

**A PROSPECTIVE COMPARATIVE STUDY OF
CHEMICAL AND SURGICAL MANAGEMENT OF
FISSURE IN ANO**

Dissertation submitted to

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CERTIFICATE

This is to certify that this dissertation in “**A PROSPECTIVE COMPARATIVE STUDY OF CHEMICAL AND SURGICAL MANAGEMENT OF FISSURE IN ANO**” is a work done by **DR. M.S. VIJAY ANAND**, under my guidance during the period 2005-2007. This has been submitted in partial fulfillment of the award of M.S. Degree in General Surgery (Branch – I) by the Tamilnadu Dr. M.G.R. Medical University, Chennai – 32.

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AIMS OF THE STUDY

- 1) To find the **age and the sex incidence of fissure in ano.**
- 2) To study the **various modes of clinical presentation of fissure in ano** and the **various types of fissure in ano.**
- 3) To evaluate the **effectiveness of topical 0.2% Glyceryl trinitrate** in the symptomatic relief and healing of anal fissures.
- 4) To compare the effectiveness of **lateral anal sphincterotomy** and **chemical sphincterotomy in fissure in ano.**
- 5) To establish **the role of glyceryl trinitrate as the first line treatment** for both acute and chronic fissures.

HISTORY

Moderate anal dilatation was first suggested by **Recamier** – 1838

Popular following its use by **Lord** in 1968.

Internal sphincterotomy – was first described by **Eisenhammer**, who divided the sphincter in posterior position.

Lateral anal sphincterotomy – was described by **Parks** in 1967 and later modified by **Notaras** in 1969.

Klosterhalfen (1989) described the **pathogenesis** of anal fissure related to the **vascular anatomy** in the anus.

Schoutten proposed **Vascular – anal resting pressure hypothesis**.

Sohn – controlled / precise balloon dilatation of anal canal.

LITERATURE REVIEW

SURGICAL ANATOMY OF THE ANAL CANAL

The anal canal commences at the level where the rectum passes through the pelvic diaphragm and ends at the anal verge. The muscular junction between the rectum and anal canal can be felt with a finger as a thickened edge, the **anorectal ring or bundle**.

It lies in the anal triangle of perineum in between the right and left ischioanal fossae, which allow its expansion during passage of the faeces. The sacculations and taenia are absent here (as in rectum).

The anal canal is 3.8cm long. It is directed downwards and backwards. The anal canal is surrounded by inner involuntary and outer voluntary sphincters which keep the lumen closed in the form of an anteroposterior slit.

Relations of the anal canal

Anteriorly

- a. in both sexes: perineal body
- b. in males: membranous urethra and bulb of penis

- c. in females: lower end of the vagina

Posteriorly

- a. Anococcygeal ligament
- b. Tip of the coccyx

Laterally: Ischioanal fossae

All round

Anal canal is surrounded by the sphincter muscles, the tone of which keeps the canal closed.

ANAL CANAL MUSCULATURE

INTERNAL SPHINCTER:

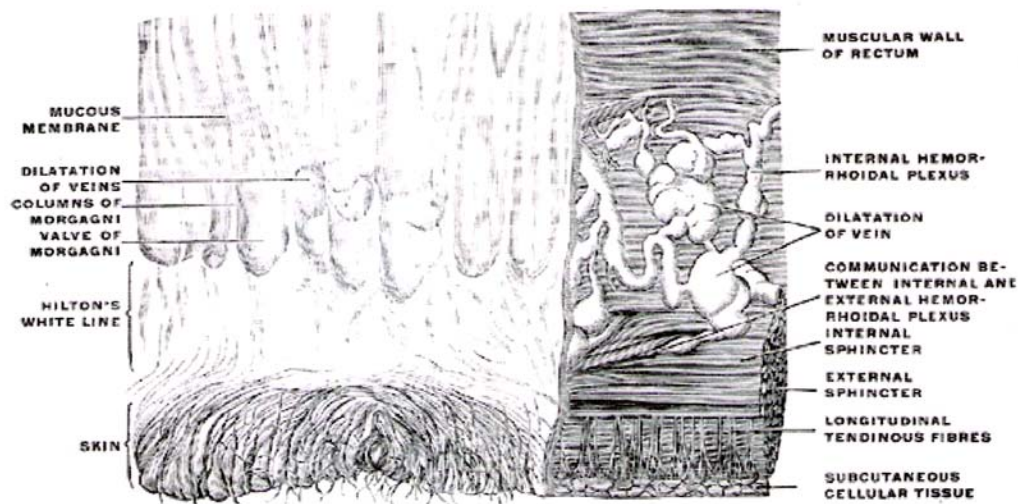
It is a thickened continuation of the circular muscle coat of the rectum. This commences where the rectum passes through the pelvic diaphragm, and ends at the anal orifice; where its lower border can be felt. It is about 2.5 cm long and 2-5 mm thick.

LONGITUDINAL MUSCLE:

It is the continuation of the longitudinal muscle wall of the rectum intermingled with fibres from the **puborectalis**. Its fibres fan out through the lowest part of the external sphincter to be inserted into the true anal and perianal skin. Beneath the anal skin lie the scanty fibers of the **corrugator cutis ani muscle**.

EXTERNAL SPHINCTER:

Formerly subdivided into **deep, superficial and subcutaneous portions**, it is now considered to be one muscle (**Goligher**). Some of its fibers are attached posteriorly into the coccyx, while anteriorly they are inserted into the mid perineal point in the male and in the female, fuse with the sphincter vaginae.



INTERSPHINCTERIC PLANE

Between the two sphincter muscles, is found a potential space, the intersphincteric plane. This plane is important as it contains the basal parts of 8-12 apocrine glands, which can cause infections.

PUBORECTALIS

It plays a key role in maintaining the angle between the anal canal and rectum and hence is essential for **preservation of continence**. There is a close association between the puborectalis portion of levator ani and the external sphincter muscle.

ANORECTAL RING

It marks the junction between the rectum and anal canal. It is formed by the joining of the puborectalis muscle, the deep external sphincter, conjoined longitudinal muscle and the **highest part of the internal sphincter**. It can be clearly felt digitally, especially on its posterior and lateral aspects.

MUCOUS MEMBRANE

The pink columnar epithelium lining the rectum extends through the anorectal ring into the surgical anal canal. The mucosa of the upper anal canal is attached loosely to the underlying structures and covers the internal rectal plexus. Passing downwards, where it clothes the series of 8-12 longitudinal folds, known as the **column of Morgagni**, the mucosa becomes cubical and red in colour; above the anal valves, the mucous membrane becomes plum coloured. Just below the anal valves, there is an abrupt, albeit wavy transition to squamous epithelium, which is parchment colour. This wavy line constitutes the dentate line. The squamous epithelium lining the lower anal canal is thin and shiny, and is known as anoderm. This squamous epithelium differs from the true anal skin in that it has no epidermal appendages. The anoderm passes imperceptibly into the pigmented anal skin.

DENTATE LINE

The dentate line is a most important landmark both morphologically and surgically. It represents the **site of fusion of the proctodeum ani, postallantoic gut** and the portion of anal membrane, remnants of which may frequently be seen as anal papillae situated on the free margin of the anal valves. The dentate line separates:

- Above**
- **cubical epithelium**
 - **autonomic nerves (insensitive)**
 - **portal venous system**

- Below**
- **from squamous epithelium**
 - **from spinal nerves (very sensitive)**
 - **from systemic venous system..**

WHITE LINE OF HILTON

The middle part or transitional zone of the anal canal (15mm) has a bluish appearance because of a dense venous plexus that lies beneath it and muscle coat. The mucosa is less mobile than in the upper part of the anal canal and is referred to as pecten or transitional zone. The lower limit of the pecten often has a whitish appearance because of which it is referred to as white line of Hilton. Hilton's line is situated at the level of the interval between the subcutaneous part of external anal sphincter and the lower border of the internal anal sphincter. It marks the lower limit of

pectin or stratified squamous epithelium which is thin, pale and glossy and is devoid of sweat glands.

ANAL VALVES OF BALL

There are a series of transversely placed semicircular folds linking the columns of Morgagni. They lie along and actually constitute the waviness of the dentate line. They are functionless remnants of fusion of the postallontoic gut with the proctodaeum.

CRYPTS OF MORGAGNI

The anal crypts are small pockets between inferior extremities of column of Morgagni. Into several of these crypts, mostly these situated posteriorly, opens one anal gland by a narrow duct.

ARTERIAL SUPPLY

The anal canal is supplied by branches from the **superior, middle and inferior hemorrhoidal arteries**. The most important is superior hemorrhoidal, whose left branch supplies the left half of the canal by a single terminal branch, while its right has two terminal branches. All the arteries contribute to a rich submucous and intramural plexus.

VENOUS DRAINAGE

The anal veins are distributed in a similar fashion to the arterial supply. The **superior and middle hemorrhoidal veins** drain via **inferior mesenteric vein into the portal venous system**, having become **superior rectal vein** en route. The **superior hemorrhoidal** vein drains the **upper half of anal canal**. The **inferior hemorrhoidal** vein drains the **lower half of anal canal** and the subcutaneous perianal plexus of veins, they eventually join the **external iliac vein on each side**.

LYMPHATIC DRAINAGE

Lymph from **upper half** of anal canal flow upwards to drain into **postrectal lymph nodes** and from there goes to the **paraaortic nodes via inferior mesenteric chain**. Lymph from the **lower half** of anal canal drains on each side first into **superficial** and then into the **deep inguinal nodes**.

INNERVATION OF ANAL CANAL

The internal anal sphincter is tonically contracted through combination of **excitatory and inhibitory control** mediated by **sympathetic and para sympathetic nerves respectively**. The former are postganglionic fibres that travel with the **hypogastric nerves** bilaterally (**L₁, L₂**), whereas the latter are derived from the **sacral nerves (S₂, S₃, S₄)**. Distension of the rectal wall results in relaxation of internal sphincter through the **recto anal inhibitory reflex (RAIR)**. The external sphincter is innervated by **pudendal nerve** bilaterally which originate from **S₂, S₃**.

SENSATION

Free nerve endings can be observed about 1.5cm above the anal valves to the anal verge. **Meissner's corpuscles, Krause's bulbs, Golgi Mazzoni corpuscles and genital corpuscles** respond to **touch, cold, pressure and friction**, respectively. These sensations are carried by the **somatic nerves** through the **inferior hemorrhoidal branch of pudendal nerve**.

SURGICAL SPACES RELATED TO THE ANAL CANAL

1. The submucous space of the Canal lies above the white line between the mucous membrane and the internal sphincter. It contains the internal rectal venous plexus and lymphatics.
2. The perianal space surrounds the anal canal below the white line. It contains subcutaneous external sphincter, the external rectal venous plexus, and the terminal branches of the inferior rectal vessels and nerves. Pus in this space tends to spread to the anal canal at the white line or to the surface of the perineal skin rather than to the ischiorectal space.
3. The ischiorectal space or fossa is a wedge shaped fossa situated on each side of the anal canal below the pelvic diaphragm. Its base is directed downwards, towards the surface, the apex is directed upwards. The main purpose of the fossa is to allow distention of the rectum and anal canal during passage of the faeces.

Both the perianal and ischiorectal spaces are common sites of abscesses.

