

**A PROSPECTIVE STUDY OF LIGATION OF
INTERSPHINCTERIC FISTULA TRACT (LIFT) FOR
FISTULA IN ANO IN GOVERNMENT RAJAJI
HOSPITAL, MADURAI**

**DISSERTATION SUBMITTED FOR
MASTER OF SURGERY
BRANCH - I (GENERAL SURGERY)**

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**THE TAMILNADU
DR.M.G.R. MEDICAL UNIVERSITY
CHENNAI**

BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled **A PROSPECTIVE STUDY OF LIGATION OF INTERSPHINCTERIC FISTULA TRACT (LIFT) FOR FISTULA IN ANO IN GOVERNMENT RAJAJI HOSPITAL, MADURAI** submitted by **Dr.KRISHNAMOORTHIA** to the Tamil Nadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of the requirement for the award of M.S. Degree Branch I (General Surgery) is a bonafide research work was carried out by him under my direct supervision & guidance.

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DECLARATION

I, **Dr.KRISHNAMOORTHIA** declare that, I carried out this work on, **A PROSPECTIVE STUDY OF INTERSPHINCTERIC FISTULAS TRACT(LIFT) FOR FISTULA IN ANO IN GOVERNMENT RAJAJI HOSPITAL, MADURAI.** At the Department of General Surgery, Govt. Rajaji Hospital during the period of 1 year. I also declare that this bonafide work or a part of this work was not submitted by me or any others for any award, degree, diploma to any other University, Board either in India or abroad. This is submitted to The Tamilnadu Dr.M.G.R. Medical University, Chennai in partial fulfillment of the rules and regulations for the M.S. degree examination in General Surgery.

Place: Madurai

Date:

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My patients, who form the most integral part of the work, were always kind and cooperative. I pray to God give them courage and strength to endure their illness, hope all of them go into complete remission.

Dr.KRISHNAMOORTHA

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INTRODUCTION

ANATOMY OF ANAL CANAL

The anal canal extends from the pelvic diaphragm upto the end at the anal verge. The muscular junction is felt with a finger inbetween the rectum and analcanal as a thickened edge, it is called as anorectal ring.

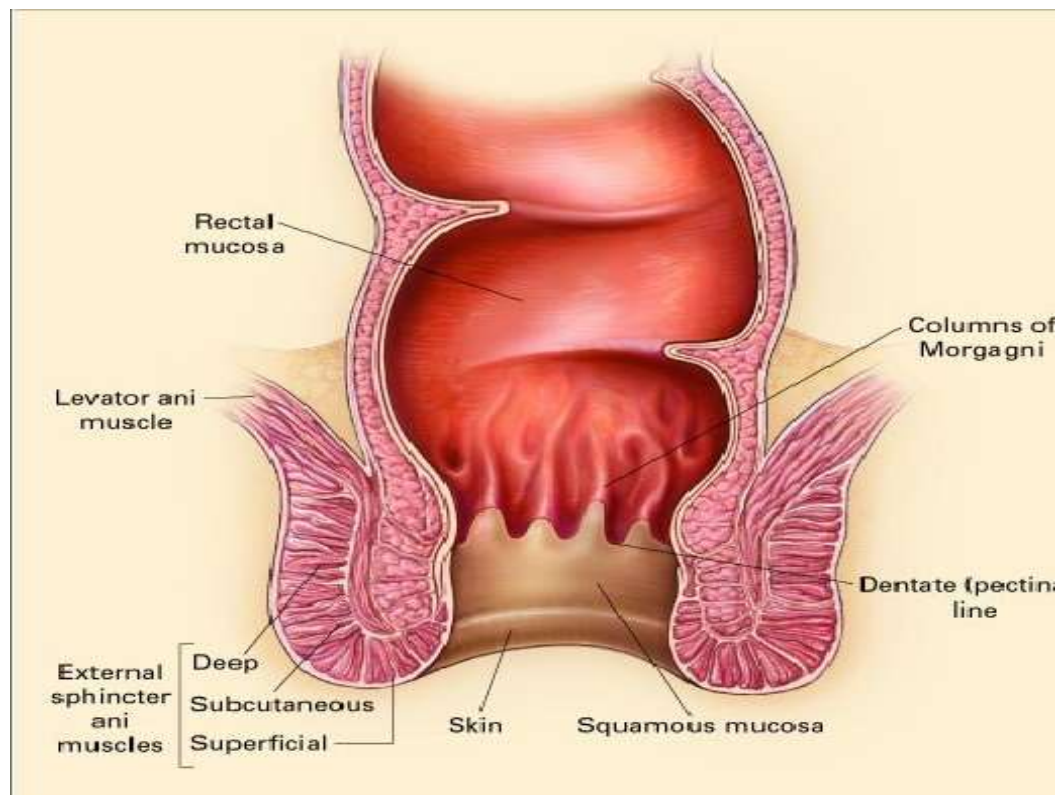
It is lies in the anal triangle of perinenumin between the right and left ischiorectal fossae, which allow its expansion during passage of the faeces. The sacculations and the taenia are absent here(as in rectum).The length of the anal canal is 3 – 4 cms.

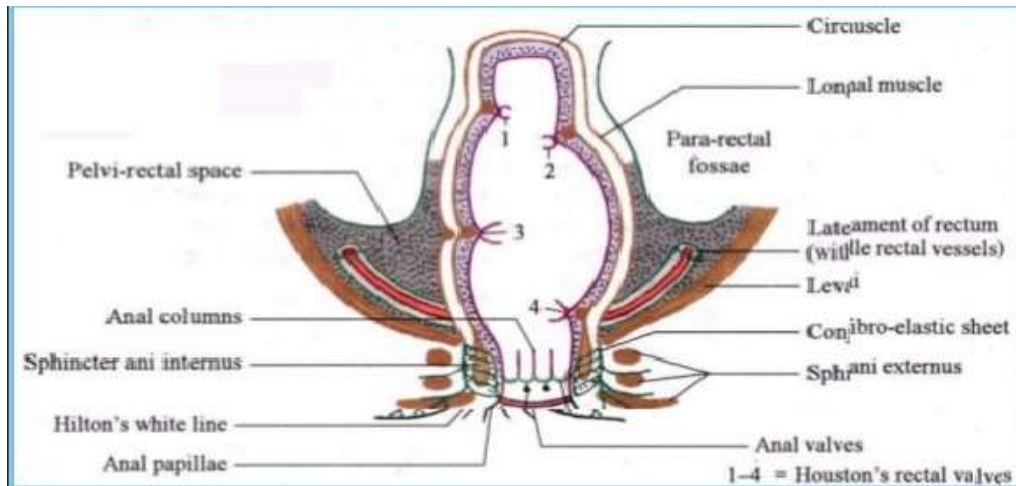
It is directed posteriorly because the sling-like puborectalis component of levatorani pulls the rectum forwards to create the anorectal angle. The anal canal lies 2–3 cm anterior and slightly inferior to the tip of the coccyx, and opposite the apex of the prostate in males.

At the anal verge, the squamous epithelium lining the lower anal canal becomes continuous with the skin of the perineum. The area of pigmentation of skin around the anal verge is corresponds approximately to the extent of the external anal sphincter. Identification of the anal verge may be difficult, particularly in males in whom the perineum may be

‘funnel’ upwards into the lower anal canal, but the characteristic puckering of the skin formed by the penetrating fibres of the conjoint longitudinal muscle of the anal canal, provides a useful landmark.

Anal canal has been divided into upper $2/3^{\text{rd}}$ and lower $1/3^{\text{rd}}$ by the Pectinate or Dentate line marked by the scalloping of the anal valves circumferentially. This represents the embryonic transition zone between the Proctodeum below and the Postallantoic Gut above. The upper part is lined by simple columnar epithelium is the Anal Mucosa region (Zona Columnaris) and this is insensitive to pain, supplied by autonomic plexus.

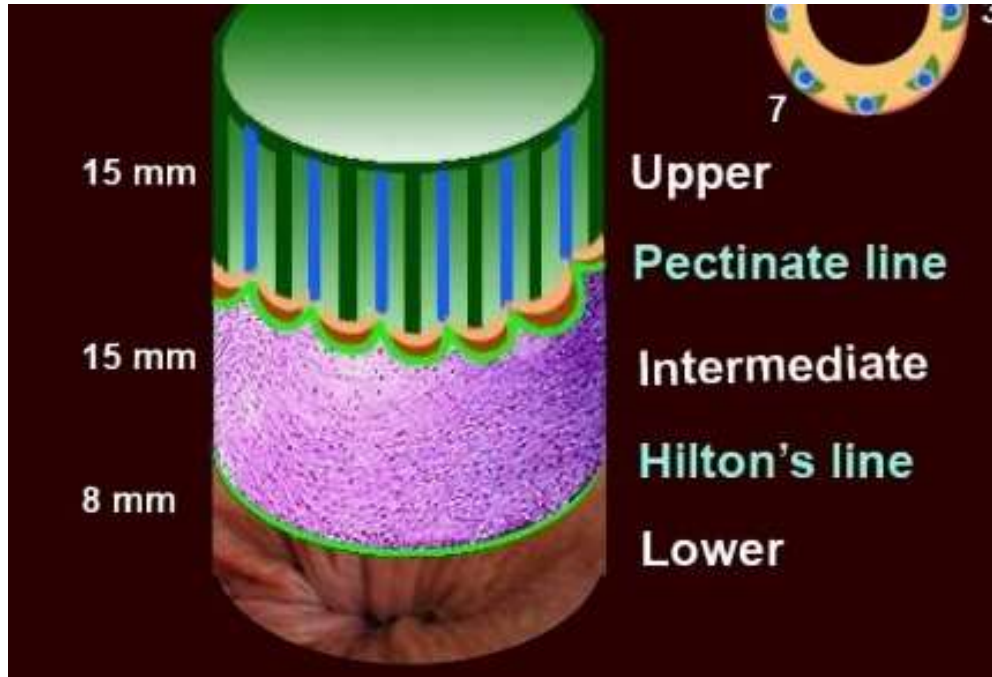




It contains the longitudinal folds of Anal columns with prominent ones at Left lateral, Right anterior and Posterior corresponding to 3, 7 & 11'o' clock positions forming the Anal cushions (common sites of internal haemorrhoids).

These columns are end in Anal valves above which the Anal glands open into the Anal crypts or Sinuses (foci of infection in Perianal Abscess). Now just below the Pectinate line for about 1-2cm is the Anal Pecten or Actual Transition zone (Zona Hemorrhagica) is lined by simple non keratinized squamous epithelium. Lower border is marked by the White line of Hilton, abroad water shed line. Below this the Anal canal lined by Keratinized Squamous epithelium lacking the Skin appendages, called as Anoderm (Zonacutanea). This region is rightly called Anoderm as it appears like skin, this is keratinized & it is pain sensitive and supplied

by the inferior rectal nerve, branch of Internal Pudendal Nerve. Anal fissures involve this part of the Anal canal.



The anal canal consists of an inner epithelial lining, a vascular subepithelium, the internal and external anal sphincters, and fibromuscular supporting tissue, as well as dense neuronal networks of autonomic and somatic in origin. Functionally, it represents the zone of high pressure. It is between 2 and 5 cm long in adults; the anterior wall is slightly shorter than posterior. This is usually shorter in females. At rest, it forms an oval or a triradiate slit in the antero posterior plane rather than a truly circular canal.

The arrangement of the external anal sphincter and its attachments to the perineal body and coccyx create sites of the maximum pressure in the anterior and posterior midline of the canal.

Anteriorly, the middle third of the anal canal is attached by the dense connective tissue to the perineal body, which separates it from the membranous urethra in the males and from the lower vagina in females.

Laterally and posteriorly, the anal canal is surrounded by a loose adipose tissue of the ischio-anal fossae; this arrangement allows the expansion of the canal but offers a potential pathway for the spread of perianal sepsis.

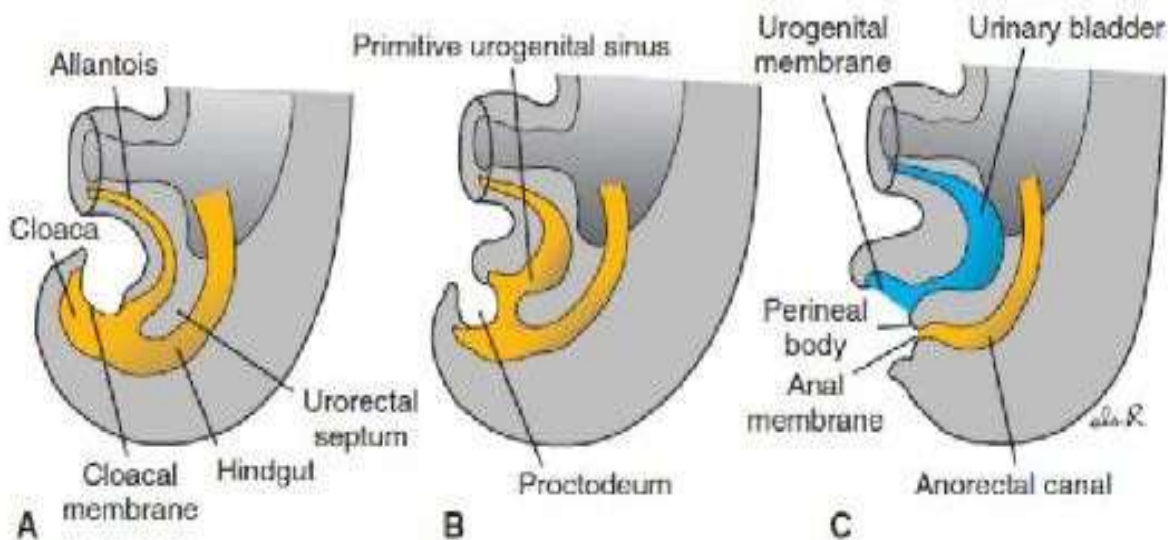
Posteriorly, the anal canal is attached to the coccyx via the anococcygeal ligament, a midline fibroelastic structure that runs between the posterior aspect of the, middle region of the external anal sphincter and the coccyx.

The anococcygeal ligament is, traditionally regarded as lying just inferior to the midline raphe of levatorani, but its relationship to the raphe is more complex. The ischial spines may be palpated laterally by an examining finger in the upper anal canal. The pudendal nerves pass over the attachment of the sacrospinous ligament at this point, and

pubudental nerve motor terminal latency may be measured digitally using the modified electrode worn on the examining glove.

Embryology

Hind gut opens into the posterior part of Cloaca forming the upper part of Anal canal and the Ectoderm of Proctodeum (Anal Membrane) invaginates forming the Anal pit, giving rise to the lower part of Anal Canal. Subsequent degeneration of the Anal membrane establishes the continuity of the passage.



