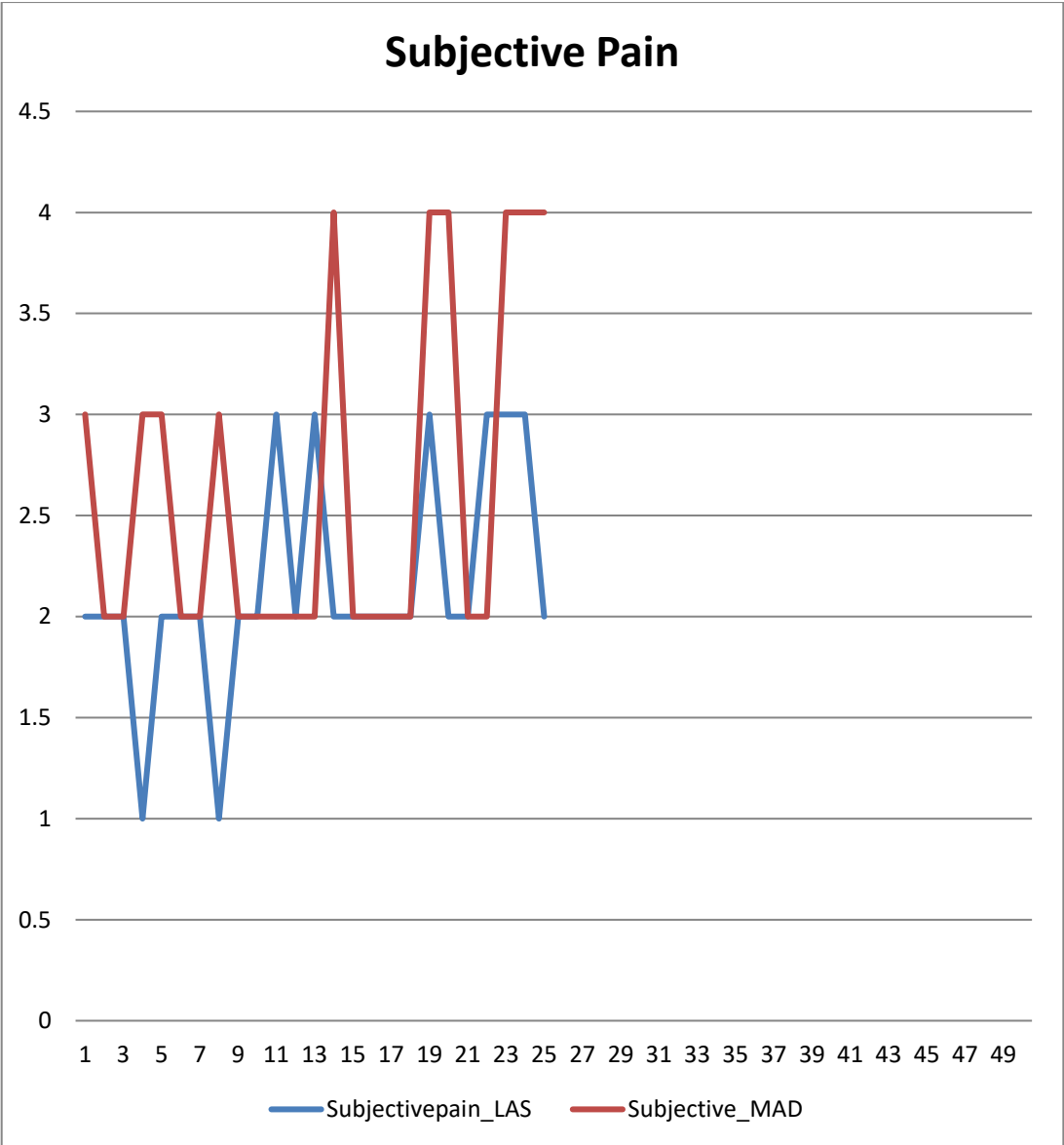


Figure 7: Subjective Pain

<b>Total Pain</b>	<b>Lateral Anal Sphincterotomy</b>	<b>Maximal Anal Dilatation</b>
<b>Mean</b>	3.04	4.16
<b>Median</b>	3.00	4.00
<b>Mode</b>	3	4
<b>Std. Deviation</b>	1.060	1.546
<b>Minimum</b>	1	2
<b>Maximum</b>	5	7