BENIGN ANAL DISEASES

HAEMORRHOIDS / PILES: - (PILES: latin: BALL)

They are dilated veins occurring in relation to anus. They occur more commonly when intraabdominal pressure is raised (eg: **obesity, constipation, pregnancy**). Classically they occur in the **3,7 & 11'o' clock positions**.

Types:

- (i) Internal**
- (ii) External**
- (iii) Interno External**

Internal and interno external hemorrhoids occur as the veins become engorged as the anal lining descends and is gripped by anal sphincter. The mucosal lining is gathered prominently in these places (**anal cushions**) which can be in the areas of the three terminal branches of the superior hemorrhoidal artery. The anal cushions are present in embryonic life and are necessary for full continence. Straining causes these cushions to slip down and internal hemorrhoids develop in the prolapsing tissues.

Symptoms

Bright red painless bleeding, mucous discharge, prolapse, pain only on prolapse.

Complications

Strangulation, thrombosis, ulceration, Gangrene, fibrosis, suppuration, pylephlebitis.

TREATMENT

Symptomatic Treatment:

Active Treatment:

- i) Injection Treatment (**Mitchell**)
- ii) Banding Treatment (**Barron**)
- iii) Cryo - surgery
- iv) Photocoagulation

Operations:

- i) Open hemorrhoidectomy (**Milligan – Morgan**)
- ii) Closed hemorrhoidectomy - **Fergusson’s**
- **Park’s (Submucous)**
- iii) Endostapling technique (**Longo**).

FISTULA IN ANO:

It is a track lined by granulation tissue that connects deeply in the anal canal or rectum and superficially on the skin around the anus. It usually results from an anorectal abscess which bursts spontaneously or was opened inadequately.

Types:

Two groups depending upon whether **internal opening is above or below the anorectal ring (ie) high level and low level respectively.**

TYPES	STANDARD CLASSIFICATION	PARK’S CLASSIFICATION
SUPERFICIAL	Subcutaneous Low anal	Intersphincteric Transphincteric

DEEP	High anal Pelvirectal	Intersphincteric Transphincteric Supralelevator.
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Clinical Features:

Persistent seropurulent discharge.

Goodsall's Rule:

Fistulae with **external opening** in relation to the **anterior half** of the anus tends to be of **direct** type. Those with an **external opening or openings** in relation to the **posterior half** of the anus, which are much more common usually have **curving tracks** and may be of **horse shoe** variety. **Posteriorly** situated fistulae may have **multiple external openings** which nearly always connect to a **solitary internal orifice, usually midline.**

Treatment:

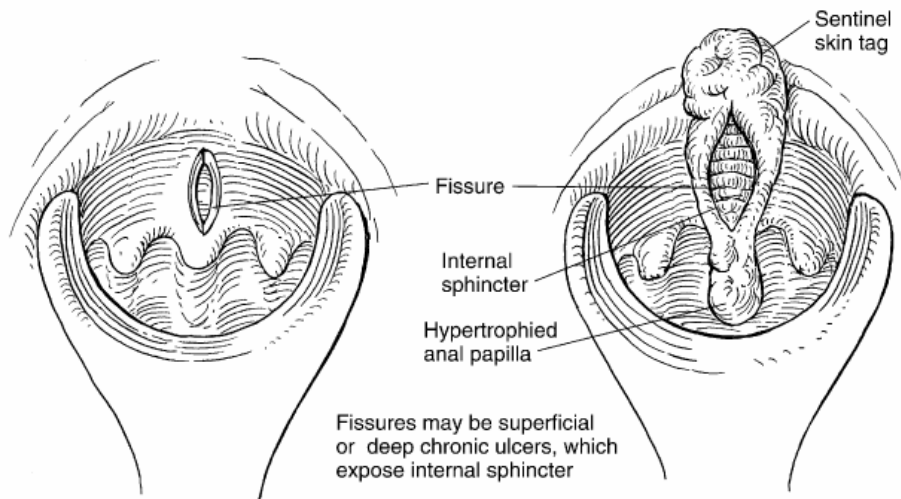
- i) Fistulotomy
- ii) Fistulectomy
- iii) Seton Suturing

iv) Two staged procedure – colostomy and definitive repair.

ANAL FISSURES

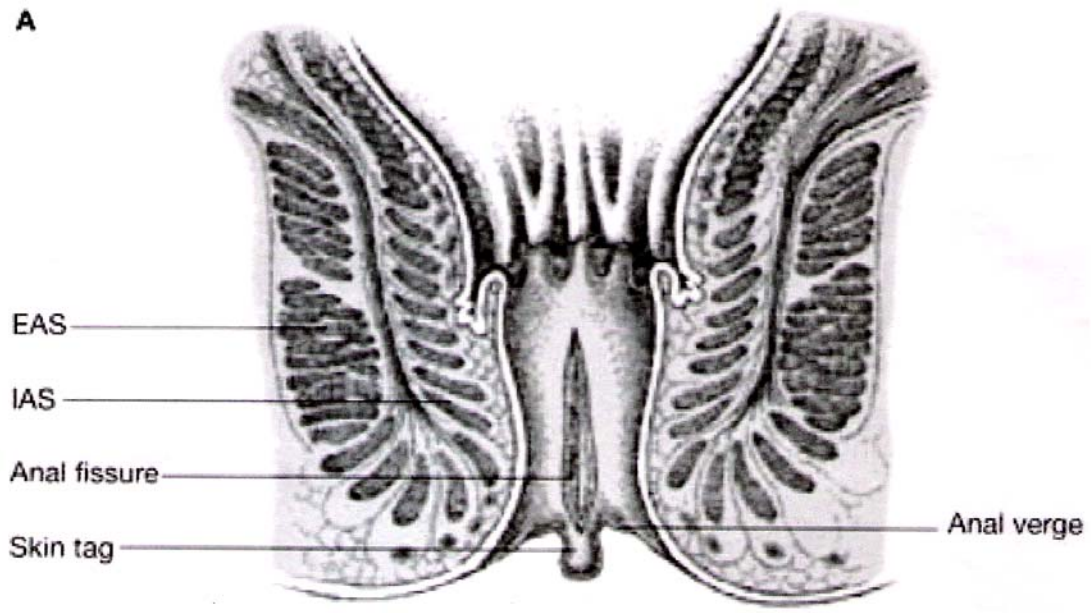
Anal fissure is defined as **linear defect or laceration in the anoderm, located between the dentate line and the anal verge.** An **acute fissure** is a **simple laceration** whereas **chronic fissure** is defined by these **three findings**

- (i) Visible transverse internal muscle fibers at its base.**
- (ii) External skin tag**
- (iii) Hypertrophied papilla**



ANAL PRESSURES

The pressure generated in anal canal to keep it closed during periods of inattention or sleep is called **resting anal pressure or tone**. Approximately **half of Normal Resting pressure** is contributed by the **internal sphincter** where as the **remainder** is provided by **external sphincter and puborectalis**. It is called the **maximal voluntary squeeze** and can only be maintained for a short time. (i.e) **more than two times the resting pressure**.



ETIOLOGY

The causes of fissure in ano are unknown. Primary fissure is often associated with **alteration in bowel habit**, particularly an **episode of constipation** and **rarely a repetitive episode of diarrhea**.

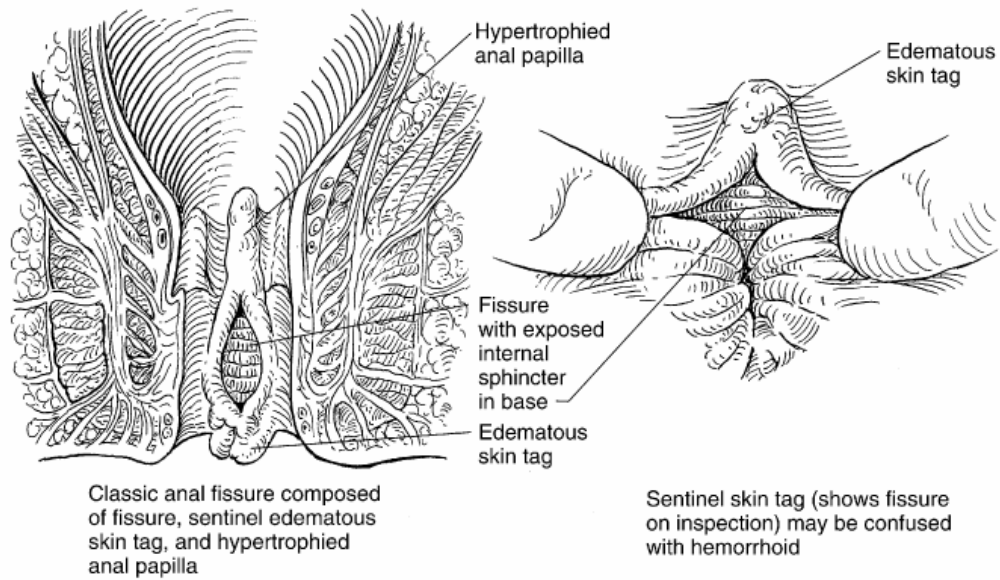
Postpartum fissure may be a result of **tearing of anterior aspect** of anal canal during **child birth**.

Local trauma is believed to be responsible for the initial skin defect that leads to a **boat shaped** ulcer resulting in chronic symptoms.

Primary fissure may be acute. If healing does not occur, fissure becomes chronic, in which case the ulcer enlarges in size.

In **10% of chronic fissure**, there is a **low inter-sphincteric anal fistula** communicating between the base of the fissure and the dentate line.

Anal fissure is associated with **increased resting anal pressure**. **Motility studies** reveal **ultraslow waves** indicative of **increased internal sphincter activity**.



SECONDARY FISSURES

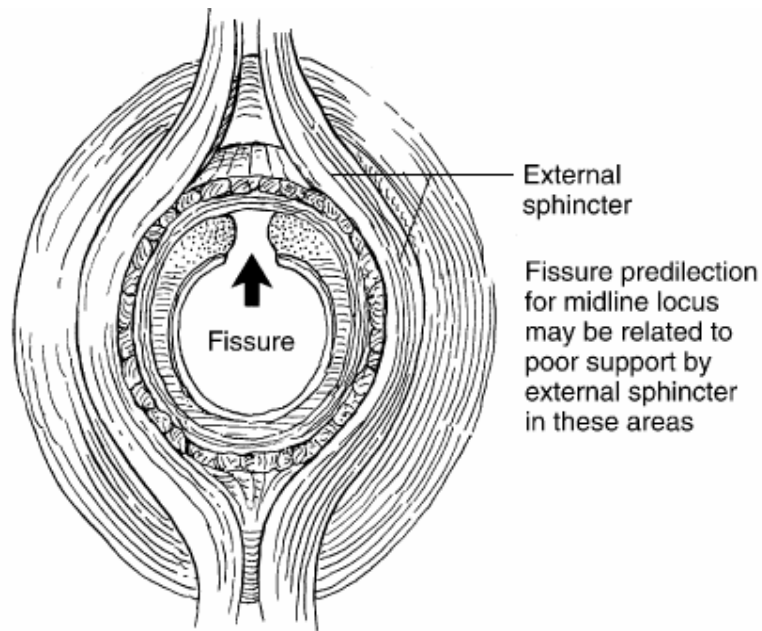
- **Crohn's disease, AIDS.**
- Infections such as **Herpes, Cytomegalovirus, tuberculosis,**
- Occasionally as a complication of a **previous operation** on the anal canal.
- Anal fissures occurring in **Crohn's and AIDS** are **off midline,** have **shaggy large defects** with **undermined edges** and **granulation tissue in the base.**
- **Crohn's and TB** are often **painless.**

- Anal fissures and ulcer complicating **AIDS** are often **intensely painful** and are associated with **incontinence and local sepsis**.