Development of Anal Canal

BLOOD SUPPLY OF ANAL CANAL

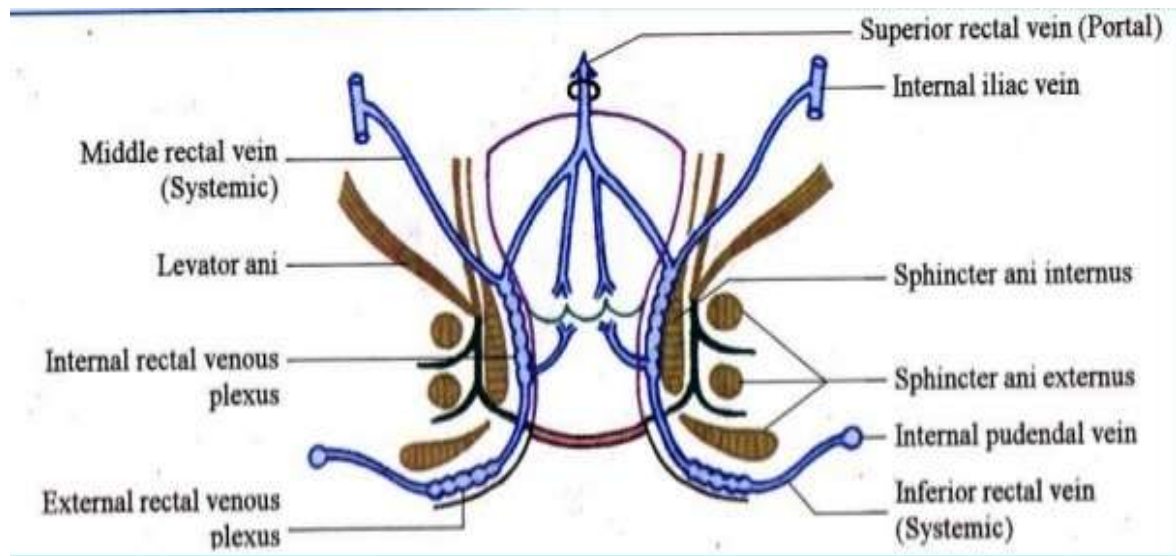
The arterial supply of the external and internal anal sphincters, as well as the mucosa over the lower half of the anal canal has derived from the right and left inferior rectal arteries. The mucosa proximal to the dentate line is however, supplied by terminal twigs of the superior rectal artery. The middle rectal arteries, they usually make an insignificant contribution. Within the wall of the anal canal, there is a rich anastomosis between the terminations of the inferior rectal and superior rectal arteries and, for what it is worth, the terminal twigs of the middle rectal arteries.

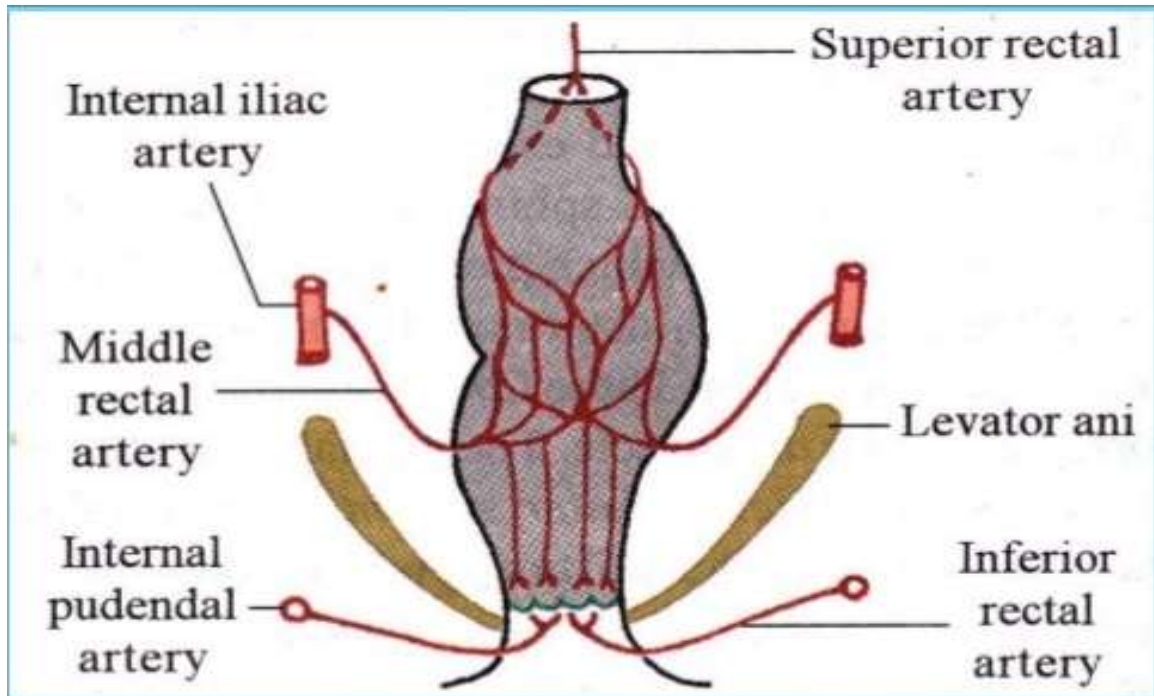
The veins draining the anal canal is correspond to the main arteries that supply the anal canal, and originate in the venous plexus situated in the anal wall. In effect this plexus is in series with, and continuous with the intramural rectal venous plexus. Venous channels from the upper part of the anal canal, (proximal to the dentate line) drain mainly into the superior rectal vein and thereby eventually to the portal venous system.

Distal to the dentate line, venous drainage is mainly to the internal iliac veins either directly via the middle rectal veins, or

indirectly via the inferior rectal veins and internal pudendal veins. As this has already been stated above, the upper half of the anal canal represents a site of natural porta-systemicanastomosis.

In addition to the intramural venous plexuses in the anal wall, and very possibly related to them, are arteriovenous mucosal cushions situated in the upper half of the anal canal. These cushions are thought to aid the internal and external anal sphincters in effecting tight closure of the anal canal. Additionally, the cushions make a modest contribution to the resting anal tone.





MUSCLES OF THE ANAL CANAL

The anal canal is surrounded by internal and external anal sphincters, separated by the conjoint longitudinal muscle layer, the whole arrangement being referred to as the anal sphincter complex.

INTERNAL ANAL SPHINCTER

The internal anal sphincter is the specialized, white and thickened terminal part of the inner circular muscle of the large intestine. This is thicker in males and in patients with chronic constipation. The muscle fibre arrangement is not truly circular, but rather a tight spiral that shortens

and widens with relaxation. It commences at the anorectal junction and ends above the anal verge.

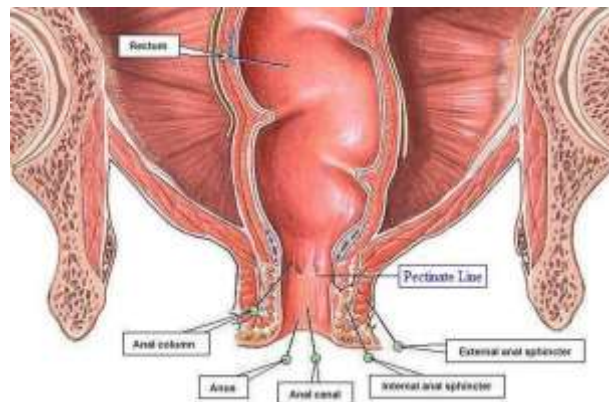
Its lower border is palpable at the intersphincteric groove, which corresponds to the proximal limit of the subcutaneous part of the external anal sphincter. It has Traversed by the fibres passing medially from the conjoint longitudinal muscle into the submucosa. At rest this is tonically contracted but it relaxes as a consequence of reflex activity predominantly during defecation. Transient relaxation of the upper internal anal sphincter occurs in response to the rectal distension (the recto-anal inhibitory reflex) and postprandial rectal contractions (the sampling reflex).

Relaxation allows the passage of distal rectal contents into the upper anal canal, enabling a conscious or subconscious perception of their physical nature; it is accompanied by sustained contraction of the distal internal anal sphincter and contraction of the external anal sphincter to maintain continence. The recto-anal inhibitory reflex is primarily mediated by the enteric nervous system, although spinal pathways may have a modulatory role. This is absent in patients with Hirschsprung's disease.

VASCULAR SUPPLY AND INNERVATIONS

The internal anal sphincter is supplied by terminal branches of the superior and inferior rectal vessels, and innervated extrinsically by autonomic nerves. Sympathetic fibres originate in the upper two lumbar spinal segments, and parasympathetic fibres originate in the second to fourth sacral spinal segments, both being distributed via the inferior hypogastric plexus.

Stimulation of cholinergic muscarinic receptors (parasympathetic) causes internal anal sphincter relaxation and longitudinal anal muscle contraction, while α adrenergic receptor stimulation (sympathetic) causes contraction of both the internal anal sphincter and longitudinal muscle. Activation of nitrergic nerves also mediates internal anal sphincter relaxation and is the rationale for using topical nitroglycerine and other drugs that promote nitric oxide release in the treatment of pathological conditions associated with increased resting anal tone.



CONJOINT LONGITUDINAL MUSCLE

The conjoint longitudinal muscle of the anal canal is a direct continuation of the outer longitudinal smooth muscle of the rectum, descending between internal and external anal sphincters, and augmented in its upper part by striated muscle fibres from the medial aspect of levatorani. The muscle is particularly prominent in the fetus, where it is actually thicker than the internal anal sphincter.

With advancing age, there is gradual replacement of muscle by connective tissue, such that the layer becomes thin in the elderly and few muscle fibres are seen in its distal part. As it passes down the anal canal, muscle fibres peel off in three directions: internally, through the internal anal sphincter to reach the anal submucosa; inferiorly, through the striated muscle of the lower subcutaneous part of the external anal sphincter to insert into the perianal skin (some of these fibres encircling the anal orifice); and outwards, through the upper part of the external anal sphincter. The lowermost fibres create a honeycomb arrangement in the subcutaneous fat and separate a superficial perianal space from the deeper ischio-anal fossa. Additional ramifications of this muscle beyond the external anal sphincter have been described, emphasizing its central role in anorectal stability.

The conjoint longitudinal muscle is innervated by autonomic nerves that share their origin with those supplying the internal anal sphincter its contraction during defecation shortens and widens the anal canal, and everts the anal orifice. Degeneration of the muscle and its gradual replacement by connective tissue occurs with age and is central to the development of haemorrhoids. Its extensions provide pathways for the spread and containment of infection.

EXTERNAL ANAL SPHINCTER

The external anal sphincter forms the bulk of the anal sphincter complex. It is an oval tube of striated muscle composed mostly of type I slow twitch muscle fibres adapted for prolonged contraction. The length and thickness of the external anal sphincter is less in females.

The historical concept of the muscle having three parts (deep, superficial and subcutaneous) is no longer valid, but upper (deep) and lower (superficial or subcutaneous) parts are described by some authors. The upper part surrounds the internal anal sphincter while the lowermost part encircles the anal canal inferior to the internal anal sphincter.

The upper part of the external anal sphincter is attaché anococcygea lligament posteriorly and to the perineal body anteriorly; some muscle

fibres on each side of the sphincter decussate to form a commissure in the anterior and posterior midline. The uppermost fibres blend with the lower medial fibres of puborectalis and attach to the anococcygeal raphe posteriorly and the transverse perineal muscles anteriorly. The lower part of the external anal sphincter extends below the internal anal sphincter and is traversed by the terminal fibres of the conjoint longitudinal muscle (see above). Anteriorly, it is attached to bulbospongiosus and bulbocavernosus. Like the levatorani and internal anal sphincter, the external anal sphincter is tonically contracted at rest (the postural reflex).

VASCULAR SUPPLY AND INNERVATIONS

The external anal sphincter is supplied by the inferior rectal vessels, with a small contribution from the median sacral artery. It is innervated bilaterally by the inferior rectal branch of the pudendal nerve (containing contributions from the second, third and fourth sacral spinal nerves). The pudendal nerve also carries afferent fibres from the lining of the anal canal and perianal skin. The upper external anal sphincter may also receive motor fibres from the nerve to levatorani (ventral rami of predominantly the third and fourth sacral spinal nerves).

INTERSPHINCTERIC SPACE AND ANAL GLANDS

The intersphincteric ‘space’ is a potential space between the conjoint longitudinal muscle layer and the external anal sphincter. It can be entered surgically to provide access in a variety of operations (e.g. intersphincteric excision of the rectum and intersphincteric approaches to fistulae). Within the space lie the intersphincteric anal glands, the source of most anal fistulae. There is an average of twelve intersphincteric anal glands within the adult anal canal, evenly distributed around the circumference.

Their function is unknown, but they secrete mucin (different in composition from that secreted by rectal mucosa) and they communicate with the anal lumen via ducts (lined by epithelium similar to that of the anal transition zone), which cross the internal anal sphincter to open at the level of the anal valves immediately above the dentate line. Retrograde passage of bacteria from the anal canal to the gland is understood to cause infection; inflammatory occlusion of the duct prevents spontaneous drainage back into the lumen of the anal canal.

VASCULAR SUPPLY AND LYMPHATIC DRAINAGE OF ANUS

ARTERIES

The anal canal is supplied by terminal branches of the superior rectal artery and the inferior rectal branch of the internal pudendal artery, together with a small contribution from the median sacral artery. The arterial supply to the epithelium of the lower anal canal in the midline, particularly posteriorly, is relatively deficient; this is further diminished if the internal anal sphincter is hypertonic.

The epithelium is more firmly tethered to underlying structures in the midline, which may also be a focal point of pressure in the anal canal. Collectively, these factors are thought to predispose to the occurrence of acute and chronic anal fissures, which are most commonly found in the midline, especially posteriorly.

VEINS

The venous drainage of the anal canal parallels the arterial supply. The upper canal is drained predominantly by the superior rectal veins, tributaries of the inferior mesenteric vein and the portomesenteric venous system; some blood returns to the internal iliac veins via the middle rectal veins. The lower part of the anal canal, including the external

haemorrhoidal venous plexus drains via the inferior rectal branches of the internal pudendal vein into the internal iliac vein.

LEVATOR ANI

The levatorani is the major component of pelvic floor also known as pelvic diaphragm. It is a pair of broad symmetrical sheets composed of three striated muscles iliococcygeus, pubococcygeus, and puborectalis.

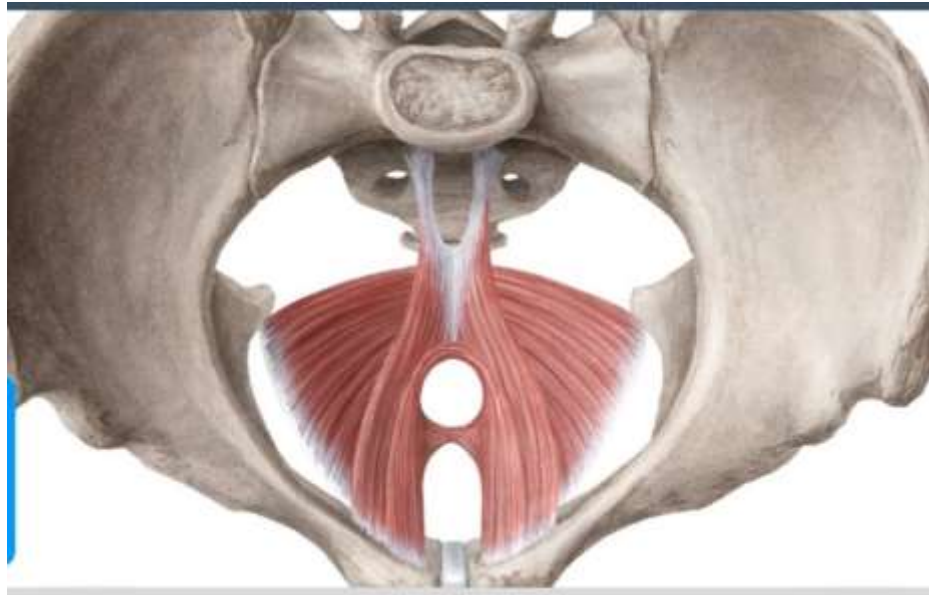
A variable fourth component the ischiococcygeus or coccygeus is in humans represented by a few muscle fibres on the surface of sacrospinous ligament Iliococcygeus fibres arise from ischial spine and posterior part of obturator fascia course inferiorly and medially to insert into the lateral aspects of S3 and S4, the coccyx and into the anococcygeal raphe.