Table 8: Total Pain

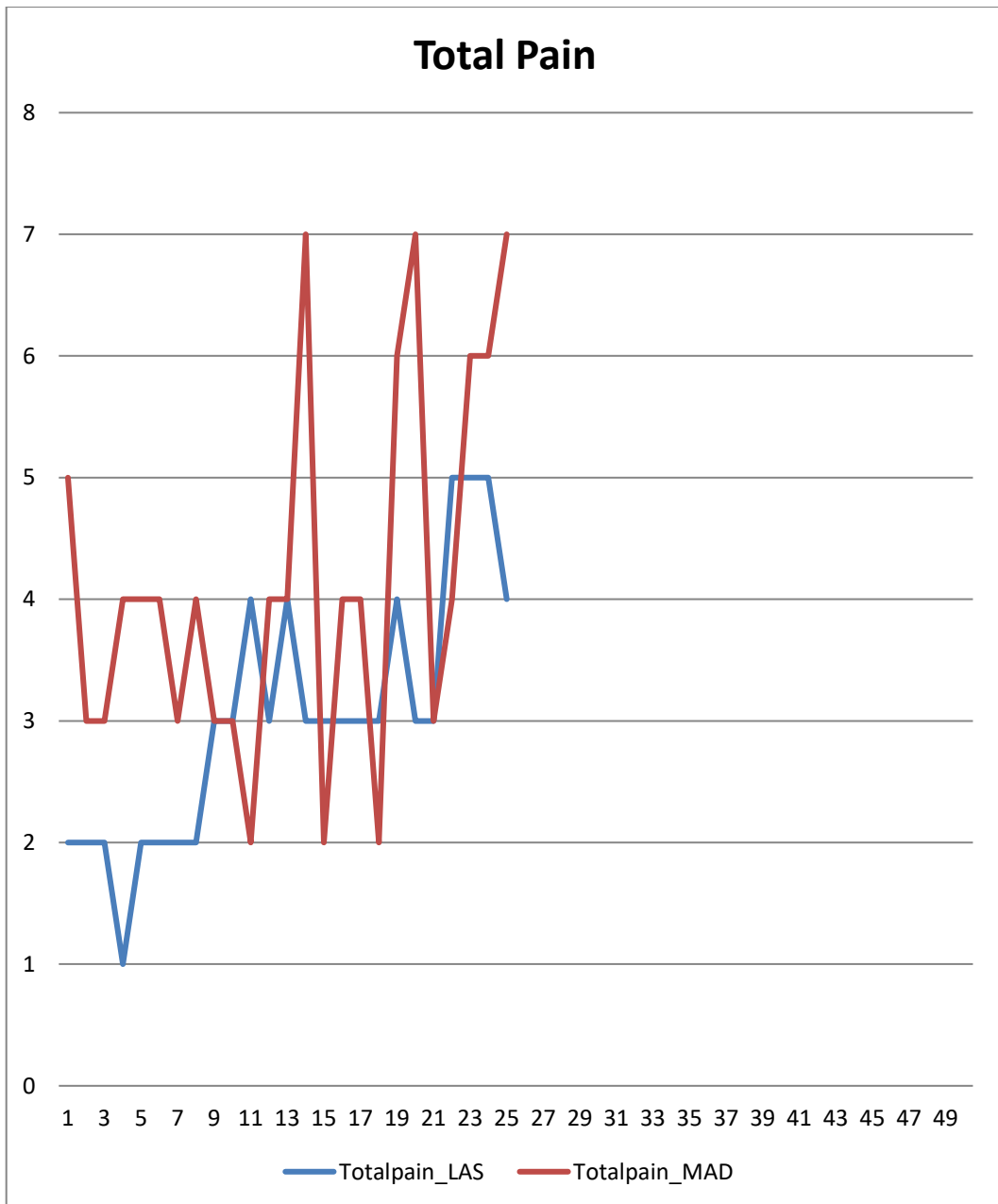


Figure 8: Total Pain

### One-way ANOVA for comparison of pain between the two groups

One-way ANOVA shows that pain management was better using Lateral Anal Sphincterotomy and varies from the group that had maximum anal dilatation. ANOVA was significant with  $F=60.293$  and p-value very highly significant.

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	79.725	3	26.575	60.293	.000
<b>Within Groups</b>	20.275	46	.441		<0.005 Highly Significant
<b>Total</b>	100.000	49			

Table 9: One-way ANOVA for comparison of pain between the two groups

# **DISCUSSION**



Hemorrhoids is a universal problem which is exceedingly difficult to treat with a huge rate of recurrence. Hemorrhoidectomy which is considered as the cornerstone of treatment for haemorrhoids has a significant association with post operative pain, which can be due to two main reasons. One being strong incidence of high anal sphincter tone in young individuals along with haemorrhoids. The second being, the raw area created by the open hemorrhoidectomy technique which by itself can create significant pain and also acts like a surgical fissure causing reflex sphincteric spasm causing excruciating pain.