PATHOGENESIS

Because fissures occur most often in the **posterior midline**, various **structural theories** have been proposed as causes, the most compelling of which suggests that the **vascular anatomy of the internal sphincter** may be a factor.

In 1989, **Klosterhalfen** and associates reported on anatomic dissection that detailed the blood supply of internal hemorrhoidal artery. In the majority of the cadaver specimens (85%), the posterior commissure of the anal canal was not directly perfused except by end arterioles. Moreover branching from the sphincter arterioles occur at right angles to the parent vessels and coursed perpendicularly through the circular fibres of the internal sphincter. These anatomic findings establish the possibility of **decreased mucosal perfusion, particularly in the posterior midline**. In addition, **sphincter spasm** or **hypertonicity** further decreases **blood flow**.



Schoutten and colleagues have shown increased anal pressures correlated with **decreased mucosal blood flow as measured by LASER flowmetry**. This **vascular - anal resting pressure hypothesis** has prompted trials aimed at **improving blood flow and lowering anal resting pressures**.

CLINICAL FEATURES

- i) The principal clinical feature is **intense anal pain during defecation**, often associated with a **small amount of bright red bleeding**.
- ii) **Perianal swelling from skin tag**.

- iii) **Mucous discharge.**
- iv) **Sensation of tearing during defecation.**
- v) **Dull ache in perineum 3-4 hours after bowel evacuation.**

It is **exacerbated** by a **recent episode of constipation and straining** or as a **complication of a severe diarrhea.**

DIAGNOSIS

The diagnosis can usually be achieved by **inspection**. **Gentle parting of the buttocks** reveals an **edematous skin tag** and a **shallow anal ulcer usually situated posterior in men or rarely anteriorly in women**. **Puckering of perianal skin** as a result of intense spasm of anal sphincters.

Digital examination is often **impossible** and should not be attempted in patients with severe pain, because the diagnosis can often be made by inspection.

Fissure has **edematous margins** and is **boat shaped** with the **transverse fibres of the internal sphincter seen at the base of the fissure.**

Manometry and digital rectal examination demonstrate **increased internal sphincter activity and hypertrophy of distal third of internal anal sphincter.**

If **anal manometry** is done, **elevation of resting anal pressure** with **saw tooth deformity** demonstrating contraction of sphincter muscle is **pathognomonic.**

Motility studies reveal **ultraslow waves** indicative of increased internal sphincter activity.

Sigmoidoscopy to exclude a **primary cause**, to exclude any **rectal pathology** should be performed in **patients who can tolerate a rectal examination.**

TREATMENT OUTLINE

Reducing the anal canal pressure medically or by dividing a portion of the internal sphincter increases the anal canal blood flow and promotes healing of the anal fissure.

Medical therapy of anal fissures should almost always precede surgical therapy. Stool bulking agents such as psyllium seeds or methyl cellulose in quantities sufficient to provide bulky soft stools reliably are the mainstay of medical therapy. Stool softeners and other laxatives should be avoided as the resultant stool is so soft it does not dilate the anal canal.

Dilute nitroglycerine 0.2% ointment applied to the anus before and after bowel movements has been advocated as an adjunct to bulking agents to decrease pain and to promote healing.

Persistence of painful anal fissures for 6 weeks or more on good medical therapy or development of complication such as infection constitute an indication for surgical therapy.

HEAT / SITZ BATH

The mechanism by which heat relieves discomfort is perhaps by **lowering anal canal pressures**. Nevertheless, heat provides dramatic relief to most patients with acute and chronic fissures. **It should be used in all patients.**

TOPICAL NITROGLYCERINE

Organic nitrates are rapidly denitrated enzymatically in the smooth muscle to release **free radical nitric oxide (NO)** which activates **cytosolic guanylyl cyclase → increased cGMP → Dephosphorylation of myosin light chain kinase (MLCK) through a cGMP dependant protein kinase.**

Reduced availability of phosphorylated / active MLCK interferes with actin to cause contraction. Consequently relaxation occurs. Raised intracellular cGMP may also reduce Ca^{2+} entry – contributing to relaxation.

Side Effects:

Headache (relieved by simple analgesics) **Tachyphylaxis** which can be reduced by instructing the patients to rest lying down while applying the ointment.

OTHER TOPICAL AGENTS

Both oral and topical Diltiazem have also been used to heal fissures and may have fewer side effects than topical nitrates.

Newer agents such as an **arginine (a nitric oxide donor)** and **topical Bethanecol (a muscarinic agonist)** have also been tried to treat fissures.

BOTULNUM TOXIN

It causes **temporary muscular paralysis** by **preventing acetyl choline release from presynaptic nerve terminals**. Injection of Botulinum toxin has been proposed as **an alternative to surgical sphincterotomy** for chronic fissure. Although there is a limited experience with this approach, results appear to be superior to other medical therapy and complications such as incontinence are rare. However **healing is slower** than after sphincterotomy and recurrence may be more common.

20 units of type A Botulinum toxin diluted to 50 units / ml is injected b/l into the fissure. It is well tolerated and can be administered on an outpatient basis. The healing rate reported is about 79%.

Drawback is the toxicity of the drug

Accidental injection into surrounding tissues amounting to general poisoning, hemotona and infection reported had discouraged regular use of this therapy.

BOTULINUM TOXIN INJECTION



CARBON DI-OXIDE LASER SURGERY

It involves laser vaporization of the fissure locally. The internal sphincter can be incised using this LASER. In long standing fissures, there is some degree of anal stenosis. It can be used to give relieving incisions in the three quadrants other than the fissure before the fissure is attended.

SURGERIES FOR ANAL FISSURE

OPERATIVE STRATEGY

Accurate identification of the lower border of the internal sphincter is essential to successful completion of an internal spincterotomy.

A bivalve speculum is inserted into the anal canal (**eg. Park's retractor**) and is opened for a distance of about 2 finger breadths to place the internal sphincter on stretch.

A distinct groove between subcutaneous external sphincter and lower borders of the internal sphincter is felt.

PREOPERATIVE PREPARATION:

Many patients with anal fissure cannot tolerate a preoperative enema because of excessive pain. Consequently, a **mild cathartic**, the night before the operation constitutes the only preoperative care necessary.

LATERAL INTERNAL SPHINCTEROTOMY:

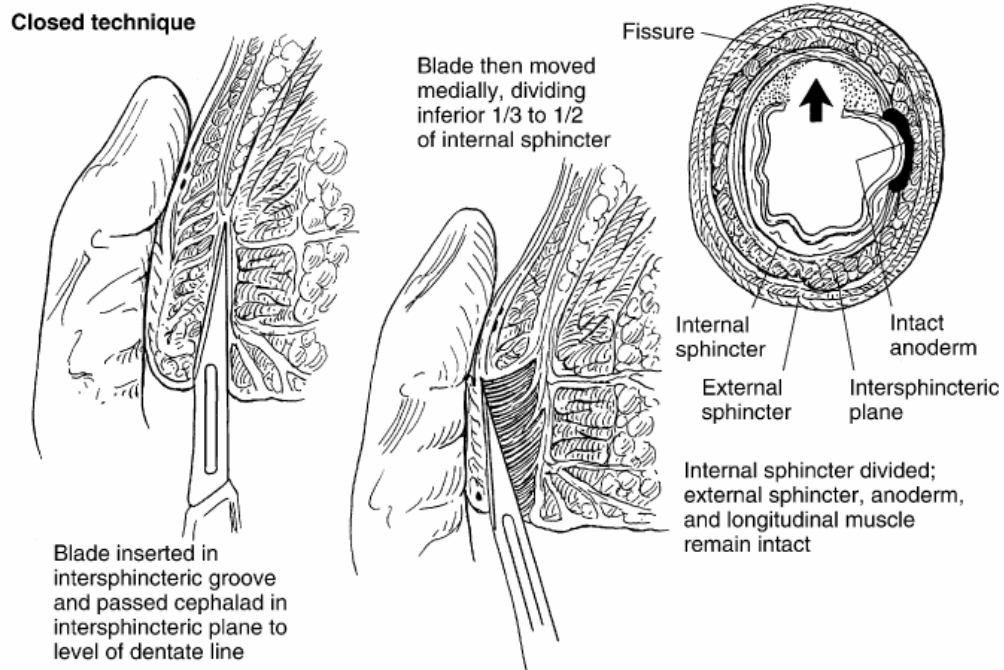
Two methods (i) Closed.

(ii) Open.

CLOSED SPHINCTEROTOMY

- Pt placed in **lithotomy position**.
- **Groove between the two sphincters** is felt by the method before mentioned.
- A **No.11 scalpel blade** is inserted in this groove keeping the flat portion parallel to internal sphincter up to the level of dentate line (1.5cm from anal verge). Then the **internal sphincter is transected with a gentle sawing motion**.
- There is a **gritty sensation** while it is being transected, followed by a **sudden 'give'**, where the blade has reached the mucosa adjacent to the surgeon's left index finger, inserted into the anal canal.

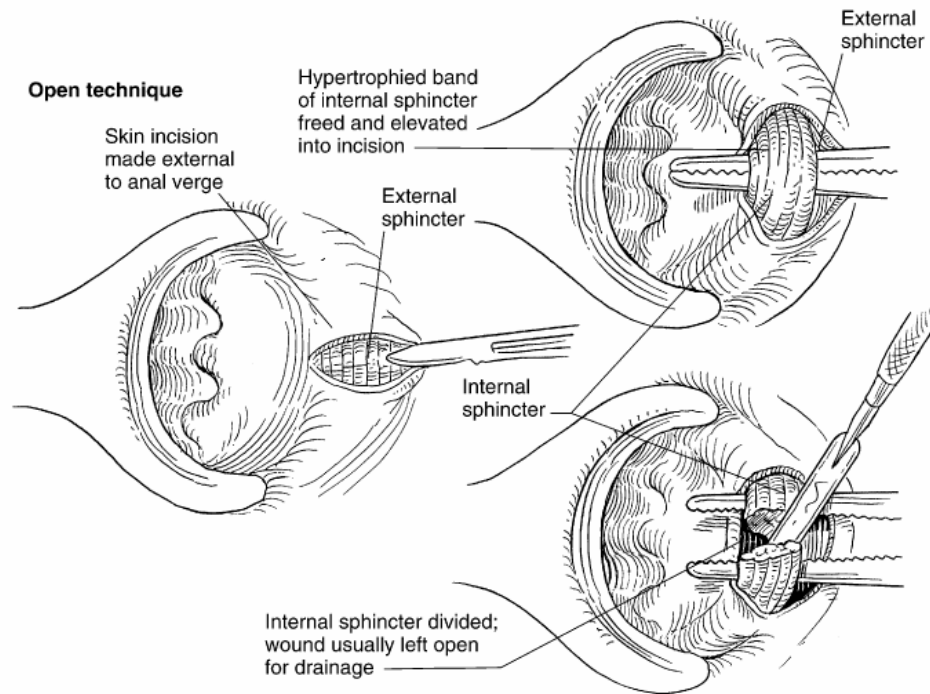
CLOSED INTERNAL SPHINCTEROTOMY



OPEN SPHICTEROTOMY

Radial incision is made in the **anoderm just distal to the dentate line** and is carried across the lower border of the internal sphincter in midlateral portion of the anus. Then the lower border of internal sphincter and the intersphincteric groove are identified. The **fibres of internal sphincter have a whitish hue**. The lower portion of internal sphincter is divided up to a point level with the dentate line. Hemostasis is achieved with a electrocautery. Dressing in applied.