The pubococcygeus arises from the posterior aspect of the pubis anterior part of obturator fascia, runs dorsally alongside the anorectal junction and decussates with the fibres of opposite side at the anococcygeal raphe. It inserts into the anterior surface of fourth sacral and first coccygeal segments.

Puborectalis is a U shaped strong loop of striated muscle which slings the anorectum junction back to pubis. The puborectalis is the most

medial portion of the levator muscle and it is situated immediately cephalad to deep component of external sphincter.

The anorectal angle is the result of anatomical configuration of U-shaped sling of puborectalis around anorectal junction is thought to maintain gross fecal continence. The pelvic floor is defective in the midline where the lower rectum, urethra and either dorsal vein of penis in men and vagina in women pass through it. This defect is called the levator hiatus and resides in an elliptical space situated between the pubococcygeus muscle.



ANORECTAL LANDMARKS

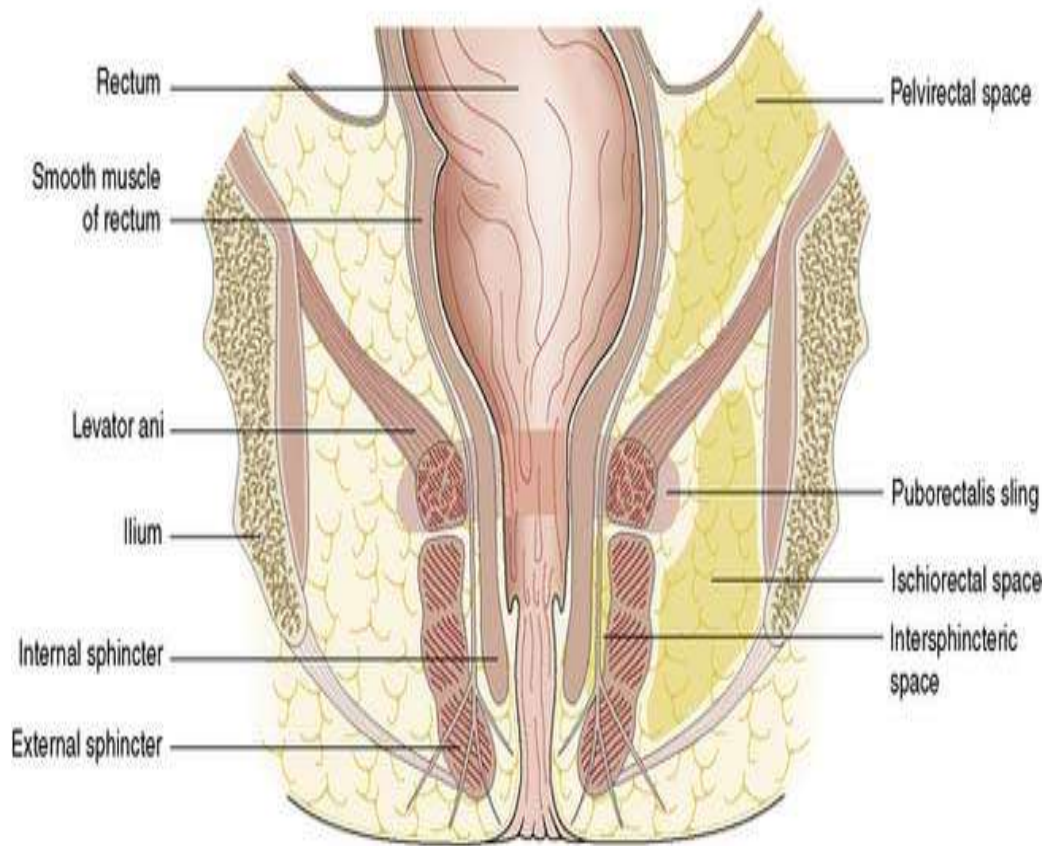
- The anal verge the lowermost point of the anus is generally the level of reference for measurements taken during colonoscopy.
- The coccyx the sacrospinous ligament the ischialtuberosities, palpated during rectal examination , are landmarks for procedures involving pudendal nerve.
- The lower rounded edge of internal anal sphincter can be felt on physical examination, approximately 1.2 cm distal to the dentate line.
- The intersphincteric sulcus is the groove between the IAS and EAS, can be visualised or easily palpated and is used as a parameter for sphincterotomy.
- The anorectalring, the upper end of sphincter or more precisely the puborectalis, and the upper border of IAS is an easily recognized boundary of the anal canal on physical examination.

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 ischioirectalspace .
3. The ischioirectal space or fossa is 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 ischioirectal spaces are common sites of abscesses.



AIMS OF STUDY

The aim of this study was to assess the sphincter saving procedure, LIFT (LIGATION OF INTERSPHINCTERIC FISTULAS TRACT) in fistula in ano patients, compared with conventional fistulectomy, in a tertiary care set up.

In view of the large number of Fistula in ano patients being treated in this hospital, has been considered worthwhile due to the cost effectiveness and infrastructure available to us, at the moment. The study compares these two techniques regarding:

- a. Duration of surgery
- b. Post operative wound healing time
- c. Post operative wound infection rate
- d. Fecal incontinence
- e. Recurrence after surgery

HISTORY

Treatment of Fistula in ano date back to the days of Hippocrates. Today, the Cryptoglandular Basis of Parks classification is the widely accepted one. Treatment of intersphincteric fistula has proved most challenging as it crosses the external sphincter. Though various treatments have been suggested over the years, there is no absolute Gold Standard.

Hippocrates used horse hair with lint as seton which was periodically tightened.[1]

Albucascus and John of Ardene tried to rely on patience for treatment but patients often wanted quick treatments.

Complex fistulas treatment using setons has been described in ‘Treaties of Fistulas’ by Ardene.

Frederick Salmon successfully treated Charles Dickens in 1835, urging him to open “The Infirmary for the Relief of the Poor Afflicted with Fistula and other diseases of the Rectum”. It was then renamed as St.Mark’s Hospital for Fistula and other diseases of the rectum.

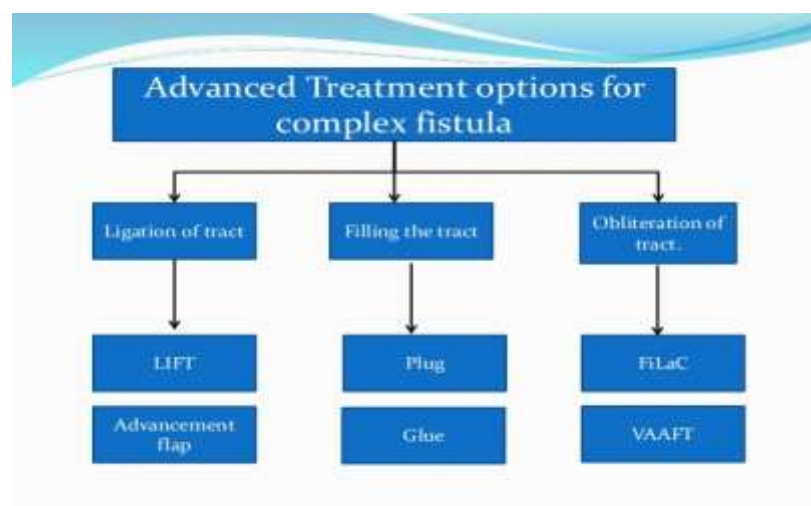
Sir Lockhart Mummy remarked that treatment of fistula is usually difficult, more so than complete excision of rectum or gastroenterostomy.[1]

Recently many treatment options have popped up for Fistula in ano. Anal advancement flaps are argued to be the best even though requirement of greater skill, pain, bleeding and other complications pose counter arguments.

Fistula plugs are considered effective based on a trial in UK but their efficacy compared to other methods is not well demonstrated.

Ligation of intersphincteric fistula tract (LIFT) and its modifications have produced promising results.

Treatment of Fistula in ano aims at getting rid of the fistula, preserving sphincter function and preventing recurrence. Prognosis is usually affected by complexity and underlying disease that caused the fistula in the first place.



REVIEW OF LITERATURE

Rojanasakul et al., from Thailand in 2009 developed the LIFT technique saving the anal sphincter with the success rate of 94.4%. The advantage of LIFT technique are anal sphincter saving, minimal tissue injury hence a shorter healing time and small scar.

Shanwani et al., from Malaysia studied LIFT procedure with the success rate of 82% and considered it as a safe and easy procedure to perform with good outcomes.

Alapach et al., in Thai Journal of Surgery have done a “**Comparative Study on LIFT and Conventional Fistulotomy in the Treatment of Fistula in ano at Hai Yai hospital**” concluded that LIFT is successful with shorter healing time and lower incidence of post operative anal incontinence.

“Comparison of LIFT and Fistulotomy in Treatment of Intersphincteric and Low Transsphincteric Anal Fistula- A Prospective Randomized Study” done in June 2015, a conference paper in diseases of Colon and Rectum studied in 30 patients and concluded that LIFT and Fistulotomy have similar success rates but wound healing time is significantly shorter in LIFT and Fistulotomy has an additional increase in the incidence of anal incontinence compared to LIFT.

In IOSR Journal of Dental and Medical sciences, “**A Comparative study on various techniques in Management of Fistula in ano**” done by Department of General surgery in Govt. Mohan Kumaramangalam medical college, salem and Govt. Kilpauk medical college, concluded that LIFT procedure has least or literally no intraoperative or postoperative complications with very short hospital stay, no risk of anal incontinence or stricture and no risk of recurrence.

In WJGS (World Journal of Gastrointestinal Surgery), General Surgery Department from Bangkok Hospital had done “**A Study on LIFT and its Modification in the Treatment of Fistula in ano**” and concluded that LIFT is a good procedure for maintaining continence.

Sileri.D., Franceshilli.L., Angelucci.G.P. et al., in 2011 Techcoloproctol had done a prospective observation study on “**LIFT to Treat Anal Fistula –Early results**” and suggested that this novel sphincter saving procedure is effective and safe in treating anal fistulas.

Hong.K.D., Kalsarkar.S. et al., in 2014 techcoloproctol had done a Metaanalysis and Systematic review on “**LIFT to Treat Anal Fistulas**” and showed that LIFT procedure appears to be safe and effective treatment for transsphincteric and Complex Anal fistulas.

FISTULA IN ANO

Perianal fistula is an abnormal tract or cavity that connects a primary opening inside the anal canal to a secondary opening in the Perianal skin. These fistulas are often confused with Hidradenitis Suppurativa, infected Inclusion cysts, Pilonidal sinus or Bartholin gland abscesses in females.

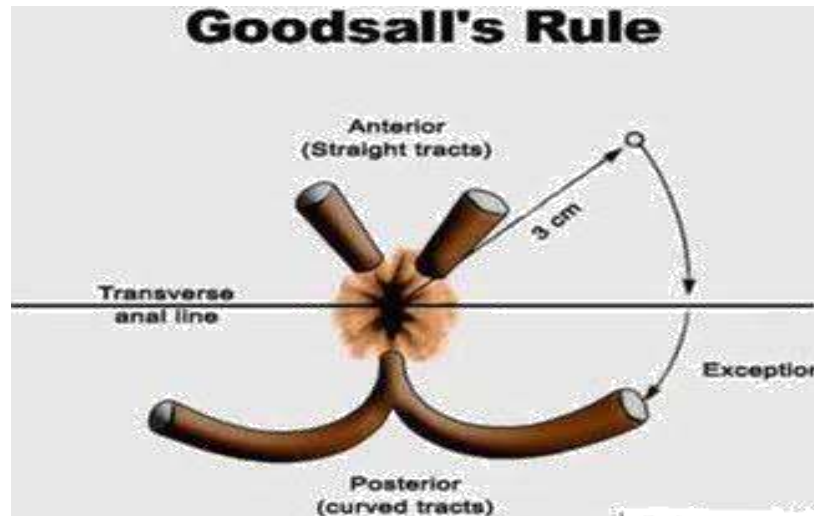
They often arise due to infection resulting in abscess. Symptoms range from minor discomfort to pus discharge with hygiene problems to sepsis.

References to Fistula in ano date back from the time of Hippocrates. Late nineteenth and early twentieth centuries saw the works of prominent surgeons and physicians in this condition. Treatment remains challenging, surgery being the treatment of choice[4,5,6].

GOODSALL'S RULE

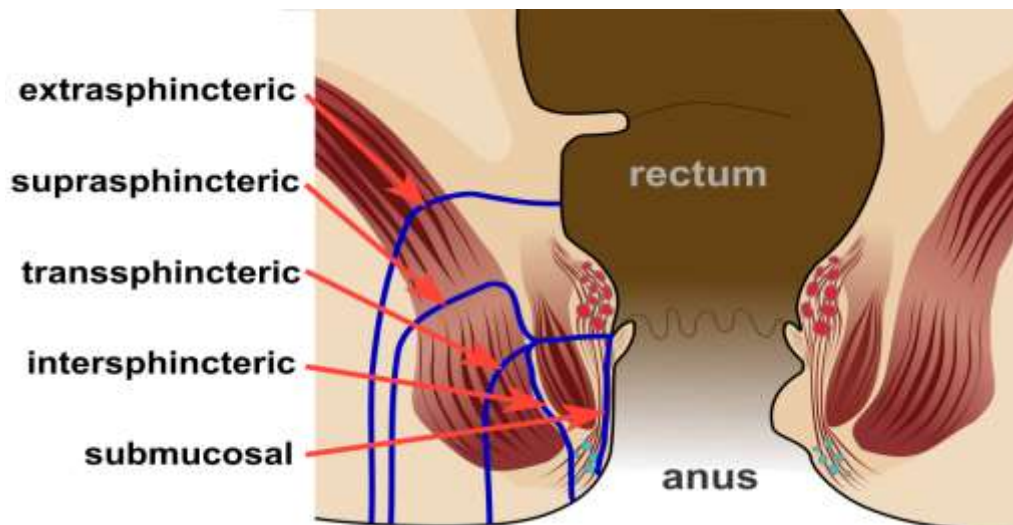
The Goodsall rule helps to anticipate the anatomy. It states that fistulas with external opening anterior to a plane passing transversely through the center of the anus will follow a straight radial course to the

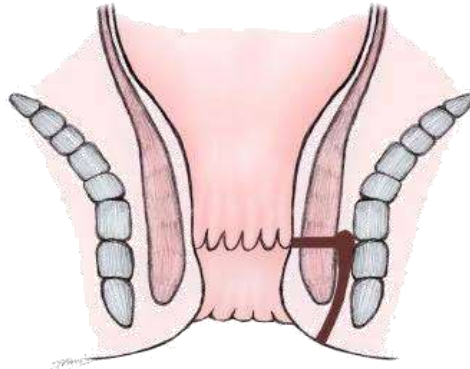
Dentate line and the fistulas with their openings posterior to this line will follow a curved course. Exceptions to this rule are external openings lying more than 3 cm from the anal verge.[7,8]



CLASSIFICATION

One of the most commonly used systems is the Parks classification System. According to this classification, Perianal fistulas are classified into four types[9]





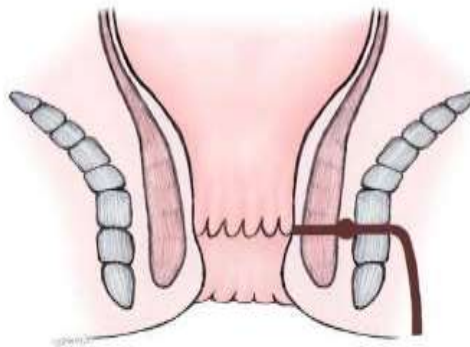
INTERSPHINCTRIC FISTULA

Comprises of 70%

fistulas Due to

Perianal abscess

Begins at Dentate line, tracks through the internal sphincter to the space between the two anal sphincters and terminates in the perianal skin.