So many methods have been followed to manage the post operative pain in open hemorrhoidectomy namely topical anaesthetic application, maximal anal dilatation and so on. Topical local anaesthetic is not a very effective mode of pain management with regards to open hemorrhoidectomy. Maximal anal dilatation is an effective method of post operative pain reduction but there is evidence of patients still not satisfied with that. Moreover MAD is associated with uncontrolled sphincter damage causing incontinence which becomes difficult to handle. Lateral anal sphincterotomy is another time tested treatment for high anal tone and chronic fissure in ano. LAS relieves the sphincteric spasm effectively and thus can be used as an adjunct to Open Hemorrhoidectomy in reducing its complication of post operative pain. This study aims to compare the effectiveness of Lateral Anal Sphincterotomy and Maximal Anal Dilatation in reducing the post operative pain in Open hemorrhoidectomy.

The summary of the results are as follows:

1. Hemorrhoids is a common problem of the age group between 30 and 40 years of age
2. Majority of the study population was male (n=36, 72%) and the rest were females (n=14, 28%)
3. Haemorrhoids presented to the OPD mostly as Grade III
4. Both LAS and MAD were done on equal number of subjects i.e. 25.
5. One way Anova test was used to test the significance of association between Lateral anal sphincterotomy and post operative pain in the form of combined score of objective and subjective pain scores. It has been proved that the pain management was better using LAS, ANOVA being significant with  $F=60.293$  and p value very highly significant.
6. Sphincter tone at the end of POD 7 was assessed. Majority of the patients who underwent LAS returned to normal sphincter tone at the end of POD 7. Whereas there was an high incidence of patients with high anal tone in the MAD group.

A study by IoannisKanellos et al, aimed at evaluating the effect of lateral internal sphincterotomy on pain after open haemorrhoidectomy. 78 patients with IV degreehaemorrhoids were studied. They concluded that the addition of lateral internal sphincterotomy in to the procedure of open haemorrhoidectomyappears to have anencouraging effect on decreasing postoperative pain in a small number of patients, without distressing the postoperative complications frequency.

A study by Singh B et al, concluded that Botulinum toxin decreases the anal spasm but has no consequence on pain after the procedure of haemorrhoidectomy. Al-Mulhim AS et al, compared the consequence of metronidazole on post conventional haemorrhoidectomy pain in patients with third and fourth degree haemorrhoids. They concluded from their study, that prophylactic metronidazole in Milligan-Morgan haemorrhoidectomy is related with a smaller amount of pain and earlier return to normal activity. In patients undertaking hemorrhoidectomy, addition of surgical internal sphincterotomy effects in less important pain in the postoperative period as associated to those receiving topical application of Diltiazem.

A study by Indru T. Khubchandani et al, assessed the grade of discomfort in patients with and without a sphincterotomy when performance of closed haemorrhoidectomy. Study results showed that there is no difference in the perception of pain after haemorrhoidectomy in patients who had an internal sphincterotomy equated with those who did not. Both the groups were similarly possible to have struggle with control of gas and soiling.

Lewis AA et al, did a trial comparing the maximal anal dilatation, cryotherapy and elastic band ligation as replacements to haemorrhoidectomy in the treatment of large prolapsing haemorrhoids and concluded that haemorrhoidectomy and maximal anal dilatation were equally effective in decreasing symptoms.

Adrian Medina-Gallardo et al, studied the severe pain after the procedure of Milligan-Morgan haemorrhoidectomy among 117 consecutive patients and concluded that Postoperative pain after the procedure of Milligan-Morgan hemorrhoidectomy presently residues a problem for colorectal surgery crews. This includes the usage of opioids analogous to additional major surgical procedure, lastly causing not negligible days of admission charge. The clinical results afterwards the lateral internal sphincterotomy (success rate, 75.3 percent) put forward that this technique is a good alternative in selected patients.