OPEN INTERNAL SPHINCTEROTOMY



COMPLICATIONS

- **Hematoma / Bleeding (Rare).**
- **Perianal abscess (Rare).**
- **Flatus and fecal soiling.**
- **Flatus incontinence (temporary).**

ANAL DILATATION:

- Pt anesthetized in **left lateral position.**

- A **gentle dilatation** is undertaken **initially using two fingers** and **slowly stretching the anal canal to accomodate four fingers.**
- A **circumferential movement** is required, so that dilatation is directed to all parts of the internal sphincter muscle.
- This procedure should be performed for **2 to 3 minutes.**
- **Forceful dilatation should be avoided.** This is an **uncontrolled disruption** that is associated with a **higher recurrence rate** and **incontinence** and **hence is discouraged.**

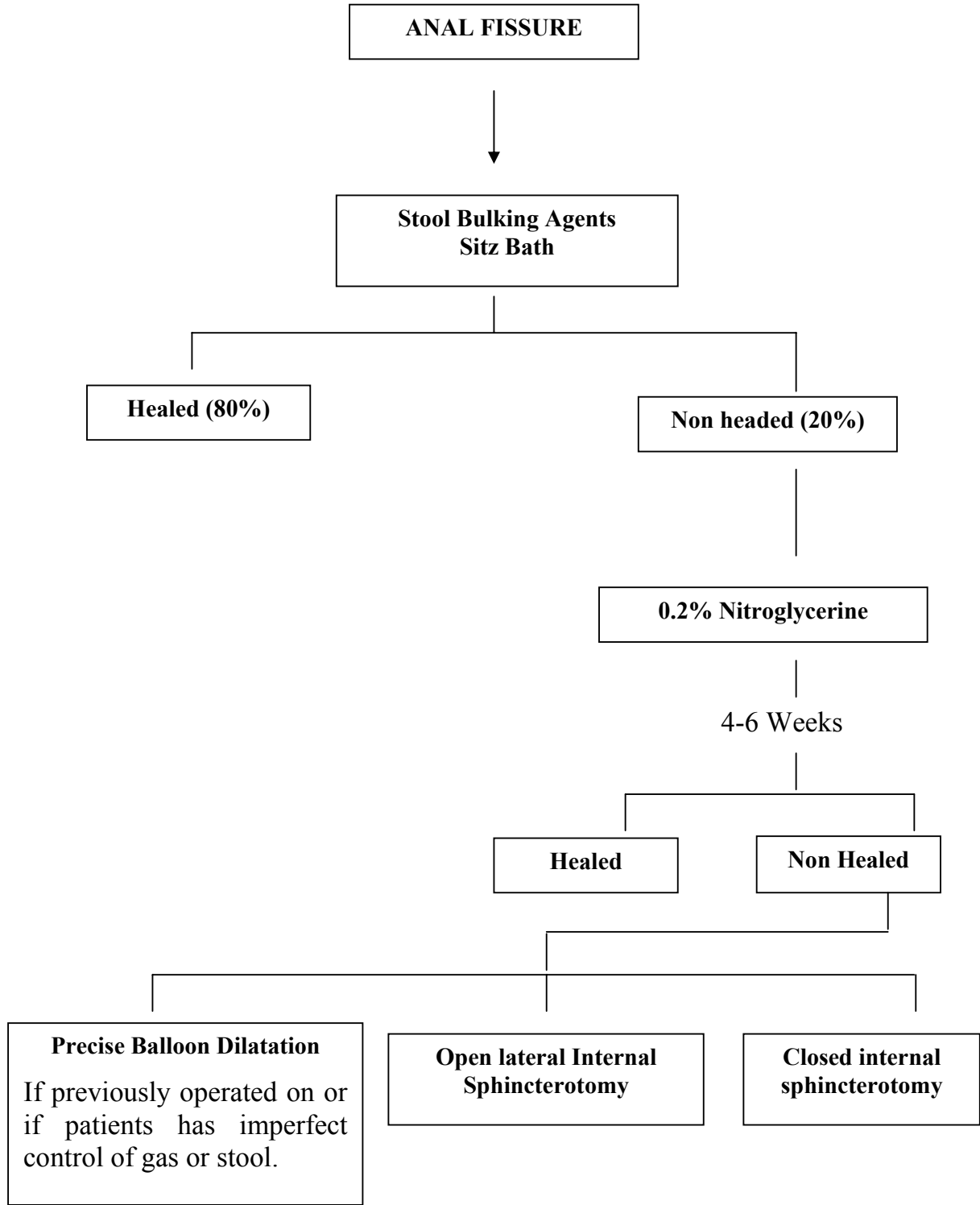
ANORECTAL ADVANCEMENT FLAP:

It is **particularly attractive for patients with low anal pressures,** that is those who have **failed previous sphincterotomy, despite a postoperative lowering of anal pressure** and for those with **severe anal stenosis.**

BALLOON DILATATION

Sohn and colleagues have reported that **controlled, precise dilatation of the anal canal using a balloon tipped dilating catheter** is as **efficacious as lateral internal sphincterotomy** but **lacks the typical complications associated with this operation**. Although **controversial and not prospectively studied**, balloon dilatation for patients for whom stool bucking agents, heat and nitroglycerine fail may be indicated before a lateral anal sphincterotomy is performed, especially in patients who may have **sphincter mechanisms at risk of fecal incontinence**.

The most practical and safest approach to the treatment of patients with anal fissure is depicted in the algorithm.



MATERIALS AND METHODS

SETTING

Study was a **prospective comparative study** done in **Government Kilpauk Medical College Hospital** from **June 2005 to October 2007**. **The Study Population was divided into two groups**. The Patients were of **age group 10-60 years**. **100 cases** were studied.

STUDY POPULATION

The study population was divided into two groups of 50 patients each.

One study group was treated with **topical application of 0.2% Glyceryl trinitrate along with sitz bath**.

Oral antibiotics such as Cap Amoxicillin 500 mg BD and Tab. Metronidazole 400 mg TDS for the first 1 week along with **topical 0.2% Glyceryl trinitrate application** about the size of a pea, over the anal verge **thrice daily for a period of 4 weeks** and observed.

Another study group was **admitted in the ward** and taken up for **lateral anal sphincterotomy** under antibiotic cover and a preoperative plain water enema.

The results were analyzed and published.

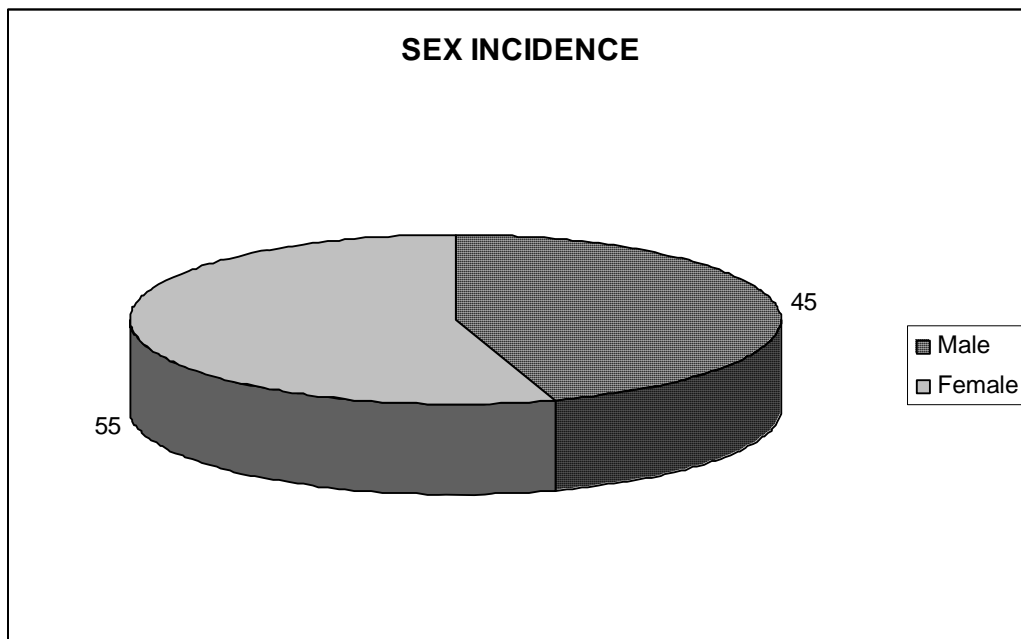
OBSERVATION AND ANALYSIS

SEX INCIDENCE

The incidence of fissure is **slightly higher in females than males.**

Out of the 100 cases studied, 55 patients were females and 45 patients were males.

Thus the **sex incidence ratio** in this study is **1.2:1 in favour of females.**



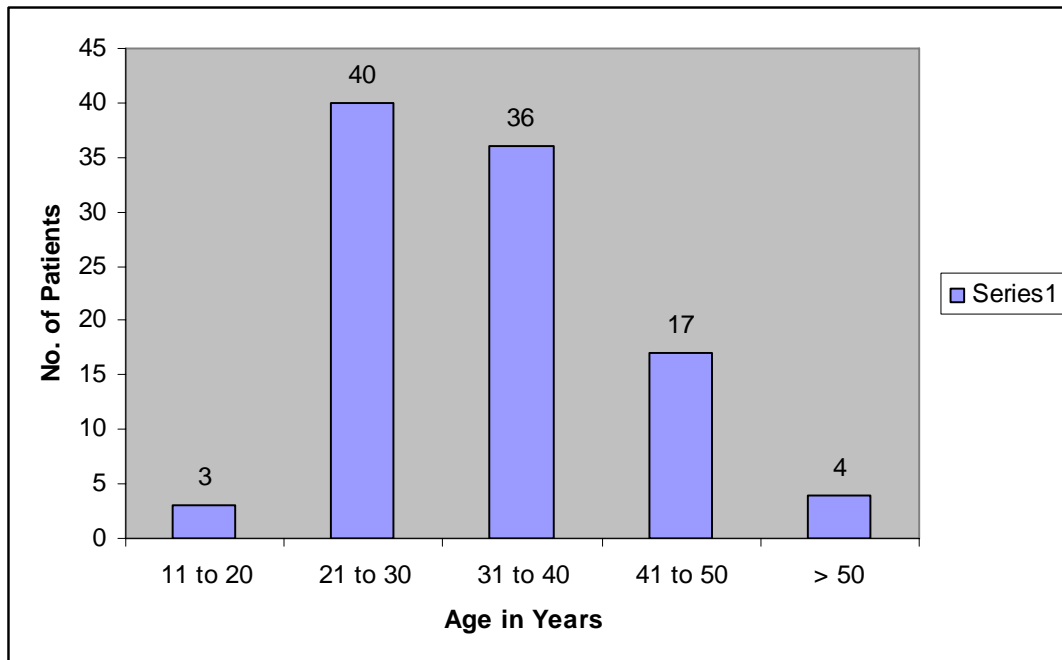
AGE INCIDENCE

The occurrence of fissure in ano in various age groups in my study are as follows.