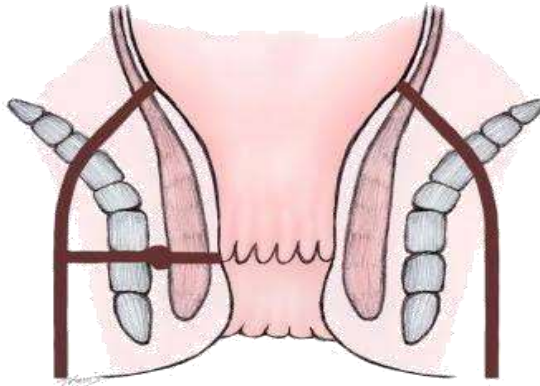


TRANS-SPHINCTERIC FISTULA

Comprises of 25% fistulas

Due to Ischiorectal fossa abscess

Tracks from Dentate line into the Ischiorectal fossa to the Perianal skin.

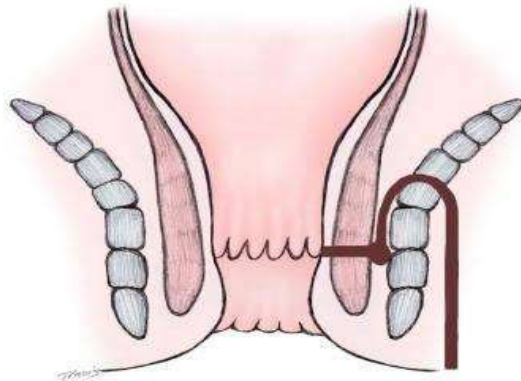


SUPRASPHINCTERIC FISTULA

Comprises of 5%

Due to Supra levator abscess

Passes from the Dentate line to the Intersphincteric space superior to the Puborectalis, then curves downwards laterally to the External Anal sphincter, into the fossa and finally into the skin.



EXTRASPHINCTERIC FISTULA

Only 1%

Due to foreign body penetration, penetrating injury, Crohns disease, carcinoma, Pelvic Inflammatory Disease.

Runs from the skin through the Ischioanal fossa, tracks upwards and through Levator Ani, to the Rectal wall completely outside the sphincter. Procedural terminology gives the following types, in classification of Perianal fistulas.

Subcutaneous Submuscular

Complex, recurrent Second stage

ETIOLOGY

- This was usually caused by a previous Anorectal abscess.
- The Anal crypt glands arranged circumferentially at the level of
- Dentate line provide a path for infecting organisms. After treatment a tract lined by granulation tissue is left behind.
- 7-40% of cases occur after an Anorectal abscess[10,11].
- Trauma, Crohn's disease, Anal fissure, carcinoma, radiation, TB and other causes may also predispose to Fistula in ano.
- Incidence of fistula from anal abscess ranges from 26%-38%.[12].

Mean patient age is 38.3 years.[13]

CLINICAL PRESENTATION

- History of pain during defecation
- History of swelling and drainage of abscess
- Bleeding PR
- Diarrhea
- Skin excoriation of perianal region
- External opening
- In a complex fistula, the patient may have history of Inflammatory Bowel Disease, Diverticulitis, previous radiation, TB, steroid therapy or HIV infection.

PHYSICAL EXAMINATION

The entire perineum should be observed for an external opening that may appear as an sinus opening or elevation of granulation tissue.

Digital rectal examination (DRE) may reveal fibrous tract or cord beneath the skin. Spontaneous discharge of blood or pus may be expressible.

The relationship between the Anorectal ring and the position of the tract must be determined before the administration of anaesthesia.

Internal opening is usually imaged by Anoscopy. Proctoscopy in case of Rectal diseases is indicated. Most patients cannot tolerate even gentle probing of the tract.

WORK UP

LABORATORY STUDIES

Physical examination remains the mainstay though normal preoperative laboratory studies are to be performed in a case of fistula in ano.

IMAGING STUDIES

Routine evaluation does not make use of radiologic studies. However, such studies are useful to identify secondary tracts in recurrent disease.[14]

Fistulography

Radiographic images are used to outline the fistula tract following the injection of contrast via the internal opening.

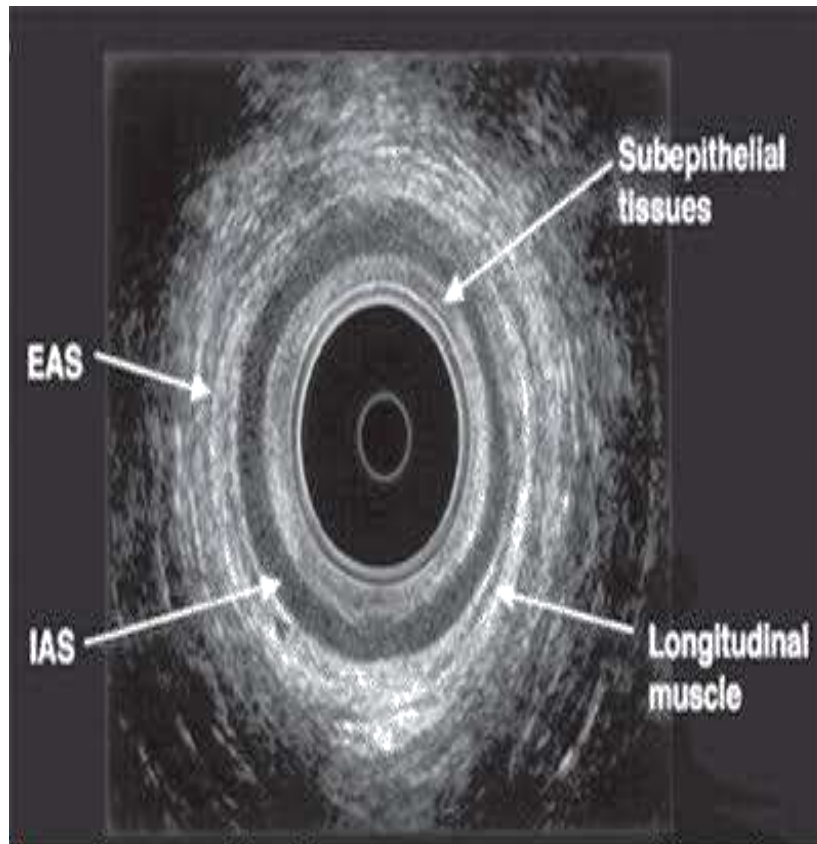
It may be painful and requires the ability to visualize the internal opening. It is 16-48% accurate.[15]



Endoanal/endorectal ultrasonography

A 7 MHz or 10 MHz ultrasound transducer is passed into the Anal canal, to differentiate between Intersphincteric and Transsphincteric lesions. Suprasphincteric lesions are defined using water filled balloon transducer.

Missed internal openings and those outlining the fistula tract can be aided by adding hydrogen peroxide through the external opening. This is better than physical examination in detecting the internal opening.[16]



A

Magnetic resonance imaging

It shows the concordance with operative findings. They are the study of choice for complex [multiple tracts] and recurrent fistulas. It provides information on otherwise unknown secondary extensions, thus reducing recurrence rates.[17,18]

There is special classification for Perianal fistulas based on MRI imaging. It is **St. James university hospital classification**. It includes five grades.

GRADE 1

Simple linear Intersphincteric fistula.

GRADE 2

Intersphincteric fistula associated with abscess and secondary tracts.

GRADE 3

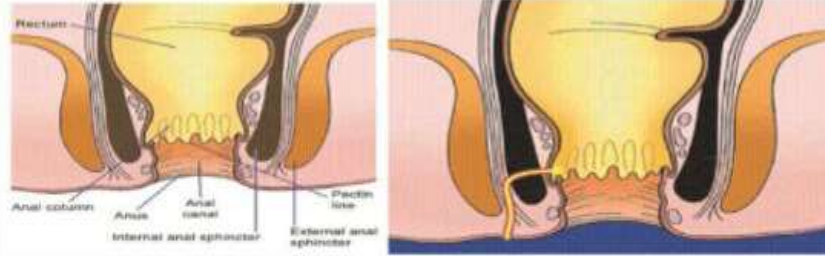
Transsphincteric fistula.

GRADE 4

Transsphincteric fistula associated with abscess or secondary tracts.

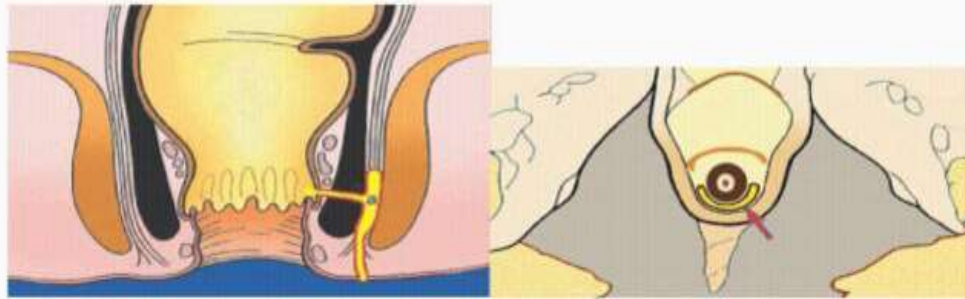
GRADE 5

Supra levator and Translevator extension

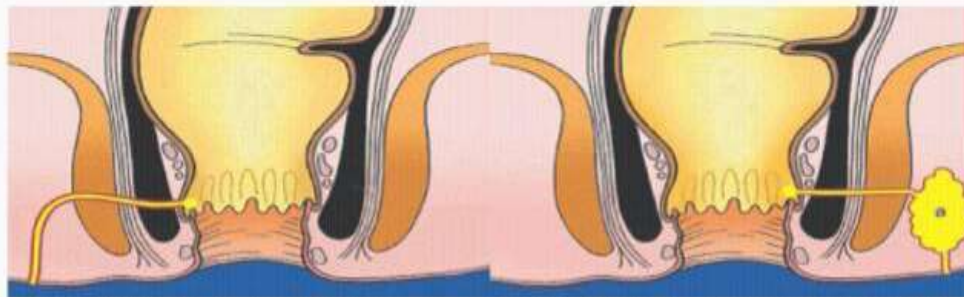


A-Normal anatomy

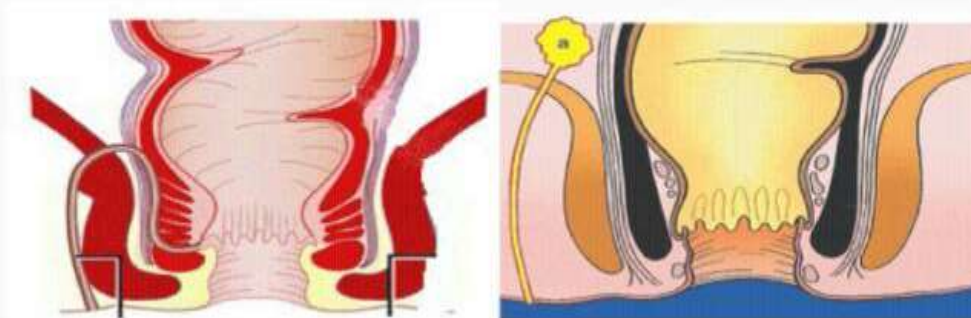
B-Intersphincteric (Grade I)



C-Intersphincteric with abscess formation (Grade II) D-Intersphincteric horseshoe (Grade II)



E-Trans-sphincteric fistula (Grade III) F-Trans-Sphincteric fistula with abscess (Grade IV)



G-Supra-sphincteric fistula (Grade V)

H-Extra-sphincteric (Grade V)

Computed tomography

This is indicated in case of Perirectal Inflammatory Disease to delineate fluid pockets. Oral and rectal contrasts are administered.

Barium enema/small bowel series

Patients with complex multiple fistulas and recurrent disease, benefit by this method.

Anal manometry

It is rarely used to evaluate Fistula in ano. However it is used for operative planning.

Surgical division of sphincter mechanism is avoided, if decrease in pressure is found.

PROCEDURES

EXAMINATION UNDER ANAESTHESIA

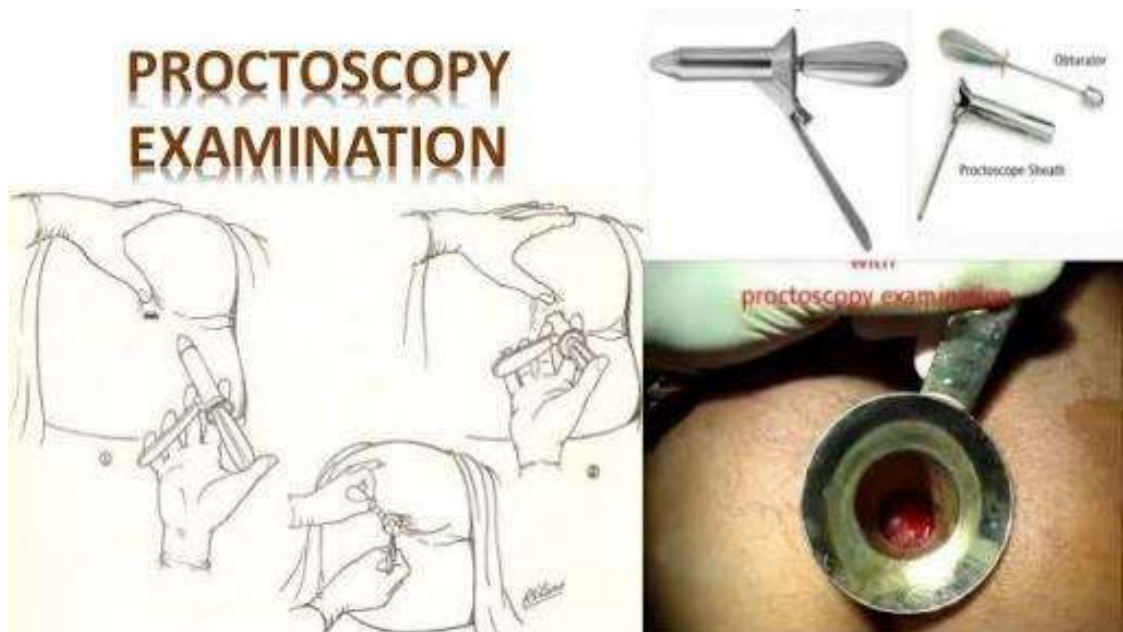
It is done before surgical intervention, if outpatient evaluation is not comfortable or not sufficient.