A study by Safwan A Taha proposed that internal anal sphincterotomy should be accepted as a routine procedure in addition to operative haemorrhoidectomy for third and fourth degree haemorrhoids as it vividly recovers the consequence of this rather painful technique and decreases the occurrence of its major postoperative problems. DK Das et al, studied the Effectiveness of Internal Sphincterotomy in decreasing Post-operative Pain after Open Haemorrhoidectomy through a Randomized Comparative Clinical Study. They concluded that adding the procedure of Internal sphincterotomy to open haemorrhoidectomy is an effective technique to decrease post open hemorrhoidectomy pain without substantial morbidity.

Helpfulness of lateral internal sphincterotomy when joined with haemorrhoidectomy by the Milligan-Morgan's technique was studied by Amorotti C et al, through a prospective randomized trial. They concluded that

internal left lateral sphincterotomy (0.8-1 cm) is a harmless process and decreases post-haemorrhoidectomy pain and stenosis.

SeyedVahid Hosseini et al, studied the role of Internal Sphincterotomy in the Management of Haemorrhoids through a Randomized Clinical Trial in 120 patients and recommended that sphincterotomy plus haemorrhoidectomy for patients with in elevation of anal canal pressure recognized by manometry earlier to the operation.

Gennaro Galizia et al, studied Lateral Internal Sphincterotomy Together with Haemorrhoidectomy for Management of Haemorrhoids through a Randomised Prospective Study and concluded that Lateral sphincterotomy escapes pain, urinary retaining, and stenosis, and is safe. Internal sphincterotomy: decreases considerably pain only in the first postoperative period, but not in the medium or long term follow up. It does not upsurge the occurrence of continence impairment when accomplished; does not influence the incidence of the other postoperative complications particularly as regard to medium and long term consequences.

# **CONCLUSION**

Hemorrhoids is the most common anal canal disease causing economical distress to the population worldwide.

The accurate plan of management of haemorrhoids depends on the grade and comfort of the patient. Open hemorrhoidectomy still proves to be the gold standard mode of operative management of haemorrhoids.

There are umpteen number of techniques to reduce the post operative pain related to Open hemorrhoidectomy.

With the above factors and studies and study results it is safe to conclude that Lateral Anal Sphincterotomy is far better than Maximal Anal Dilatation as an adjunct to Open hemorrhoidectomy to overcome the post operative pain severity.

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# **ANNEXURES**

## Appendix I – Proforma

Name :

Age/Sex:

Occupation :

Address:

### CHIEF COMPLAINTS:

- i. Bleeding: duration, amount, colour.
- ii. Pain: duration, nature, association with defecation.
- iii. Mass per anum (reducible spontaneously or manually) o Discharge of pus or mucous.
- iv. Abnormality of bowel habit, pruritus.
- v. Risk factor: constipation, difficulty in passing urine

### PAST HISTORY:

H/O previous surgery

H/O Diabetes Mellitus/Systemic Hypertension/asthma/epilepsy/TB

### PERSONAL HISTORY:

Diet, Sleep. Bowel/Bladder, Smoker/Alcoholic

DRE findings pre op:

Colonoscopic findings pre op:

## POST-OPERATIVE FOLLOW UP:

Patients were observed for post-operative pain for 5 days in post-operative ward, daily morning 8.00 am and 8.pm, pain will be assessed by objective pain scoring as explained earlier, on a scale of 1 to 3 along with Wong Baker's Faces pain rating scale on POD 7. Careful digital rectal examination will be done on POD 7 to asses the anal sphincter tone.

## **APPENDIX II - INFORMED CONSENT**

### **DISSERTATION TOPIC: ROLE OF LATERAL ANAL SPHINCTEROTOMY VERSUS MAXIMAL ANAL DILATATION IN REDUCING POST OPERATIVE PAIN AFTER OPEN HEMORRHOIDECTOMY – A COMPARATIVE STUDY**

- PLACE OF STUDY: GOVT. STANLEY MEDICAL COLLEGE,  
CHENNAI
- NAME AND ADDRESS OF PATIENT:
- I, \_\_\_\_\_ have been informed about the details of the study in my own language.
- I have completely understood the details of the study.
- I am aware of the possible risks and benefits, while taking part in the study.
- I understand that I can withdraw from the study at any point of time and even then, I will continue to receive the medical treatment as usual.
- I understand that I will not get any payment for taking part in this study.
- I will not object if the results of this study are getting published in any medical journal, provided my personal identity is not revealed.

- I know what I am supposed to do by taking part in this study and I assure that I would extend my full co-operation for this study.