Age Group	Patients
11 – 20 Yrs	3
21 – 30 Yrs	40
31 – 40 Yrs	36
41 – 50 Yrs	17
> 50 Yrs	4

Thus the fissure is more in **3rd decade** (i.e.,) **young adults** in my study.

AGE INCIDENCE



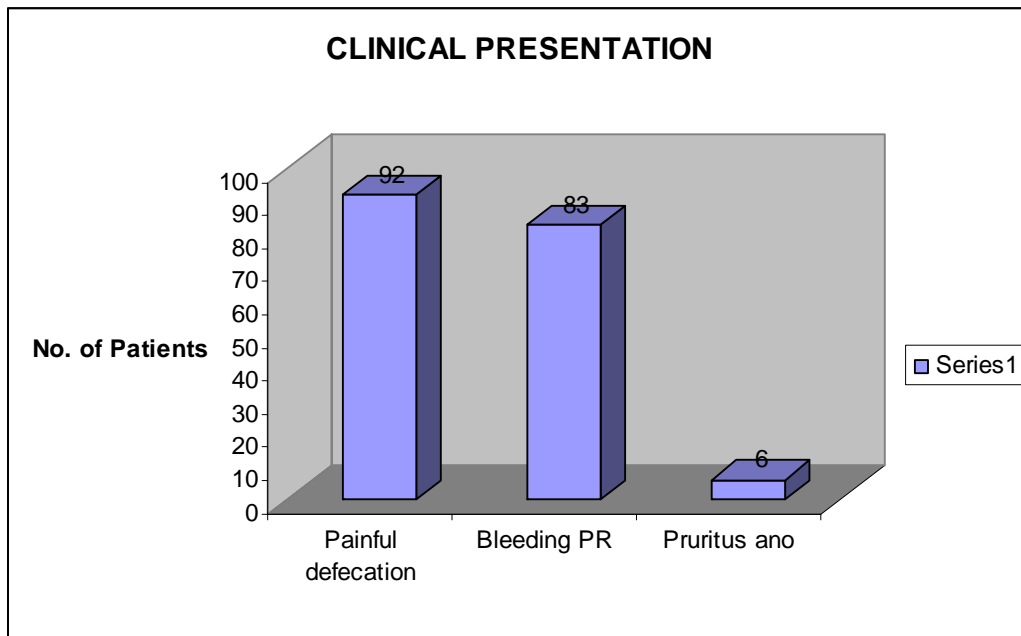
CLINICAL PRESENTATION

The **most common** clinical presentation is **painful defecation** occurring in **92 of 100 patients**.

The other presentations are:

→ **Bleeding PR** - **83 patients**

→ **Pruritus ano** - **6 patients**



TYPES OF FISSURE

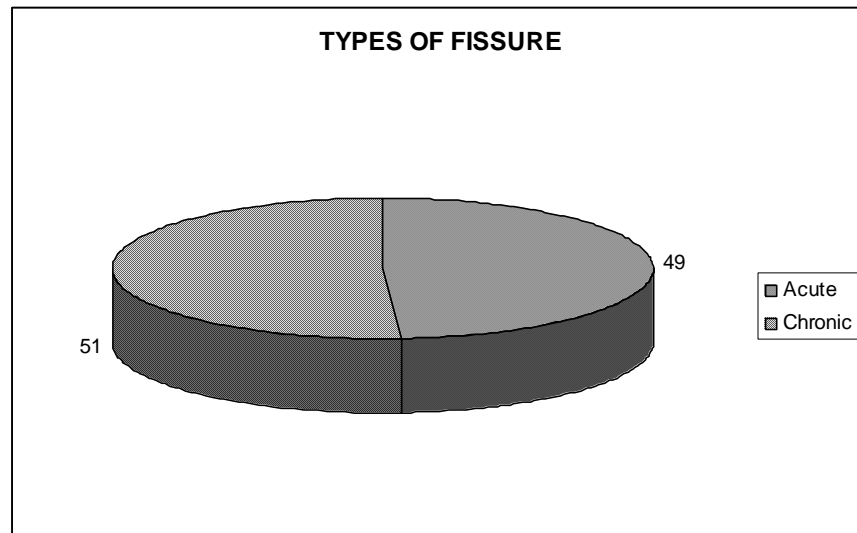
Incidence of various type of fissure is as follows:

→ Acute fissure - 49 patients.

→ Chronic fissure - 51 patients.

N.B. Acute fissure is a simple laceration of anoderm whereas chronic fissure in characterized by **these three features:**

- i) **Visibility of transverse internal sphincter fibres at the base of the ulcer**
- ii) **Sentinel skin tag and**
- iii) **Hypertrophied anal papilla**

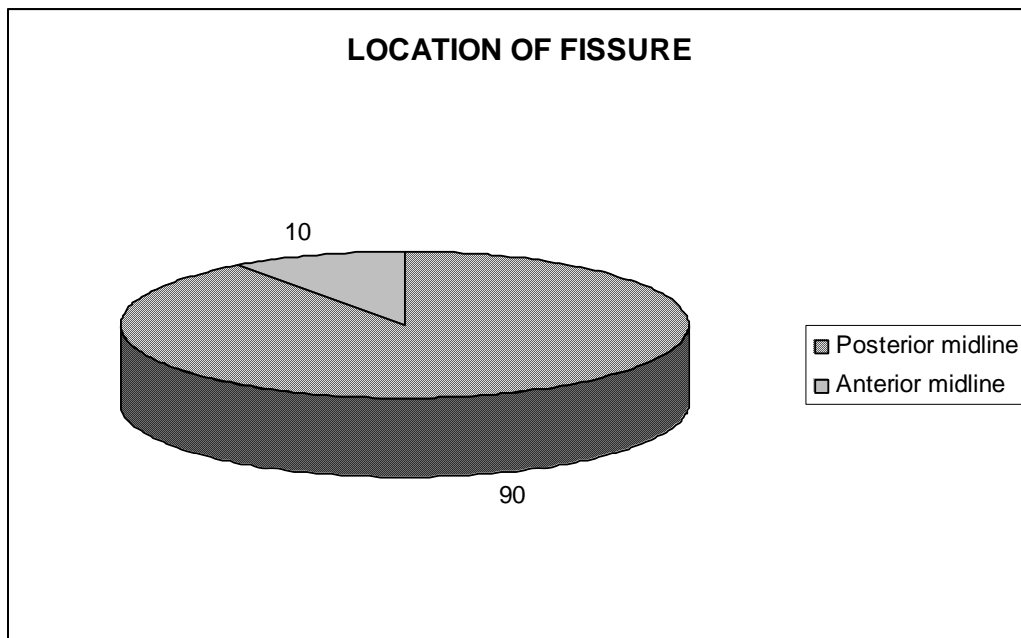


LOCATION OF FISSURE IN ANO:

The **most common location** of fissure in ano is the **posterior
midline**.

90 out of 100 patients showed **fissure in the posterior midline**.

Only 10 patients had **anterior midline fissures**. Of these, all
patients were females.



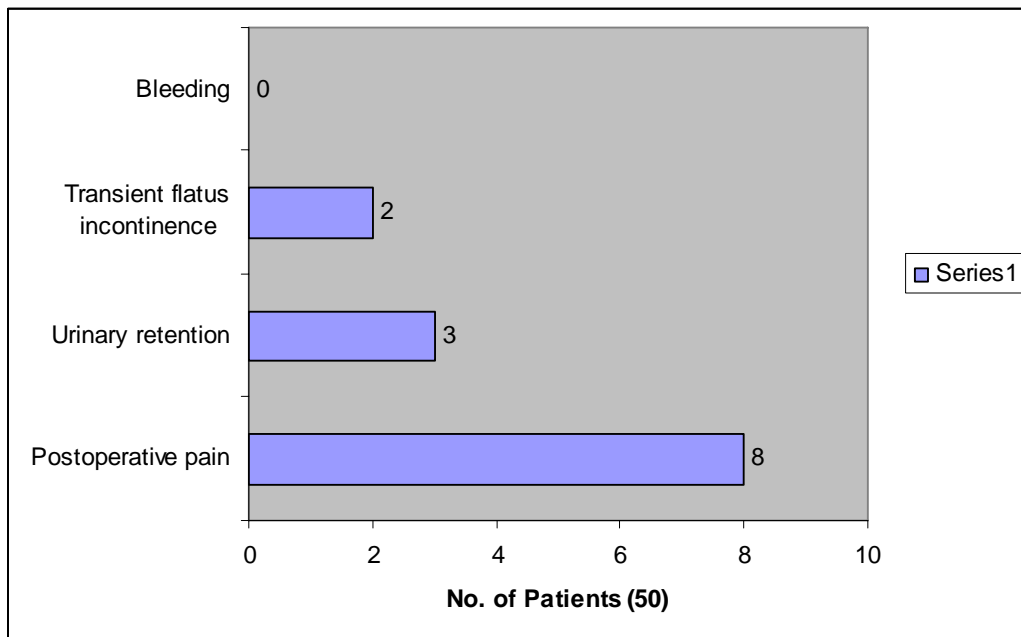
EFFECTIVENESS OF SURGICAL SPHINCTEROTOMY:

Lateral anal sphincterotomy either by closed or open method, relieved almost all the patients. 50 patients who were subjected to this method demonstrated healing of fissures.

Regarding **postoperative complications,**

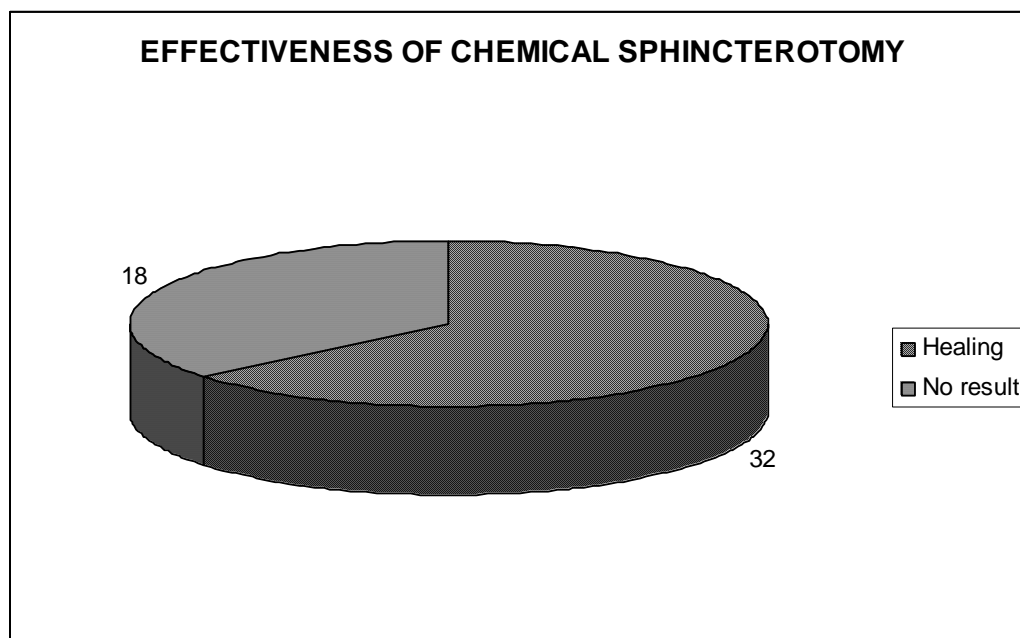
- (i) 8 out of 50 patients had postoperative pain** relived by analgesics **(i.e.,) 16%.**
- (ii) Urinary retention** was present in **3 patients (i.e.,) 6%.**
- (iii) Transient flatus incontinence in 2 patients (i.e.,) 4%.**
- (iv) Bleeding was not noted in any patient.**