They help to locate the course and identify the internal opening.

1. Hydrogen peroxide, milk or dilute Methylene Blue is injected into the external opening and egress at the Dentate line is observed.
2. Dimpling or protrusion of the involved crypt may be caused by traction of external opening.
3. A blunt tip crypt probe is inserted through the external opening to reveal the direction of the tract.

PROCTOSIGMOIDOSCOPY/ COLONOSCOPY

This is done to rule out any associated disease in the rectum [malignancy].



TREATMENT AND MANAGEMENT

APPROACH CONSIDERATIONS

Symptoms of recurrent Anorectal sepsis lead to therapeutic interventions. Acute cases require incision and drainage. In case of Crohn's disease, definitive repair requires the intra abdominal disease to be controlled. Pan proctocolectomy is indicated for recurrent fistulous, if disease is with persistent sepsis.

Infliximab is responsive in 50-60% of Crohn's disease cases. Non symptomatic fistulas found on regular examination require no therapy.[19,20]

Preoperative considerations are

1. Rectal irrigation with enema.
2. General/ local anaesthesia or regional block
3. Preoperative antibiotics.
4. Prone jack knife position with buttocks apart.[21,22]

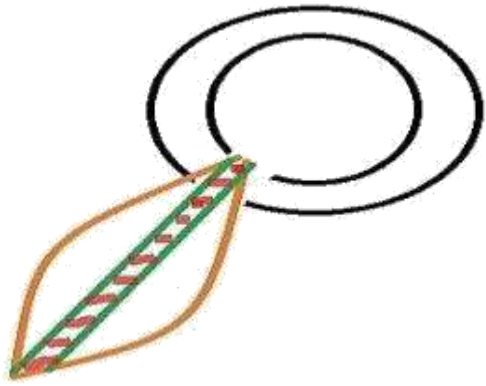
Intraoperative considerations are

1. Examination of the extent under anaesthesia.
2. Identifying the internal opening.
3. Local anaesthetic block at the end for post operative analgesia.

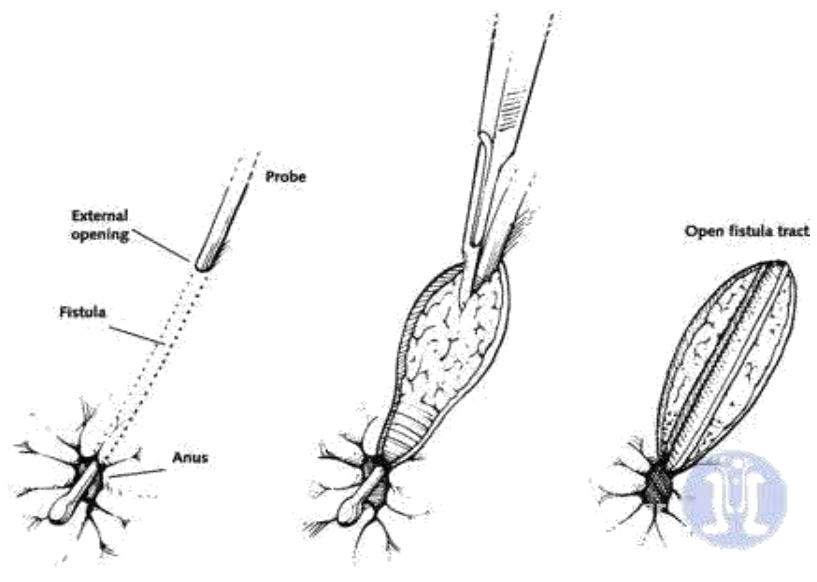
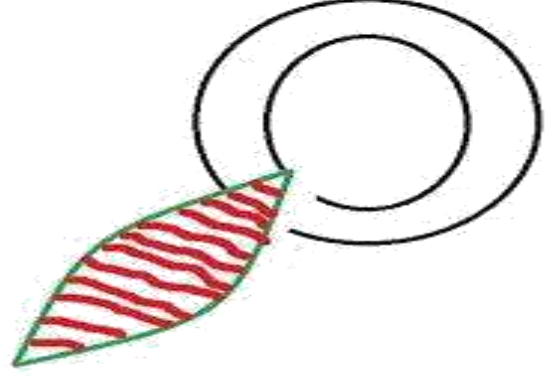
FISTULOTOMY

- 85-95% of the primary fistulas benefit by the laying open technique called Fistulotomy.[23,24,25,26,27]
- A probe is passed into the tract and the over lying tissues are divided, thereby opening the entire fibrous tract along with skin.
- At low levels, the internal and subcutaneous external sphincter are divided at right angles.
- Continence remains unaffected mostly.
- Seton placement is done if the tract courses higher into the sphincter.
- Tract base granulation tissue should be completely removed by curettage.
- Internal healing before external closure is promoted by opening the wound out on the skin, 1-2 cm adjacent to the external opening.
- Complete Fistulectomy creates larger wounds and offer no advantage in Recurrence of disease.

Fistulotomy

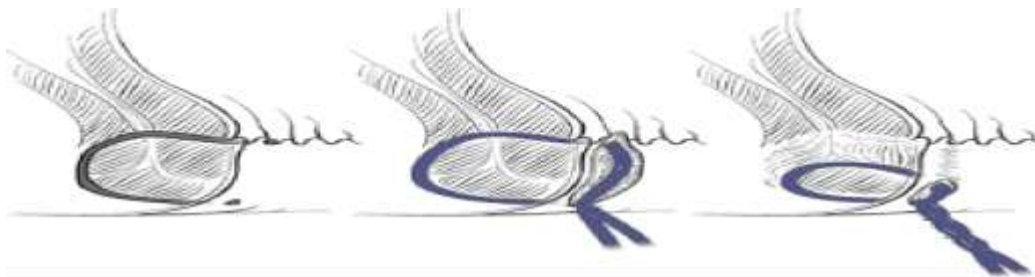


Fistulectomy



SETON PLACEMENT

- They are large silk sutures, silastic vessel markers or rubber bands that are threaded through the tract.
- They help to drain, to promote fibrosis and to cut through the fistula.
- They are useful in patients with complex [high anal], recurrent, anterior fistulas, poor preoperative sphincter pressures or in Crohn's disease.[28,29,30]



SINGLE STAGE SETON

- The seton is passed through the tract around the Deep External sphincter after opening the skin, subcutaneous tissue, Internal sphincter and External sphincter. This is then tightened and tied with a separate silk tie.
- Fibrosis occurs above the seton and exteriorizes the tract. This is tightened on subsequent visits and pulled through over 6-8 weeks.
- Recurrence of incontinence should be considered.
- However success rates are 82-100%. [31,32,33]

TWO STAGE SETON (DRAINING/FIBROSING)

- The seton is passed around the deep portion of the External sphincter. This is left loose to drain the Intersphincteric space, and to promote fibrosis.
- After the wound is healed, the seton is removed without dividing the remaining encircled Deep External sphincter.
- Success rates are 60-78%.

MUCOSAL ADVANCEMENT FLAP

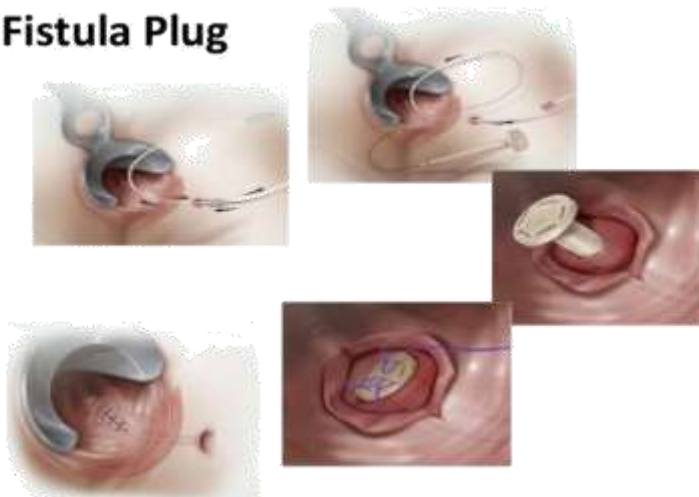
It is used specifically in chronic high fistula. It is a one stage procedure with no additional sphincter damage. However there is poor success in case of Crohn's disease or acute infection. Raise a rectal mucomuscular flap. Close the internal muscle defect with an absorbable suture and sew the flap over the internal opening so that the muscular repair is not overlapped by the suture line.[34,35]



PLUGS AND ADHESIVES

- Biotechnological advancements have led to the developments of new tissue adhesives and Fistula plugs. They offer reduced postoperative morbidity and risk of incontinence.[36,37]
- Fibrin glue treatment with one year follow up shows 40-80% recurrence rate.
- Acellular dermal matrix, Gore Bio A fistula plug show early success rates in low anal fistulas.[38,39,40]
- In Fistulizing Anoperitoneal Crohn's disease, the plug is not found superior to seton removal.[41,42]
- Transsphincteric Fistula in ano are repaired by a combined sphincter sparing method of an anal fistula plug and a rectal advancement flap.[43,44,45]

Fistula Plug



LIFT PROCEDURE

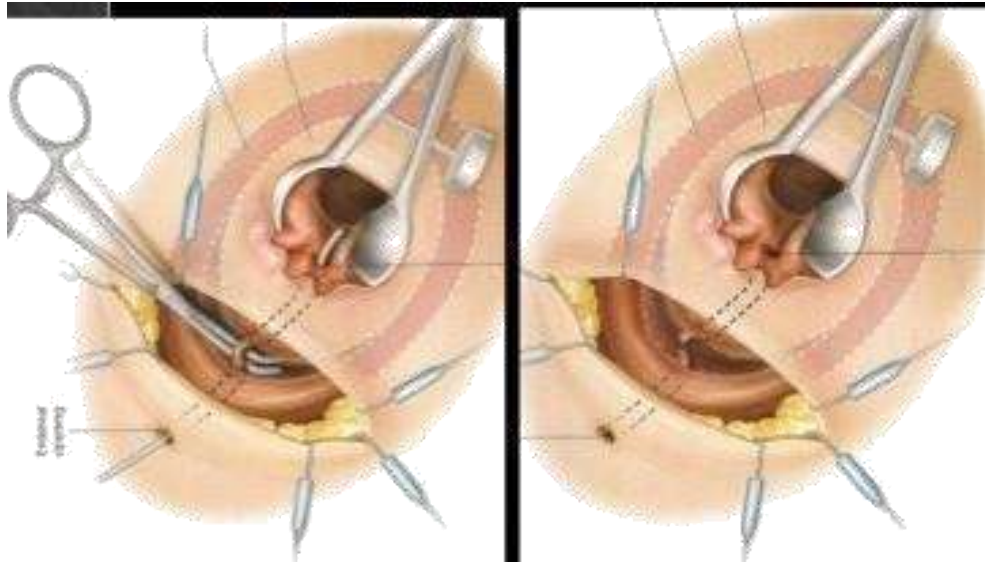
Ligation of intersphincteric fistula tract is done for complex Transsphincteric and Intersphincteric fistulas. The internal opening is closed securely and the infected cryptoglandular tissue is removed.[46]

On identifying the Intersphincteric tract, it is hooked with a small right angle clamp and ligated close to the Internal sphincter. The tract is then divided distal to the point of ligation. This is confirmed by injecting hydrogen peroxide. The external opening and remnant tract is curetted. Finally the incision is sutured loosely with an absorbable suture. The curetted wound is left open for dressing.[47]

In 2007, Arun Rojanasukul, Thai colorectal surgeon developed this procedure for the first time. The healing percentages in the first report were 94% in 2007.[48,49]

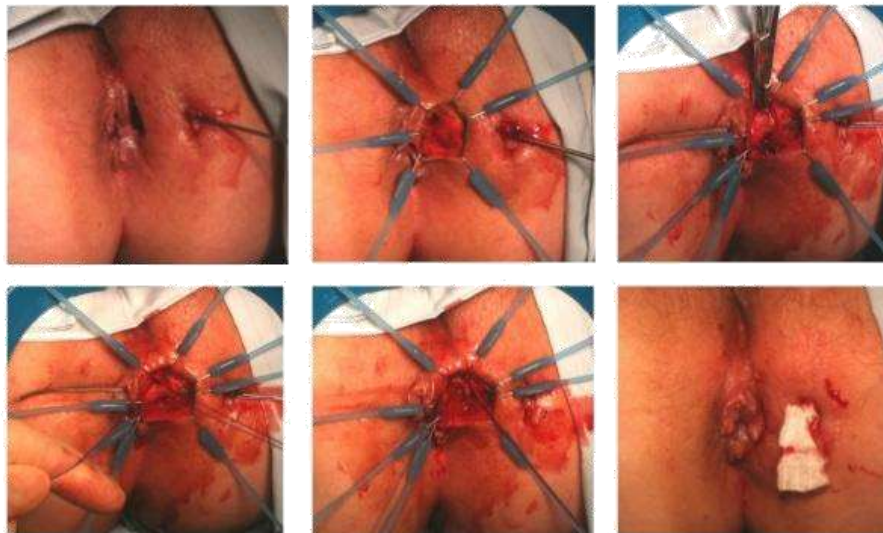
In 1993, Matos et al described a total anal sphincter saving procedure. He described an intersphincteric approach for the fistulous tract and excision of Intersphincteric anal gland infection. The technique is widely accepted.[50]

LIFT technique causes less trauma to internal sphincter when compared to the other fistula operative procedures.



Recurrence is higher than anorectal advancement flap. However time to return to work is shorter.

LIFT Procedure



The steps of novel LIFT procedure are as follows

1. First identify the internal opening by injecting dye through the external opening.



2. Make an incision at the Intersphincteric groove and dissect along the Intersphincteric plane until the Intersphincteric fistulous tract is identified.



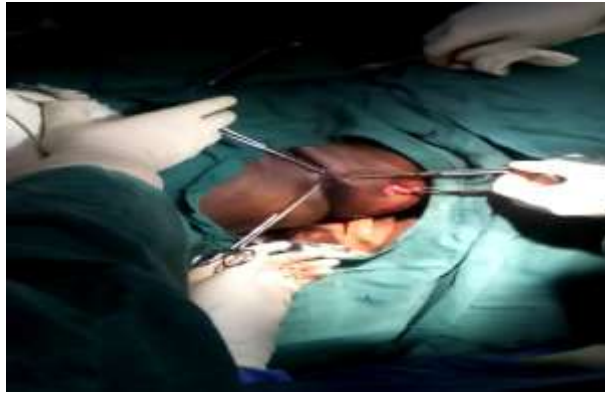
3. Identify the Intersphincteric tract and Hook out the Intersphincteric fistula tract



4. Suture ligate the tract using absorbable suture material and the fistula tract is removed.



5. From the external opening curette is passed upto the ligature and curettage is done.



6. External sphincter defect is identified and suture ligated



7. Intersphincteric wound is closed.



FISTULECTOMY

Fistulectomy is one of the treatment methods to resolve anal fistulas. This procedure offers higher chance of permanent recovery from the disease when compared to drainage seton, fistula plug or fistulotomy. It also helps to completely resolve associated symptoms like chronic diarrhea and incontinence.