Name and Address of the Volunteer:

Signature/Thumb impression of the Volunteer

Date:

Witnesses:

(Signature, Name & Address)

Date:

Name and signature of investigator:

## INFORMED CONSENT

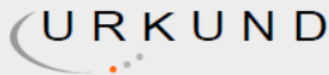
### DISSERTATION TOPIC: ROLE OF LATERAL ANAL SPHINCTEROTOMY VERSUS MAXIMAL ANAL DILATATION IN REDUCING POST OPERATIVE PAIN AFTER OPEN HEMORRHOIDECTOMY – A COMPARATIVE STUDY

- PLACE OF STUDY: GOVT. STANLEY MEDICAL COLLEGE,  
CHENNAI
- NAME AND ADDRESS OF PATIENT:
  - \_\_\_\_\_ஆகியஎனக்கு,  
எனதுசொந்தமொழியில்ஆய்வுவிவரங்கள்பற்றிதெரிவிக்கப்  
பட்டது.  
நான்ஆய்வுவிவரங்கள்பற்றிமுற்றிலும்அறிந்துகொண்டேன்.
  - ஆய்வில்பங்கெடுத்துள்ளநான்,  
சாத்தியமானஅபாயங்களையும்பயன்களையும்நன்குஅறிந்  
திருக்கிறேன்
  - நான்எந்தநேரத்திலும்இந்தஆய்விலிருந்துவெளிவரமுடியும்  
என்றும்அதன்பின்னர்,  
நான்வழக்கம்போல்மருத்துவசிகிச்சைபெறலாம்என்றும்பு  
ரிந்துகொண்டேன்.

- நான்இந்தஆய்வில்பங்குகொள்வதால்எந்தபணமும்பெறமுடியாதுஎன்பதையும்அறிந்தேன்.
- இந்தஆய்வின்முடிவுஎந்தமருத்துவஇதழிலும்வெளியிடப்படலாம்என்றும்,  
எனினும்எனதுதனிப்பட்டஅடையாளம்வெளியிடப்படாதுஎன்றும்நன்குஉணர்ந்தேன்.
- நல்லெண்ணத்துடன்மேற்கொள்ளப்படும்இந்தஆய்வில்பங்குகொள்வேன்என்றும்எனதுமுழுஒத்துழைப்பைநீட்டிப்பேன்என்றும்உறுதியளிக்கிறேன்.
- பெயர்மற்றும்தொண்டர்முகவரி:
- தொண்டர்கையொப்பம்/ பெருவிரல்ரேகை:
- நாள்:
- சாட்சிகள்: (கையொப்பம், பெயர்மற்றும்முகவரி)
- நாள்:
- பெயர்மற்றும்புலன்விசாரணையாளர்கையொப்பம்:



# PLAGIARISM CERTIFICATE



## Urkund Analysis Result

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Significance: 13 %

### Sources included in the report:

<https://www.ncbi.nlm.nih.gov/pubmed/15770383>  
<https://quizlet.com/223334963/colon6-anorectal-landmarks-flash-cards/>  
<https://www.semanticscholar.org/paper/Usefulness-of-Lateral-Internal-Sphincterotomy-in-Kanellos-Zacharakis/f6330772efe5c91803ce1692eca788f4c9252ca0>  
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<https://quizlet.com/13805730/tbl-6-anatomy-q5-flash-cards/>

### Instances where selected sources appear:

28

# **ETHICAL COMMITTEE CERTIFICATE**



**GOVERNMENT STANLEY MEDICAL COLLEGE & HOSPITAL, CHENNAI -01**  
**INSTITUTIONAL ETHICS COMMITTEE**

TITLE OF THE WORK : ROLE OF LATERAL ANAL SPHINCTEROTOMY VS MAXIMAL ANAL DILATATION IN REDUCING POST OPERATIVE PAIN AFTER OPEN HEMORRHOIDECTOMY - A COMPARATIVE STUDY.


PRINCIPAL INVESTIGATOR : DR. PRASANTH NARAYANAN  
DESIGNATION : PG IN MS GENERAL SURGERY  
DEPARTMENT : DEPARTMENT OF GENERAL SURGERY,  
GOVT. STANLEY MEDICAL COLLEGE.

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 07.12.2018 at the Council Hall, Stanley Medical College, Chennai-1 at 10am.

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.