POSTOPERATIVE COMPLICATIONS



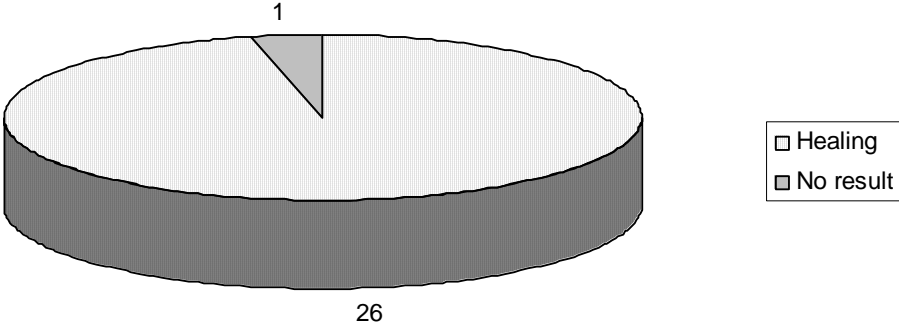
EFFECTIVENESS OF CHEMICAL SPHINCTEROTOMY

Out of 50 patients (27 patients – acute, 23 patients – chronic) who under went **chemical sphincterotomy** with **topical application of 0.2% glyceryl trinitrate** thrice daily for four weeks along with high fibre diet, sitz bath, oral one week antibiotic course, **32 patients showed symptomatic relief and healing.**



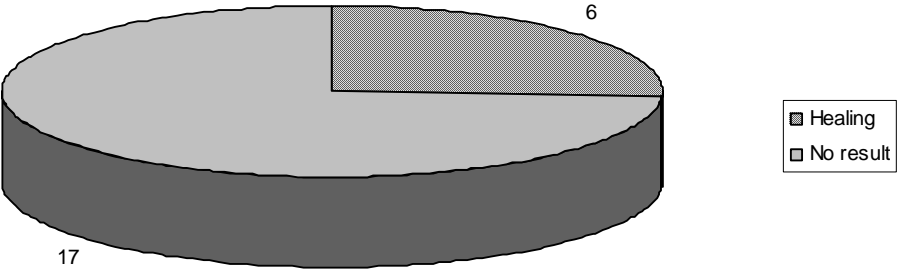
Out of 27 patients with acute fissure, 26 patients showed healing

EFFECTIVENESS OF CHEMICAL SPHINCTEROTOMY IN ACUTE FISSURE



Out of 23 chronic fissure patients, only 6 patients showed healing

EFFECTIVENESS OF CHEMICAL SPHINCTEROTOMY IN CHRONIC FISSURE



SIDE EFFECTS OF CHEMICAL SPHINCTEROTOMY

Most prominent side effect of topical 0.2% Glyceryl trinitrate application is **headache** (i.e) was present in **12 out of 50 patients (i.e) 24%** which was tolerable and relieved by simple analgesics.

CONCLUSION

1. The fissure in ano has a slight female preponderance.

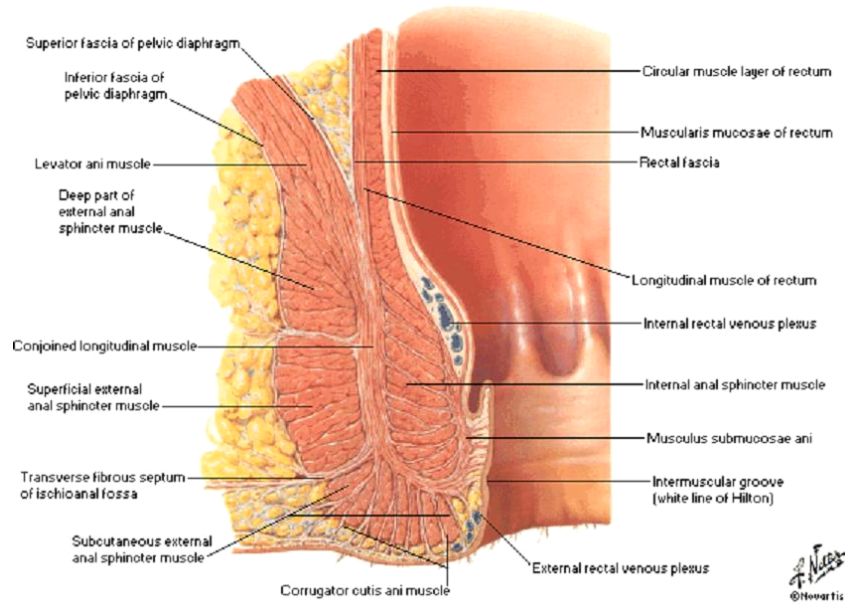
The sex incidence ratio is 1.2:1 in favour of females.

2. The fissure in ano occurs more commonly in 3rd decade (ie) young adults.
3. The most common clinical presentation of fissure in ano is painful defecation, which occurs in 92 out of 100 patients studied.
4. The incidence of both acute and chronic fissures were almost the same.
5. The most common location of fissure is posterior midline. 90 out of 100 patients showed fissure in the posterior midline. Only 10 patients had anterior midline fissure. Of these all were females.
6. Surgery in the form of open or closed lateral anal sphincterotomy forms the definitive treatment, healing fissure in almost all patients with very few postoperative complications.
7. Chemical sphincterotomy (ie) topical application of 0.2% Glycerol trinitrate healed 32 out of 50 patients (i.e) 64% efficacy rate.

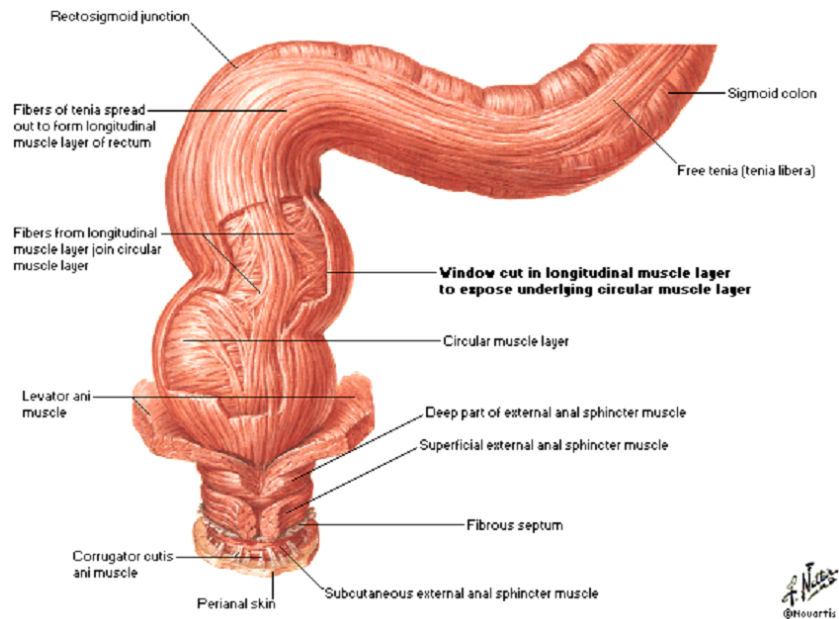
8. The most prominent side effect of topical application of 0.2% Glyceryl trinitrate, (ie) headache was present in 24% and was tolerable and relieved by simple analgesics.

9. Hence topical application of 0.2% Glyceryl trinitrate can be established as the first line treatment of acute and chronic and fissures.