Fistulectomy is different from Fistulotomy. Fistulotomy is a procedure used for the treatment of anal fistula in which it involves simply cutting the fistulous tract and the tract is laid open to facilitate healing.

Fistulectomy is a procedure in which the entire fistulous tract is removed completely. Fistulectomy is a more effective procedure than Fistulotomy but it offers a bigger raw area and hence it has a slightly longer recovery period and has some increased risk of complications post operatively.

Fistulectomy is a day care procedure done in hospitals under general or spinal anaesthesia. If no complications occur during or after the procedure, patient can be discharged immediately after the anaesthetic effects have worn off.

Before proceeding to surgery, the surgeon injects a contrast dye through the external opening of the fistula or he uses an imaging film , i.e either an X ray or MRI to make sure of the course of the fistulous tract. In this procedure, Surgeon must remove all the three parts of fistula

1. External opening
2. Internal opening
3. The tract

Make sure of the sphincter muscle integrity as much as possible during the procedure. The procedure takes only around 45 minutes to an hour and patients take about 4-6 weeks to heal completely.

Fistulectomy is an invasive procedure and it involves medium to large incisions in the anal region. Hence it has increased risk of complications post operatively mainly post operative pain and infection.

Other important risks of Fistulectomy include:

Severe scarring

Distortion

Recurrence

Incontinence.

DIVERSION

Complex persistent Fistula in ano due to Perineal Necrotizing Fasciitis, severe Anorectal Crohn's disease, reoperative Rectovaginal fistulas and radiation induced cases require the creation of fecal diversion.

POST OPERATIVE CARE

- Sitz bath
- Analgesics
- Stool bulking agents
- Close follow up with discharge instructions.

COMPLICATIONS

EARLY:

1. Urinary retention
2. Bleeding
3. Fecal impaction
4. Thrombosed hemorrhoids

LATE

1. Recurrence
2. Incontinence
3. Anal stenosis
4. Delayed wound healing

LONG TERM MONITORING

- Frequent visits within first few weeks
- Ensure prevention of premature internal wound closure
- Healing occurs within 6 weeks.

MATERIALS AND METHODS

Source (study population)

The patients admitted in Govt. Rajaji Hospital, Madurai at Department of General Surgery who are having Fistula in ano.

Study period

September 2018 to September 2019

Inclusion criteria

Patients giving informed consent for the procedure.

Patients aged more than 18 years of both the genders.

Patients without any comorbidities.

Exclusion criteria

Denial of consent

Patients less than 18 years of age

Fistula in ano not associated with Inflammatory Bowel Disease, TB and malignancy.

Pre existing incontinence

Sample size

Totally 60 patients divided into two groups, 30 in group I and 30 in group II admitted from the period of september 2018 to september 2019.

Group I:

Patients undergoing Fistulectomy

Group II:

Patients undergoing LIFT (Ligation of intersphincteric fistula tract)

METHODOLOGY

This study includes 60 patients admitted in the Department of General Surgery, Govt.Rajaji Hospital Madurai, during the period of September 2018 to September 2019 with Fistula in ano. The patients admitted with Fistula in ano who satisfy the inclusion criteria are selected for the study. Out of these 60 patients, 30 were randomized as group I , who had undergone Fistulectomy as treatment and remaining 30 were randomized as group II, who had undergone LIFT[Ligation of intersphincteric fistula tract] as treatment of Fistula in ano.

- In all cases, bowel preparation in the form of enema was given on the prior day of surgery.
- In the group I, Fistula in ano was treated with Fistulectomy.
- In the group II, Fistula in ano was treated with LIFT[Ligation of intersphincteric fistula tract].
- The patients were followed up for 6 months directly. Patients who did not turn up for follow up were asked to notify the development of any wound complication through postal correspondence.
- Preoperatively all patients received Inj. Ceftriaxone 1 gm i.vstat. Postoperatively all patients received
- Inj. Ceftriaxone 1 gm i.v bd and Inj. Metronidazole 500 mg i.v tds for 3 days, as antibiotics.
- All patient received analgesics.

All patients were operated under spinal anaesthesia.

During the operation, a record was kept regarding the time required for the surgery. Post operatively patients were asked to answer the questionnaire and patients were also observed for immediate post operative complications like post operative wound infection and bleeding per Rectum and late post operative complications like Anal incontinence and recurrence.

Follow up of patients was done at 1,3 and 6 months and patients are asked to fill the questionnaire in each follow up.

Data of each patient was collected as per the proforma.

Data analysis and the benefits in the treatment of Fistula in ano between Fistulectomy and LIFT was compared based on

1. Duration of procedure
2. Post operative Wound healing time
3. Post operative wound infection rate
4. Feecal incontinence.
5. Recurrence

OBSERVATION AND DATA ANALYSIS

COMPARISON OF RESULTS

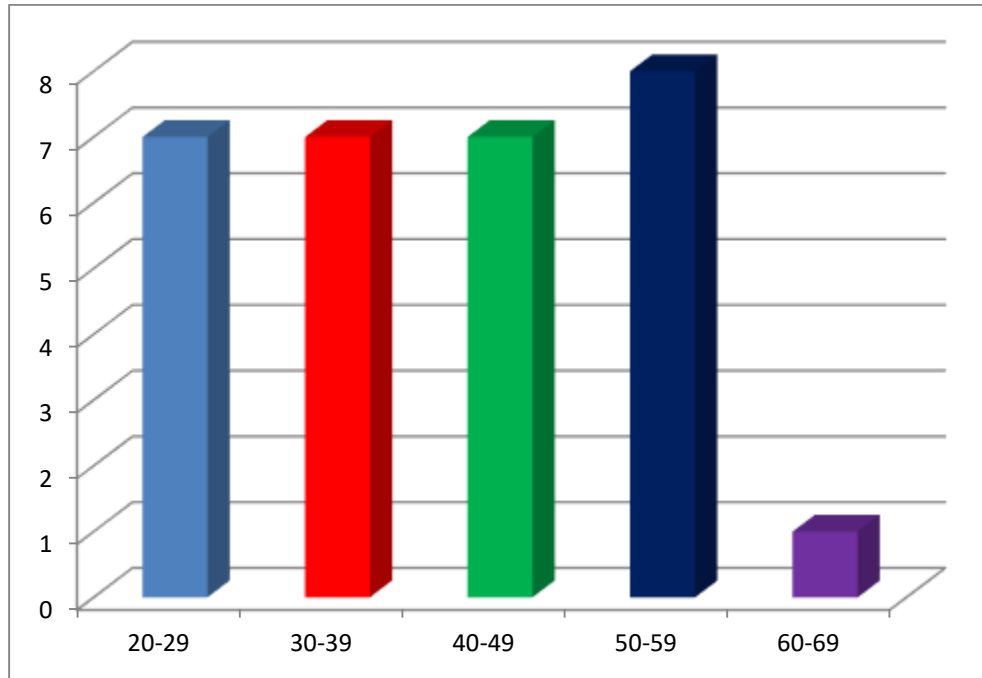
RESULT ANALYSIS

TABLE 1: AGE DISTRIBUTION

AGE DISTRIBUTION

	GROUP I	PERCENTAGE	GROUP II	PERCENTAGE
20-29	7	23.5	1	3
30-39	7	23.5	10	33.4
40-49	7	23.5	11	36.6
50-59	8	26.5	7	24
60-69	1	3	1	3

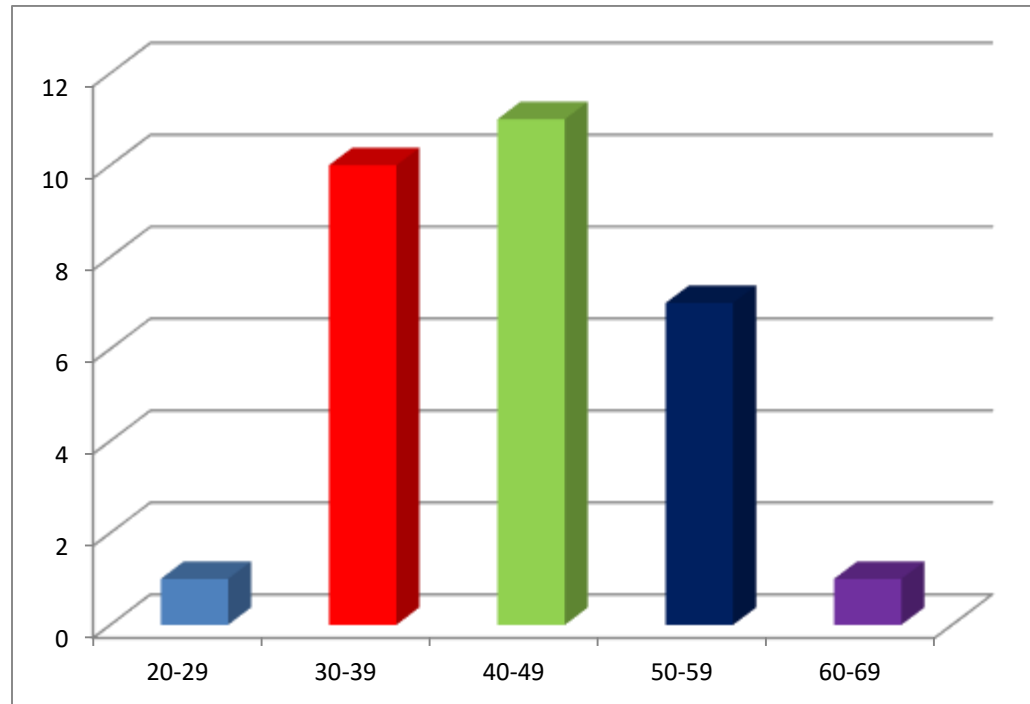
GROUP I
AGE DISTRIBUTION



In our study, group I consist of 30 patients who underwent Fistulectomy. About 50% includes age group between 40 -60 as given in the above table.

GROUP II

AGE DISTRIBUTION



In our study, group II consist of 30 patients who underwent LIFT(Ligation of Intersphincteric Fistula Tract). 33% includes age group from 30-39 and 36 of fistulas is distributed in both 40-49 age group as on the above table.

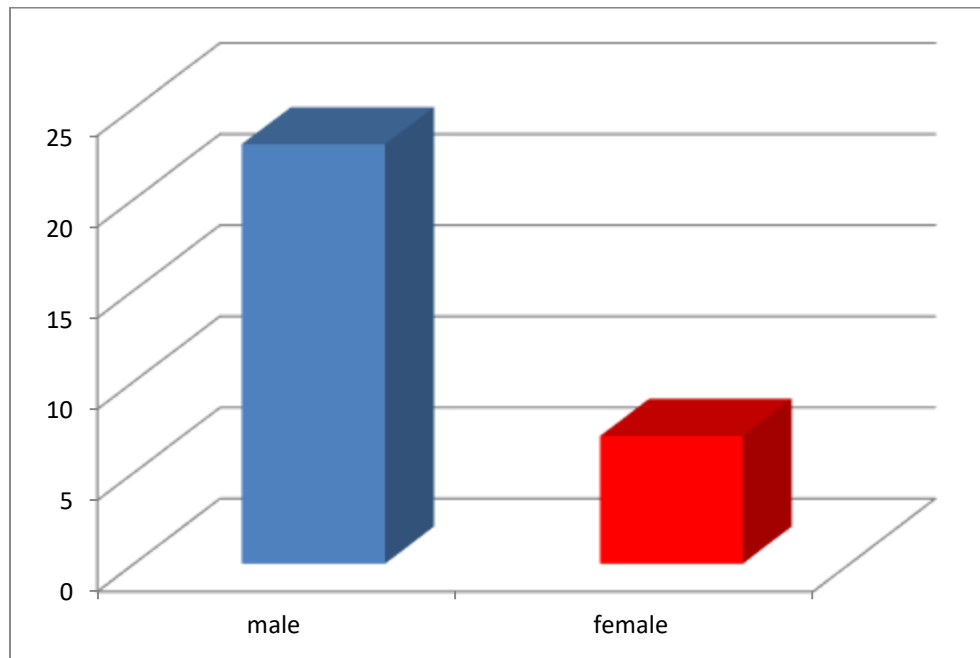
TABLE 2: GENDER DISTRIBUTION

SEX DISTRIBUTION TABLE

GROUP	MALE	FEMALE
I	23 (76%)	7 (24%)
II	21 (70%)	9 (30%)

GROUP I

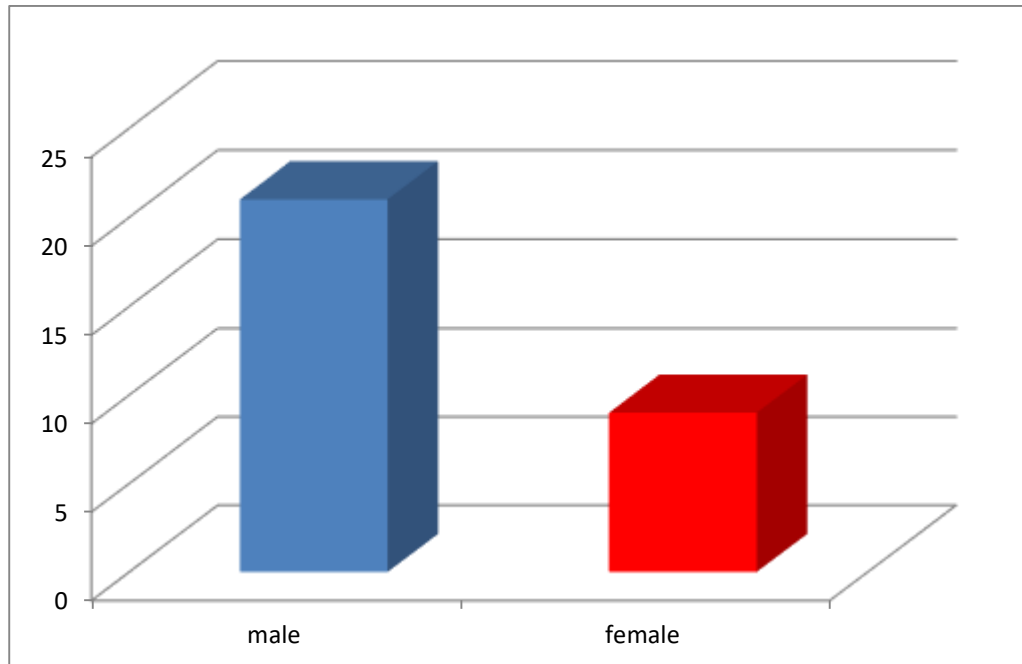
SEX DISTRIBUTION



In our study, group I consists of about 76% males and 24% females

GROUP II

SEX DISTRIBUTION



In our study, group II consists of 70% males and 30% females.