  
MEMBER SECRETARY,  
IEC, SMC, CHENNAI

S. NO	NAME	AGE/SEX	DIAGNOSI GRADE III	POST OP PAIN MANAGEMENT	OBJECTIVE PAIN SCORE	SUBJECTIVE PAIN SCORE	TOTAL PAIN SCORE	SPHINCTER TONE AT POD 7
1	MANJU	25/F	HEMORRHOIDS	MAD	1	3	4	HIGH
2	SUGANTHI	32/F	GRADE II	LAS	1	1	2	LOW
3	ABDUL BASHEER	50/M	GRADE III	MAD	2	2	4	NORMAL
4	NANDHAKUMAR	33/M	GRADE III	LAS	2	3	5	HIGH
5	DHAYALAN	50/M	GRADE III	MAD	1	2	3	NORMAL
6	RAMESH	45/M	GRADE III	LAS	1	2	3	NORMAL
7	SURESH	30/M	GRADE IV	MAD	2	4	6	HIGH
8	SABHIR KHAN	29/M	GRADE III	LAS	2	3	5	HIGH
9	SENTHIL	36/M	GRADE II	MAD	2	4	6	NORMAL
10	PADMAVATHY	23/F	GRADE III	LAS	2	3	5	HIGH
11	SASIKUMAR	48/M	GRADE III	MAD	2	3	5	NORMAL
12	SUBRAMANI	37/M	GRADE III	LAS	0	2	2	NORMAL
13	RAMASAMY	40/M	GRADE III	MAD	1	2	3	LOW
14	RAJENDRAN	35/M	GRADE III	LAS	1	2	3	NORMAL
15	RAMASAMY 42/M		GRADE II	MAD	0	2	2	NORMAL
16	NOORI	35/F	GRADE III	LAS	1	3	4	NORMAL
17	LATHA	38/F	GRADE III	MAD	2	2	4	NORMAL
18	THYAGARAJAN	44/M	GRADE IV	LAS	1	2	3	LOW
19	BALAJI	49/M	GRADE III	MAD	2	2	4	NORMAL
20	PARIVALLAL	39/M	GRADE III	LAS	1	3	4	NORMAL
21	THIRUNAVUKKARASU	38/M	GRADE III	MAD	3	4	7	HIGH
22	SUBRAMANI	35/M	GRADE II	LAS	1	2	3	NORMAL
23	SURYA	22/M	GRADE II	MAD	1	2	3	NORMAL
24	SAMUNDI	29/M	GRADE III	LAS	0	2	2	LOW

25	DHAMODHARAN	30/M	GRADE II	MAD	0	2	2	NORMAL
26	RAJALAKSHMI	30/F	GRADE III	LAS	1	2	3	NORMAL
27	SONIYA	19/F	GRADE III	MAD	2	2	4	NORMAL
28	SUGUMAR	39/M	GRADE III	LAS	1	2	3	NORMAL
29	ARASU	45/M	GRADE III	MAD	1	2	3	NORMAL
30	DINESH KUMAR	24/M	GRADE IV	LAS	0	2	2	NORMAL
31	KASINATHA DURAI	43/M	GRADE III	MAD	1	3	4	NORMAL
32	ASIFA	18/RF	GRADE III	LAS	0	1	1	NORMAL
33	BALKIS BEGUM	40/F	GRADE III	MAD	1	3	4	NORMAL
34	SEKAR	40/M	GRADE IV	LAS	0	2	2	LOW
35	DHARMAN	34/M	GRADE III	MAD	2	2	4	NORMAL
36	RAJASUNDARI	43/F	GRADE III	LAS	1	2	3	NORMAL
37	PRAKASH	49/M	GRADE II	MAD	3	4	7	HIGH
38	KANNAN	45/M	GRADE III	LAS	2	2	4	NORMAL
39	RAVI	43/M	GRADE III	MAD	0	2	2	LOW
40	NAGARAJ	44/M	GRADE III	LAS	1	2	3	NORMAL
41	VIJAYALAKSHMI	42/F	GRADE IV	MAD	2	4	6	HIGH
42	ASHOK	30/M	GRADE III	LAS	1	3	4	NORMAL
43	INDIRAN	21/M	GRADE III	MAD	3	4	7	HIGH
44	KAMALANATHAN	45/M	GRADE II	LAS	1	2	3	NORMAL
45	KAMARAJ	35/M	GRADE III	MAD	2	2	4	NORMAL
46	IMMANUEL VICTOR	25/M	GRADE III	LAS	0	2	2	LOW
47	SUBRAMANI	27/M	GRADE IV	MAD	1	2	3	NORMAL
4	NEELA	23/F	GRADE III	LAS	0	2	2	NORMAL
49	LOKESHWARI	48/F	GRADE III	MAD	1	2	3	LOW
50	SHAHITHA BANU	50/F	GRADE III	LAS	1	2	3	NORMAL