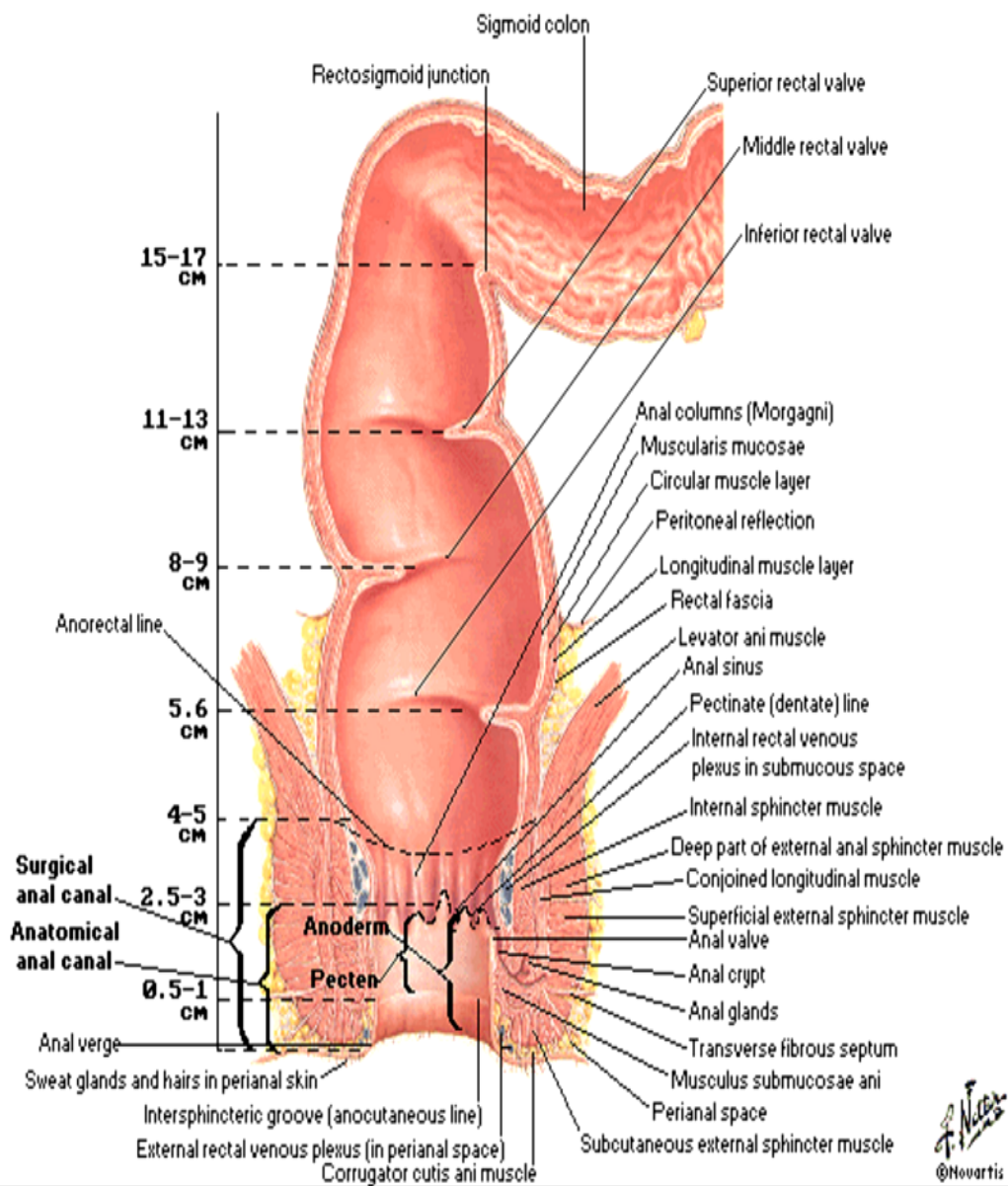
Anorectal Musculature Frontal Section



Anorectal Musculature Anterior View

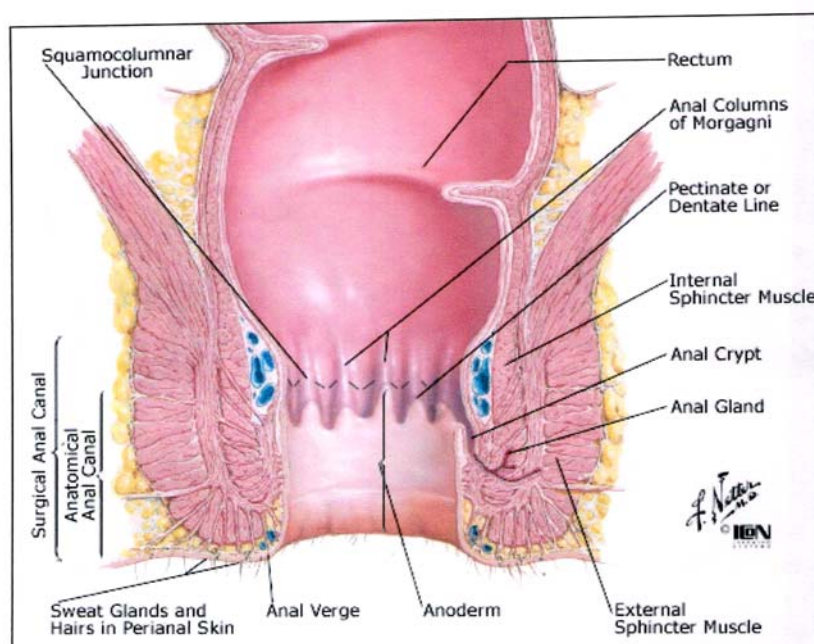
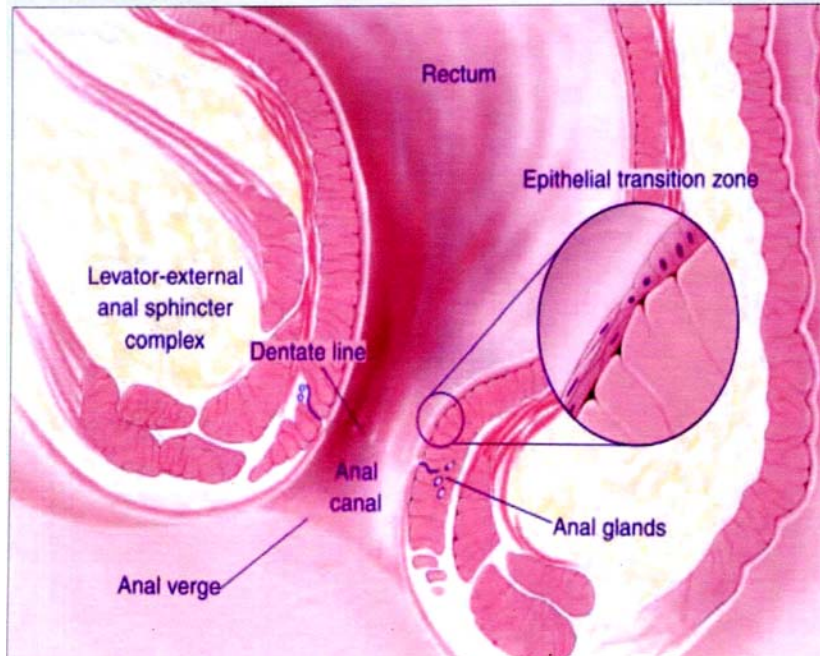