**TABLE 3: COMPARISON OF DURATION OF PROCEDURE IN
GROUP I & GROUP II**

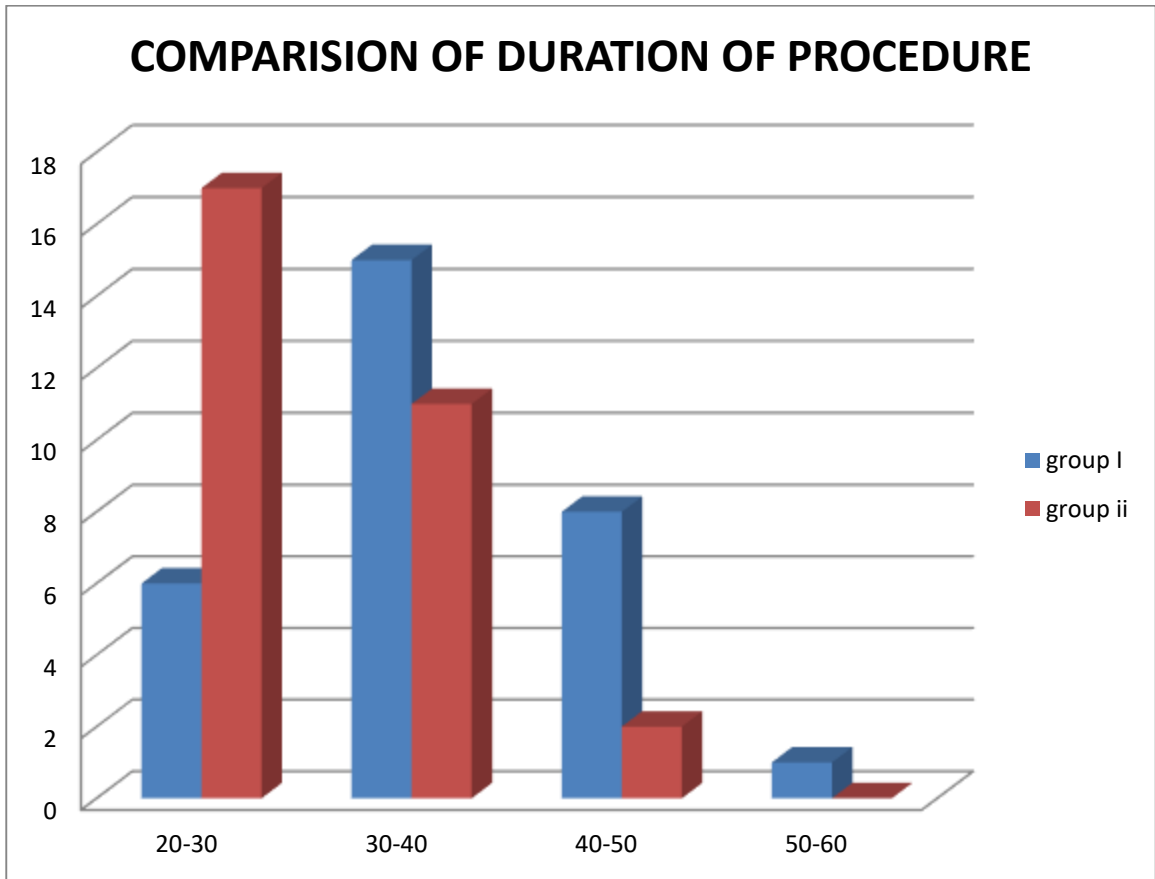
DURATION OF PROCEDURE	GROUP I		GROUP II	
	NO OF SUBJECTS	%	NO OF SUBJECTS	%
20-30	6	20	17	56
30-40	15	50	11	37
40-50	8	26	2	7
50-60	1	4	0	0

In our study, among group I patients who undergone Fistulectomy the average duration of procedure is around 40 minutes.

In our study, among group II patients who undergone LIFT procedure the average duration of procedure is around 30 minutes.

Hence, the duration of procedure is shorter in LIFT when compared to Fistulectomy.

COMPARISION OF DURATION OF PROCEDURE



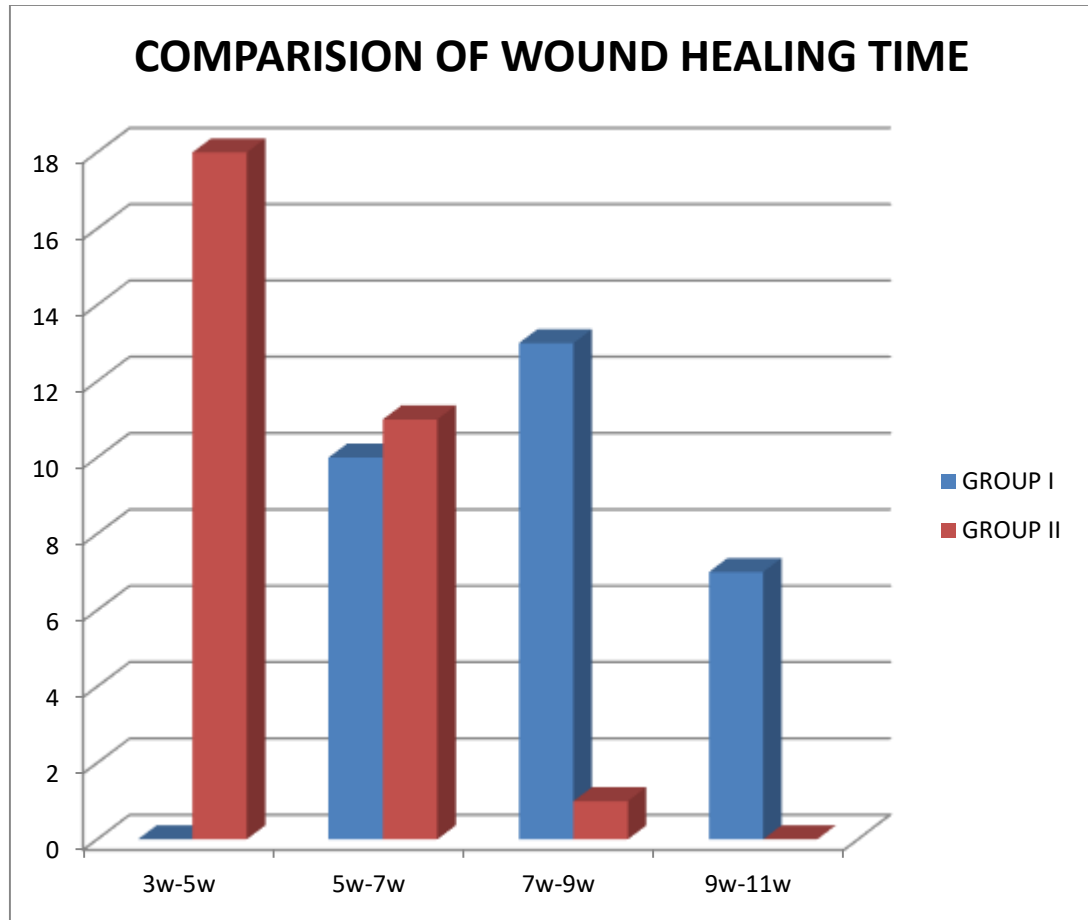
The above graph shows the comparison of duration of procedure between group A who have undergone Fistulectomy and group B who have undergone LIFT.

**TABLE 4: COMPARISON OF POST OPERATIVE WOUND
HEALING TIME IN GROUP I & GROUP II**

WOUND HEALING TIME	GROUP I		GROUP II	
	NO OF SUBJECTS	%	NO OF SUBJECTS	%
3-5	0	0	18	60
5-7	10	34	11	36
7-9	13	44	1	4
9-11	7	22	0	0

In our study, among group I the average post operative wound healing time is around 8 weeks.

In our study among group II the average post operative wound healing time is around 5 weeks.



The above graph shows the comparison of post operative wound healing time among group I who have undergone Fistulectomy and group II who have undergone LIFT procedure

Hence, post operative wound healing time is shorter in LIFT procedure than Fistulectomy and hence hospital stay is less among LIFT procedure patients when compared to Fistulectomy.

**TABLE 5: COMPARISON OF WOUND INFECTION RATE IN BOTH
THE GROUPS**

**COMPARISON OF WOUND INFECTION RATE IN BOTH
GROUPS**

GROUP	WOUND INFECTION RATE				CHI SQUARE VALUE	P VALUE
	YES	%	NO	%		
I	12	40	18	60	5.4545	0.0195*
II	4	14	26	86		

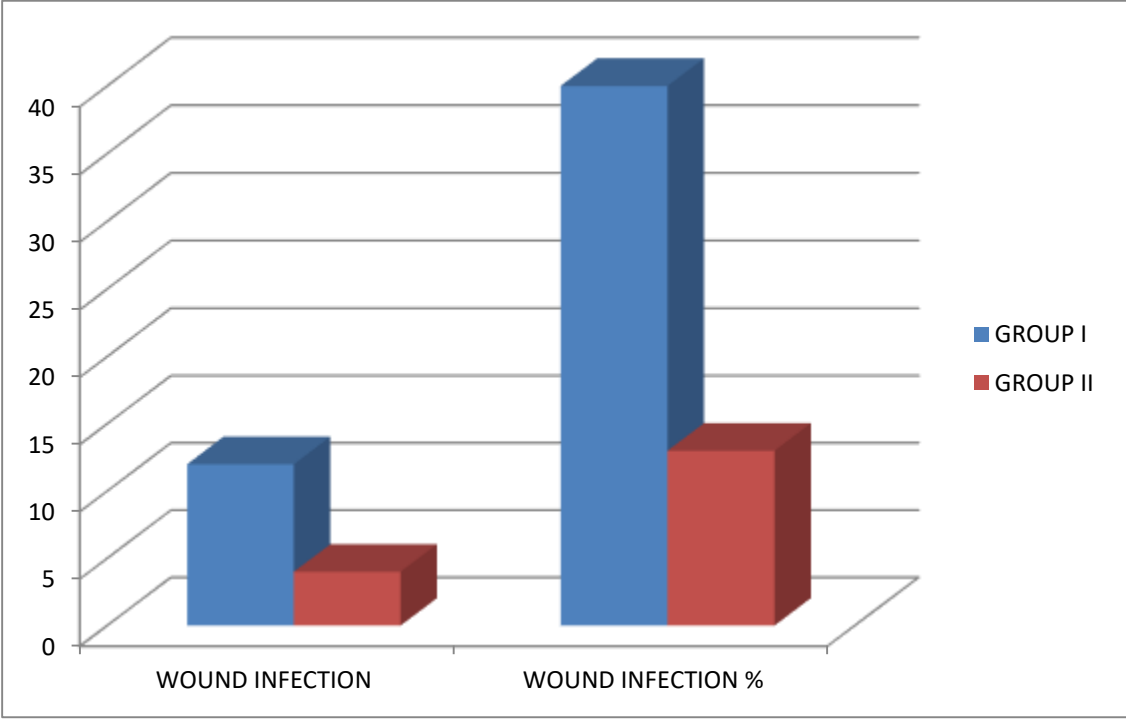
* P value less than 0.05 so significant

The chi square value is 5.4545

The p value is 0.0195

This analysis shows that the result is significant at $p < 0.05$

**COMPARISON OF WOUND INFECTION AND WOUND
INFECTION PERCENTAGE**



This comparison shows that post operative wound infection rate is higher in Fistulectomy than LIFT procedure

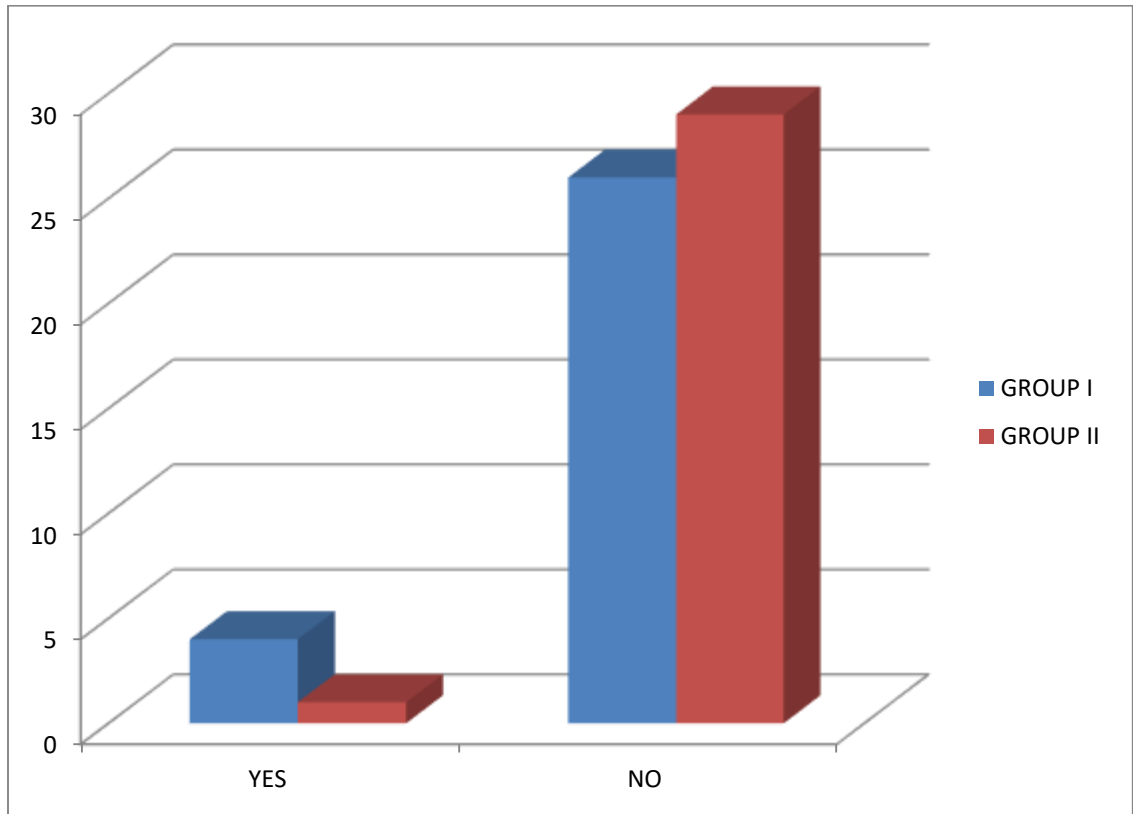
TABLE 5: COMPARISON OF RECURRENCE IN BOTH THE GROUPS

GROUP	RECURRENCE			
	YES	%	NO	%
FISTULECTOMY	4	13.3	26	86.6
LIFT	1	3.3	29	96.6

In our study, among group I 30 patients who undergone Fistulectomy 4 patients developed recurrent fistula[13%],among group II 30 patients who undergone LIFT[Ligation of intersphincteric fistula tract] 1 patient developed recurrent fistula.

This comparison shows that post surgical recurrence rate is slightly higher in Fistulectomy than LIFT procedure

RECURRENCE



The above graph shows the comparison of post surgical recurrence, among group I who have undergone Fistulectomy and group II who have undergone LIFT procedure

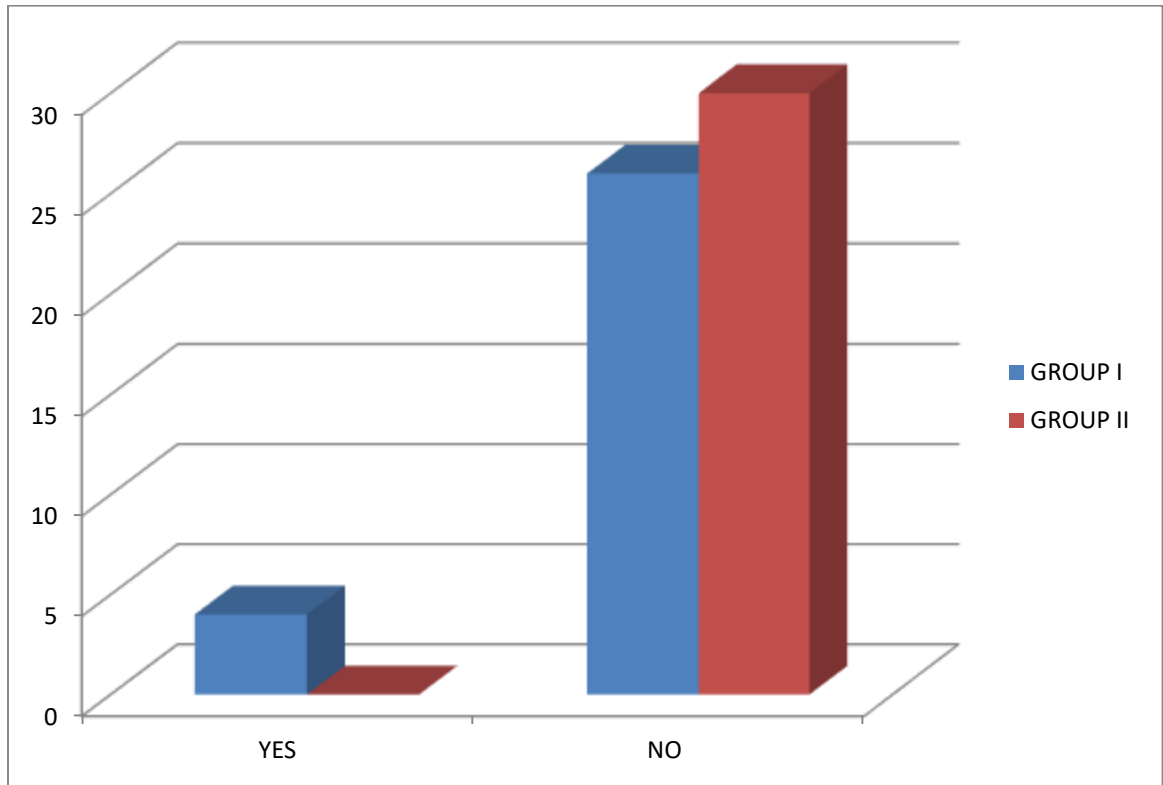
**TABLE 7: COMPARISON OF FECAL INCONTINENCE
THE GROUPS**

GROUP	FECAL INCONTINENCE			
	YES	%	NO	%
FISTULECTOMY	4	13.3	26	86.6
LIFT	0	0	30	100

In our study, among group I patients who undergone Fistulectomy 4 patients developed fecal incontinence for a short period.among group II 30 patients who undergone LIFT[Ligation of intersphincteric fistula tract] none of the patient developed fecal incontinence.

This comparison shows that fecal incontinence rate is slightly higher in Fistulectomy than LIFT procedure.

FECAL INCONTINENCE



The above graph shows the comparison of fecal incontinence, among group I who have undergone Fistulectomy and group II who have undergone LIFT procedure

DISCUSSION

Total number of patients analysed for this study were 60, among which 30 patients had undergone Fistulectomy and were grouped as group I. The other 30 patients had undergone LIFT (Ligation of Intersphincteric Fistula Tract) and were grouped as group II.

In this study, in group I, 30 patients underwent Fistulectomy as the treatment for the Fistula in ano and about 97% of the patients were above 20 and below 50 years of age. In group II, 30 patients underwent LIFT as the treatment for the Fistula in ano, similarly as in group A about 94% were included within 30-50 years of age. Hence summing up both the groups, the incidence of Perianal fistula is more between the age group of 20 and 50 years of age.

In this study, in group A, out of the 50 patients who underwent Fistulectomy as the treatment of Fistula in ano Group I, about 76% were males and remaining 24% females. Similarly in group II , out of the 30 patients who underwent LIFT as the treatment, about 70% were males and remaining 30% were females. Hence summing up both the groups and on analyzing the results, the incidence of Perianal fistula is slightly predominant in males.

In this study, in group I, of the 30 patients who underwent Fistulectomy, preoperative record showed that duration of procedure for Fistulectomy of around 76% falls between 30-50 minutes. Hence the average duration of procedure for performing Fistulectomy is around 40 minutes. Similarly preoperative record showed that duration of procedure for LIFT, around 93% falls between 20-40 minutes. Hence the average duration of procedure for performing LIFT is around 30 minutes. On summing up both the groups the duration of procedure for performing LIFT procedure is shorter when compared to Fistulectomy.

In our study post operative follow up period, post operative healing time is measured in weeks in group I and group II. In group I, who underwent fistulectomy 78% falls between 6-9 weeks, average post operative healing time for fistulectomy is 8 weeks. Similarly in group II who underwent LIFT, 60% falls between 3-5 weeks, average post operative healing time for LIFT is 5 weeks. On summing up both the groups, the average post operative healing time is less for LIFT procedure.

Hence post operative hospital stay is also less for patients undergone LIFT compared to fistulectomy.

In our study post operative wound infection rate is compared. In group I 30 patients underwent fistulectomy 12 patients developed wound infection because of increased time of procedure, large incision ,more manipulation, large raw area exposed post operatively. Among 30 patients in group II who underwent LIFT only 4 patients developed wound infection. On comparison wound infection rate in fistulectomy is more when compared to LIFT procedure and chi square value is 5.4545 and p value is <0.0195. Hence the study is significant and shows the LIFT procedure lesser infection rate when compared to fistulectomy in the treatment of fistula in ano.

In our study on comparing post operative fecal incontinence in group I and group II. In group I 30 patients underwent fistulectomy 4 patients developed fecal incontinence for a short period .Among group II 30 patients undergone LIFT procedure in which none of the patient developed fecal incontinence. Hence it shows LIFT has lesser incidence of fecal incontinence rate.

In our study on comparing post operative fecal incontinence in group I and group II. In group I 30 patients underwent fistulectomy 4 patients developed recurrent fistula .Among group II 30 patients undergone LIFT procedure in which 1 the patient developed fecal recurrence. Hence it shows LIFT has lesser incidence of recurrence rate.

CONCLUSION

General surgeons perform surgeries for Fistula in ano day in and day out as elective procedures. Fistula in ano is more common nowadays because of improper hygiene.

3 major basic aims of Fistula in ano surgeries are

1. Control of sepsis
2. Closure of fistula
3. Maintenance of continence.

Nowadays, operations for Fistula in ano are classified as sphincter sacrificing and sphincter sparing surgeries. Sphincter sacrificing surgeries includes Fistulotomy and Fistulectomy. Sphincter sparing surgeries includes Anal fistula plug, Anal advancement flap, Seton usage and LIFT (Ligation of Intersphincteric Fistula Tract).

In our hospital set up Fistula in ano is mostly treated with Fistulectomy which is a standard procedure. Post operatively many patients had delayed healing time and increased hospital stay due to large wound and some patients developed postoperative anal incontinence due to sphincter injury which affects patients' day to day activities.

The present study compared the utility and effectiveness of two standard procedures LIFT (Ligation of Intersphincteric Fistula Tract) and Fistulectomy in terms of duration of procedure, wound healing time, duration of hospital stay, wound infection rate and short term incontinence.

This study proves that the LIFT procedure gives better outcomes when compared to Fistulectomy in the treatment of Perianal fistula. LIFT is a less time consuming procedure than the Fistulectomy, so there is also decreased complication due to prolonged anaesthesia. Post operative surgical site wound infection rate is of less percentage in LIFT when compared to Fistulectomy and the rate of incidence of fecal incontinence and recurrence also less in LIFT than Fistulectomy.

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PROFORMA

Id of the patient:

Sex :

Date:

Investigator name:

Pre-operative data

Date of birth:

Smoking history (current smoker (Y orN):

Medical history (COPD, diabetes, cardiac disease, TB):

Preoperative Radiotherapy or chemotherapy:

Preoperative long term corticosteroids:

Previous perianal surgeries:

Previous history of inflammatory bowel disease or lower GI malignancy:

Grading of fistula in ano :

Intra op details

Type of operation:

Type of anaesthesia:

Length of incision:

Blood loss:

Operation time duration:

Antibiotic prophylaxis:

Suture material:

Pain medication:

Post-operative data

Duration of stay in Ward:

Surgical site infection:

Bleeding per rectum:

Fever:

Wound gaping and discharge:

Difficulty in passing stools or anal incontinence:

Pain scoring by visual analog score on post op day 1 and 5 and at discharge:

Post op follow up: during each visit once a week in first post op month

and biweekly from second post op month

Activities of daily living:

Return to occupation:

MASTER CHART

NAME	AGE	SEX	IP NO	PROCEDURE TYPE	DURATION (MINS)	WOUND HEALING TIME IN WEEKS	WOUND INFECTION/ GAPPING	FECAL INCONTINENCE	RECCURRENCE
Thalaivarsamy	63	M	6823	Fistulectomy	40	6	0	0	0
Jeyaraj	36	M	2594	Fistulectomy	35	8	0	0	0
Selvi	47	F	7589	Fistulectomy	30	7	0	0	0
Chinnayan	36	M	4630	Fistulectomy	40	7	1	0	1
Chellayee	29	F	3431	Fistulectomy	45	9	0	0	0
Selvamani	30	F	6964	Fistulectomy	55	8	0	1	0
Muthupandi	52	M	5335	Fistulectomy	35	9	1	0	0
Krishnamoorthy	55	M	5847	Fistulectomy	25	10	1	0	0
Kousalya	27	F	3584	Fistulectomy	30	7	1	1	0
Sasidharan	24	M	5689	Fistulectomy	35	8	0	0	0
Sudalai	25	M	2011	Fistulectomy	45	8	0	0	0
Salim	43	M	2404	Fistulectomy	45	7	0	0	0
Muthupandi	49	M	8230	Fistulectomy	40	10	1	0	0
Ramesh	29	M	5421	Fistulectomy	40	8	0	1	1
Ramachandran	35	M	1335	Fistulectomy	40	11	1	0	0

Pidari	30	F	9547	Fistulectomy	45	6	0	1	1
Abbas	27	M	1059	Fistulectomy	40	8	0	0	0
Mubarak	36	M	1171	Fistulectomy	45	10	0	0	0
Karmegam	39	M	2510	Fistulecto	35	7	1	0	0
Subramani	51	M	4695	Fistulectomy	40	9	1	0	0
Ramraj	54	M	4995	Fistulectomy	35	6	0	0	0
Chittu	26	M	6296	Fistulectomy	35	8	1	0	0
Jeyaraman	50	M	7453	Fistulectomy	30	8	0	0	1
Karandhamalai	44	M	7378	Fistulectomy	25	10	0	0	0
Karuppaiyah	51	M	1191	Fistulectomy	30	7	1	0	0
Shajahan	40	M	1400	Fistulectomy	35	8	0	0	0
Muthupidari	42	F	3588	Fistulectomy	45	11	1	0	0
Rolan	41	M	7238	Fistulectomy	50	10	1	0	0
Kannan	53	M	7986	Fistulectomy	35	8	0	0	0
Ayyammal	58	F	8465	Fistulectomy	50	7	0	0	0

NAME	AGE	SEX	IP NO	PROCEDURE TYPE	DURATION (mts)	WOUND HEALING TIME IN WEEKS	WOUND INFECTION/ GAPPING	FECAL INCONTINENCE	RE CCURRENCE
Murugan	50	M	6024	Lift	35	5	0	0	0
Dinesh	30	M	3975	Lift	25	4	0	0	0
Thangam	30	F	7267	Lift	25	4	0	0	0
Kanagaraj	33	M	7709	Lift	30	6	1	0	0
Manikandan	300	M	8077	Lift	20	5	0	0	0
Singaravelan	37	M	6973	Lift	35	5	0	0	0
Mary Jeyarani	46	F	7587	Lift	25	6	0	0	0
Alagammal	54	F	7657	Lift	25	4	0	0	1
Thirunavukarasu	55	M	1125	Lift	40	4	0	0	0
Karuppaiya	40	M	2005	Lift	35	5	0	0	0
Salaimuthu	50	M	3118	Lift	25	8	1	0	0
Indra	60	F	4444	Lift	30	7	0	0	0
Murugan	42	M	5142	Lift	35	4	0	0	0
Anandham	54	F	1828	Lift	30	5	0	0	0
Indra	43	F	2657	Lift	30	7	0	0	0
Raja	40	M	2768	Lift	25	7	0	0	0
Selvam	48	M	3060	Lift	40	6	0	0	0

Mariyam	42	F	3324	Lift	45	6	1	0	0
Selvam	58	M	3485	Lift	35	4	0	0	0
Kannan	34	M	3561	Lift	30	5	0	0	0
Raja	35	M	4423	Lift	25	5	0	0	0
Perumal	46	M	4296	Lift	35	6	0	0	0
Shanmuganathan	53	M	5886	Lift	20	4	0	0	0
Thangapandiyammal	37	M	2488	Lift	25	5	0	0	0
Priyadharshini	22	F	3870	Lift	35	4	1	0	0
Sadik Basha	49	M	4611	Lift	35	7	0	0	0
Saravanan	47	M	4874	Lift	25	7	0	0	0
Ramar	37	M	5272	Lift	30	4	0	0	0
Pandiselvi	35	F	5944	Lift	45	6	0	0	0
Periya samy	48	M	3480	Lift	40	4	0	0	0

LIFT - Ligation of inter sphinteric fistula tract

YES-1

NO-0

ETHICAL COMMITTEE APPROVAL LETTER



MADURAI MEDICAL COLLEGE
MADURAI, TAMILNADU, INDIA -625 020
(Affiliated to The Tamilnadu Dr.MGR Medical University,
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ETHICS COMMITTEE CERTIFICATE

Name of the Candidate : Dr.Krishnamoorthi A
Course : PG in MS., General Surgery
Course of Study : 2017-2020
College : MADURAI MEDICAL COLLEGE
Research Topic : A prospective study of ligation
on intersphincteric fistula tract
(LIFT) in fistula in ano
Ethical Committee as on : 25.09.2018

The Ethics Committee, Madurai Medical College has decided to inform
that your Research proposal is accepted.

Member Secretary

Chairman

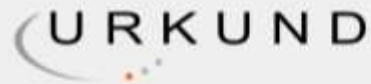
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CHAIRMAN
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Madurai

DEAN
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MADURAI - 625 020

25 SEP 2018

ANTI – PLAGIARISM CERTIFICATE



Urkund Analysis Result

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Submitted: 22/10/2019 10:55:00
Submitted By: beeboyking@gmail.com
Significance: 11 %

Sources included in the report:

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https://www.researchgate.net/publication/40687901_Ligation_of_the_Intersphincteric_Fistula_Tract_LIFT_A_Sphincter-Saving_Technique_for_Fistula-in-Ano



CERTIFICATE

This is to certify that this dissertation titled **“A PROSPECTIVE STUDY OF LIGATION OF INTERSPHINCTERIC FISTULA TRACT (LIFT) FOR FISTULA IN ANO IN GOVERNMENT RAJAJI HOSPITAL, MADURAI”** of the candidate **Dr.A.KRISHNAMOORTH** with registration number **221711113** for the award of M.S degree in the branch of **GENERAL SURGERY**. 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 **11** percentage of plagiarism in the dissertation.

Guide and supervisor sign and seal