Rectum and Anal Canal

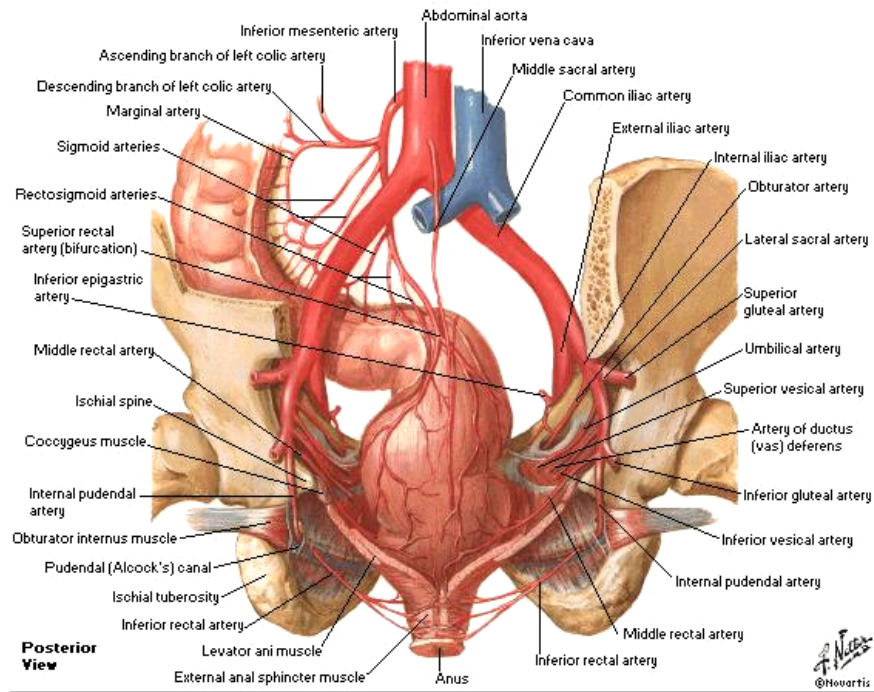


ANATOMY OF ANAL CANAL

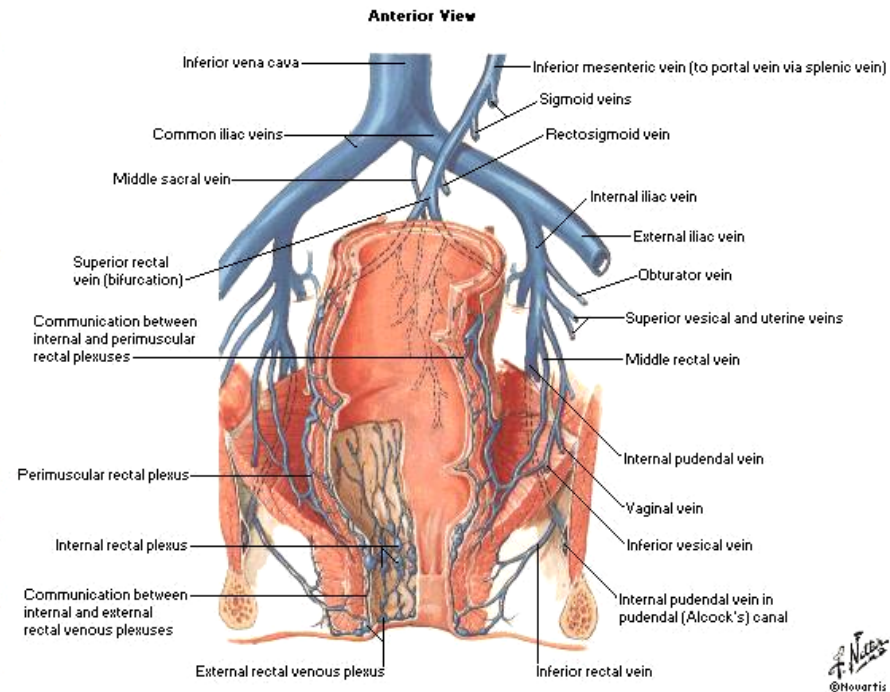
Anorectal anatomy



Arteries of Rectum and Anal Canal



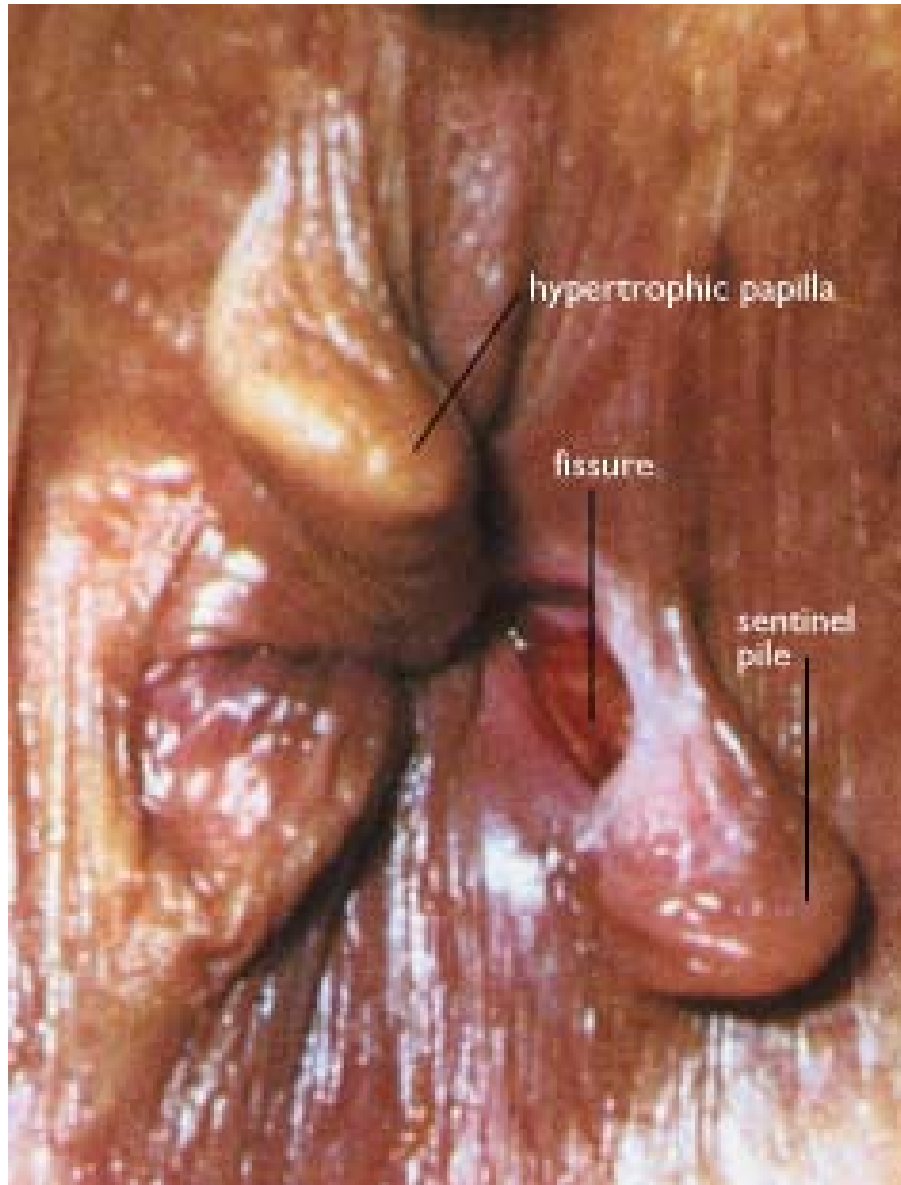
Veins of Rectum and Anal Canal



0.2% GLYCERYL TRINITRATE OINTMENT



CHRONIC FISSURE IN ANO



ACUTE FISSURE IN ANO



CHRONIC FISSURE IN ANO



TUBERCULOUS ANAL FISSURE



FISSURE IN ANO



ACUTE ANAL FISSURE



GROUP OF PATIENTS WHO HAVE UNDERGONE SURGICAL SPHINCTEROMY

Sl.No	Name	Age	Sex	Hos No.	Clinical Presentation			Types	Location	Complication				Result
					Pain	Bleeding	Pruritus	Acute	Anterior	Pain	Transient flatus incontinence	Urinary Retention		
								Chronic	Posterior					
1	Sathya	26	F	1619	+	+	-	Acute	Anterior	-	-	-	Healed	
2	Naina Mohammed	24	M	1734	+	+	-	Acute	Posterior	+	-	-	Healed	
3	Jayapradha	26	F	2576	+	+	-	Chronic	Posterior	-	-	-	Healed	
4	Nagaraj	25	M	2650	+	+	-	Chronic	Posterior	-	+	-	Healed	
5	Gopi	21	M	3123	+	+	-	Acute	Posterior	-	-	-	Healed	
6	Sulochana	40	F	3131	+	+	-	Chronic	Posterior	-	-	-	Healed	
7	Anguthai	50	F	3133	-	+	-	Chronic	Posterior	+	-	-	Healed	
8	Devarajan	46	M	3385	+	-	-	Chronic	Posterior	-	+	-	Healed	
9	Ravi	45	M	3230	+	+	-	Chronic	Posterior	-	-	-	Healed	
10	Amudha	35	F	4496	+	+	-	Acute	Posterior	+	-	-	Healed	
11	Vasantha	45	F	4468	+	+	-	Chronic	Posterior	-	-	-	Healed	
12	Saidanabee	21	F	4889	+	+	-	Acute	Posterior	+	-	-	Healed	
13	Jeeva	28	F	5865	+	-	-	Acute	Anterior	-	-	-	Healed	
14	Kowsalya	36	F	6178	+	+	-	Chronic	Posterior	-	-	-	Healed	
15	Sureshkumar	30	M	7090	-	+	-	Acute	Posterior	-	-	-	Healed	
16	Priyadharshini	21	F	7567	+	+	-	Acute	Posterior	-	-	-	Healed	
17	Thirugnanam	30	M	7672	+	-	-	Chronic	Posterior	-	-	-	Healed	
18	Rajesh	20	M	7842	+	+	-	Acute	Posterior	-	-	-	Healed	
19	Selvi	38	F	8121	+	+	-	Chronic	Posterior	-	-	-	Healed	
20	Bagyalakshmi	28	F	8546	+	+	-	Acute	Posterior	+	-	-	Healed	

Sl.No	Name	Age	Sex	Hos. No.	Clinical Presentation			Types	Location	Complication				Result
					Pain	Bleeding	Pruritus	Acute	Anterior	Pain	Transient flatus incontinence	Urinary Retention		
								Chronic	Posterior					
21	Shanthi	33	F	8583	+	+	-	Acute	Posterior	-	-	-	Healed	
22	Mathialagan	33	M	9039	-	+	-	Chronic	Posterior	+	-	-	Healed	
23	Mariyam	42	F	9624	+	+	-	Chronic	Posterior	-	-	-	Healed	
24	Anandhi	35	F	9686	+	-	-	Chronic	Posterior	-	-	-	Healed	
25	Murugadoss	33	M	9968	+	+	-	Acute	Posterior	-	-	-	Healed	
26	Arulmani	21	M	10603	+	+	-	Chronic	Posterior	-	-	-	Healed	

27	Peter	30	M	11007	+	-	-	Acute	Posterior	-	-	-	Healed
28	Meena	21	F	11760	+	+	-	Chronic	Posterior	-	-	-	Healed
29	Palanikumar	31	M	11786	+	-	-	Chronic	Anterior	+	-	-	Healed
30	Malliga	25	F	11821	++	+	-	Acute	Anterior	-	-	-	Healed
31	Vasanthi	44	F	12169	+	+	-	Chronic	Posterior	-	-	-	Healed
32	Shanthi	40	F	12628	+	+	-	Chronic	Posterior	-	-	-	Healed
33	Ramesh	25	M	13239	+	+	-	Acute	Posterior	-	-	-	Healed
34	Lakshmi	30	F	14155	+	+	-	Chronic	Anterior	-	-	-	Healed
35	Sundarathi	24	F	14175	+	+	-	Acute	Posterior	-	-	-	Healed
36	Govindaraj	43	M	15439	+	+	-	Chronic	Posterior	-	+	-	Healed
37	Ramesh	45	M	15499	+	+	-	Chronic	Posterior	-	-	-	Healed
38	Dhanam	35	F	19954	+	+	-	Acute	Posterior	-	-	-	Healed
39	Bagyalakshmi	22	F	20450	+	+	-	Chronic	Posterior	-	-	-	Healed
40	Vasanthi	25	F	20909	+	+	-	Acute	Posterior	-	-	-	Healed

Sl.No	Name	Age	Sex	Hos. No.	Clinical Presentation			Types	Location	Complication			Result
					Pain	Bleeding	Pruritus			Acute	Anterior	Pain	
								Chronic	Posterior				
41	Sudha	23	F	26370	+	+	-	Acute	Posterior	+	-	-	Healed
42	Kumari	40	F	26367	-	+	+	Chronic	Posterior	-	-	-	Healed
43	Ayyammal	55	F	26382	+	+	-	Chronic	Posterior	-	-	-	Healed
44	Mani	37	M	27666	+	-	-	Chronic	Posterior	-	-	-	Healed
45	Patchiyammal	36	F	28117	+	-	-	Chronic	Posterior	-	-	-	Healed
46	Sathish	26	M	34058	+	+	-	Acute	Posterior	-	-	-	Healed
47	Raja	25	M	36273	+	+	+	Acute	Posterior	-	-	-	Healed
48	Shahul Hameed	55	M	36721	+	+	-	Chronic	Posterior	-	-	-	Healed
49	Antony	23	M	37160	+	+	-	Acute	Posterior	-	-	-	Healed
50	Mani	38	M	37162	+	+	-	Chronic	Posterior	-	-	-	Healed

GROUP OF PATIENTS WHO HAVE UNDERGONE CHEMICAL SPHINCTEROTOMY

Sl.No	Name	Age	Sex	Hos. No.	Clinical Presentation			Types	Location	Result	Side Effects
					Pain	Bleeding	Pruritus	Acute	Anterior		
								Chronic	Posterior		
1	Sasikala	30	F	2192	+	+	-	Acute	Anterior	Healed	Headache
2	Malathi	38	F	2216	+	-	-	Chronic	Posterior	Healed	-
3	Amudha	42	F	2971	-	+	+	Acute	Posterior	-	Headache
4	Dillibabu	30	M	3935	+	+	-	Acute	Posterior	Healed	-
5	Gopal	37	M	4813	+	+	-	Acute	Posterior	Healed	-
6	Ragu	43	M	4793	+	+	-	Chronic	Posterior	Healed	-
7	Thulasiram	52	M	5294	+	+	-	Chronic	Posterior	-	-
8	Navaneetha Krishnan	38	M	7718	+	-	-	Acute	Posterior	Healed	Headache
9	Rao	31	M	9070	+	+	-	Acute	Posterior	Healed	Headache
10	Mary	33	F	9077	+	+	+	Chronic	Anterior	-	-
11	Jayanthi	32	F	9502	-	+	-	Acute	Posterior	Healed	-
12	Thayalnayagi	34	F	9602	+	+	-	Acute	Posterior	Healed	-
13	Sivakami	33	F	10163	+	+	-	Chronic	Posterior	-	-
14	Yasodha	40	F	10755	+	+	-	Chronic	Posterior	-	-
15	Latha	45	F	10795	+	-	-	Acute	Posterior	Healed	-
16	Raju	22	M	11369	+	+	-	Chronic	Posterior	Healed	-
17	Ravi	20	M	11631	+	+	-	Acute	Posterior	Healed	-
18	Thirumalai	24	M	11341	+	+	-	Acute	Posterior	Healed	-
19	Elila	37	F	11911	+	+	-	Chronic	Posterior	-	-
20	Dhinesh	40	M	11744	+	+	-	Chronic	Posterior	Healed	-

Sl.No	Name	Age	Sex	Hos. No.	Clinical Presentation			Types	Location	Result	Side Effects
					Pain	Bleeding	Pruritus	Acute	Anterior		
								Chronic	Posterior		
21	Anandhi	31	F	12786	+	+	-	Acute	Posterior	Healed	Headache
22	Babu	19	M	14698	-	+	-	Acute	Posterior	-	-
23	Maharani	31	F	16126	+	+	-	Acute	Posterior	Healed	-
24	Padma	38	F	17192	+	-	+	Chronic	Posterior	-	-
25	Ganapathy	25	M	18521	+	-	-	Acute	Posterior	Healed	Headache
26	Nagarani	32	F	18672	+	+	-	Chronic	Anterior	Healed	-

27	Sasikala	43	F	19350	+	+	-	Chronic	Anterior	-	Headache
28	Magalakshmi	28	F	20553	+	+	-	Acute	Posterior	Healed	-
29	Sulochana	30	F	21103	+	+	-	Chronic	Posterior	Healed	Headache
30	Logu	28	M	21906	+	-	-	Acute	Posterior	-	-
31	Radha	27	F	22250	+	+	-	Acute	Anterior	Healed	-
32	Shankar	36	M	21310	+	+	-	Chronic	Posterior	Healed	Headache
33	Renuga	32	F	22987	+	+	-	Acute	Posterior	Healed	-
34	Madina	23	F	23599	+	+	-	Chronic	Posterior	-	-
35	Dhanapal	42	M	23293	+	-	-	Chronic	Posterior	-	-
36	Bommi	45	F	24180	+	+	-	Chronic	Posterior	-	-
37	Murugan	28	M	24158	+	+	-	Acute	Posterior	Healed	-
38	Selvapathy	28	M	24495	+	+	-	Acute	Posterior	Healed	Headache
39	Hari	38	M	26558	+	+	-	Acute	Posterior	Healed	-
40	Javed	22	M	28238	+	-	+	Acute	Posterior	Healed	-

Sl.No	Name	Age	Sex	Hos. No.	Clinical Presentation			Types	Location	Result	Side Effects
					Pain	Bleeding	Pruritus				
								Chronic	Posterior		
41	Pichandi	47	M	28721	+	-	-	Chronic	Posterior	-	-
42	Selvi	37	F	23131	+	+	-	Chronic	Posterior	Healed	-
43	Lakshmi	33	F	24328	+	+	-	Acute	Anterior	Healed	-
44	Regan	22	M	30011	+	+	-	Chronic	Posterior	-	Headache
45	Dhavamani	37	F	31781	+	+	-	Acute	Posterior	Healed	-
46	Mary Pushpa	43	F	35980	+	+	-	Chronic	Posterior	-	-
47	Ananthi	48	F	35982	+	+	-	Chronic	Posterior	Healed	-
48	Seetha	34	F	41035	-	+	-	Acute	Anterior	Healed	-
49	Sasikumar	55	M	41433	+	+	-	Chronic	Posterior	-	-
50	Karthik	22	F	41647	+	-	-	Acute	Posterior	Healed	Headache

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