VOL- IX | ISSUE- IX | SEPTEMBER | 2022 | PEER REVIEW e-JOURNAL | IMPACT FACTOR 7.331 | ISSN 2349-638x

Surgical Anatomy of Anal Canal W. S. R. To Treatment Aspects of Parikartika

Dr.Sanjaykumar Dhonde (M.S. Ayu)
Associate Professor, Dept of Shalyatantra, ARAC Manchi Hill.
Dr.Vishal Tamhane (M.S. Ayu)
Associate Professor, Dept of Shalyatantra, ARAC Manchi Hill.
Dr. Matin Shaikh (M.S. Ayu)
Assistant Professor, Dept of Shalyatantra, ARAC Manchi Hill.

Introduction

Ayurveda is enriched with various treatments for the vyadhi by means of bheshaj, panchakarma, shastrakarma, ksharkarma, agnikarma etc. specific indications are also mentioned wherever necessary in the texts while describing vyadhi and its avastha.

Parikartika is one of the most common vyadhi in day to day ira. Keeping the purpose to treat the disease in mind one has to know surgical anatomy of anal canal and treatment aspects of parikartika vyadhi along with nidanapanchak. In this article surgical anatomy of anal canal and treatment aspects according to ayurveda and modern science is elaborated.

Anteriorly - The anal canal is related in the male to the apex of the prostate and to the membranous and bulbous parts of the urethra. In the female it is related to the lower third of the vagina.

Posteriorly - The canal is related to the tip of the coccyx and to the anococcygeal raphae.

Laterally – Ischiorectal fossa .

Surgical Anatomy and Physiology of Anal Canal

The Anal canal commences at the level, where the rectum passes through the pelvic diaphragm and ends at the anal verge (the external or distal boundary of the anal canal). The anal canal is 3.8 cms long. It extends from the ano-rectal junction to the anus. It is directed downwards and backwards, and terminates at the anal margin. It is surrounded by sphincters, which keep the lumen closed in the form of an anterio posterior slit. Two clearly palpable landmarks in this connection are the ano- rectal rings and the anal inter muscular depression. The muscular junction between the rectum and anal canal can be felt with the finger as the thickened ridge. This is called as the ano rectal "bundle or ring" The anus is the surface opening of the anal canal situated about 4 cm below and in front of the tip of the coccyx, in the cleft between the two buttocks. The surrounding skin is pigmented and thrown into radiating folds and contains a ring of large apocrine glands.

Relations:

Interior of the anal canal:

It shows many important features and can be divided into 3 parts like

(A) The upper part, about 15 mm long
(B) The middle part about 15 mm long
(C) The lower part about 8 mm long.

Each part is lined by a characteristic epithelium and reacts differently to various diseases of this region.

(A) Upper part (mucous membrane) It is about 15 mm long lined by mucous membrane and is of endodermal origin. The mucous membrane shows 6 to 10 vertical folds; called as the anal columns of Morgagni. Short transverse folds of mucous membrane called as anal valves unite the lower ends of the anal column to each other. Above each valve, there is a depression in mucous called as anal sinus. The anal valves together form a transverse line that runs all around the anal canal. This is the pectinate line or dentate line. Occasionally the anal verge show epithelial projections called anal papillae.

(B) Anal canal above the dentate line is lined by Cubical epithelium and below from squamous epithelium.

(C) Above dentate line supplied by autonomic nerves (insensitive) and below from spinal nerves (very sensitive)

(D) Venous drainage of anal canal above dentate line by portal venous system and below systemic venous system.

B. Middle part (Transitional zone of pectin): Its length is 15 mm and is also lined by mucous membrane, but is devoid of the anal columns. The mucosa has a bluish appearance because of a dense venous plexus that lies between it and the muscle coat. The mucous is less mobile than in the upper part of the anal canal, this region refereed as "pecten or transitional zone". The lower limit of the pecten often has a whitish appearance because of which, it is referred as the 25

"white line of Hilton". The crypt of Morgagni is a small pocket between inferior extremities of the columns of Morgagni. Into several of these crypts, mostly those situated posteriorly, open one anal gland by a narrow duct. This duct bifurcates, and the branches pass outwards to enter the internal sphincter muscle in 60% of people. Issuing from this ampulla there are 3-6 tubular sub – branches that extend into the inter muscular connective tissue where they end blindly.

C. Lower part of Anal Canal: It is about 8 mm long and is lined by true skin containing sweat and sebaceous glands. The epithelium lining of the upper 15mm of the canal is columnar (or stratified columnar) that lining of the middle part (pecten) is stratified squamous, but it is distinguished from skin in that there are no sebaceous or sweat glands or hair, in relation to it. The epithelium of the lowest part resembles that of true skin in which sebaceous and sweat glands are present.

Anal Canal Musculature :

The internal sphincter – It is a thickened continuation of the circular muscle coat of the rectum. This involuntary muscle commences where, the rectum passes through the pelvic diaphragm and ends at the anal orifice and 12-8mm below the level of the anal valves, where its lower border can be felt. The internal anal sphincter is 2.5cm long and 2-5 mm thick. It is pearly white in colour.

The Longitudinal muscle – It is a continuation of the longitudinal muscle coat of the rectum intermingled with fibers from the puborectalis its fibers fan out through the lowest part of the external sphincter to be inserted into the true anal and perianal skin. The longitudinal muscle fibers that are attached to the epithelium provide pathways for the spread of perianal infections and mark out tight "compartments" that is responsible for the intense pressure and pain that accompany many localized perianal lesions. Beneath the anal skin, lie the scanty fibers of the corrugator's cutis ani muscle.

The external sphincter - formerly subdivided into deep, superficial and subcutaneous portions, is now considered to be one muscle. Some of its fibers are attached posteriorly to the coccyx, while anteriorly they are inserted into the mid perineal point in the male and in the female fuse with the sphincter vagina. Unlike the pale internal sphincter muscle, which is involuntary, the red external sphincter is composed of voluntary (somatic) muscles.

The anorectal ring marks the junction between the rectum and the anal canal. The joining of the puborectalis muscle, the deep external sphincter, conjoined longitudinal muscle and the highest part of the internal sphincter forms it. The anorectal ring can be clearly felt digitally, especially on its posterior and lateral aspects. Division of the anorectal ring results into permanent incontinence of faeces. The position and length of the anal canal as well as the angle of the anorectal junction depend to a major extent on the integrity and strength of the puborectalis musclesling.

Arterial supply –

Branches from the superior, middle and inferior haemorrhoidal arteries supply to anal canal. The most important is the superior haemorrhoidal artery, the terminal branch of the inferior mesenteric artery, whose left branch supplies the left half of the canal by a single terminal branch while its right has two terminal branches. The left and right middle haemorrhoidal arteries are the branches from the internal iliac arteries and right and left inferior haemorrhoidal arteries come from the internal pudendal branches of the internal iliac vessels. In

general the superior rectal artery supplies part of anal canal above the pectinate line and the part below the pectinate line is supplied by the inferior rectal artery.

Venous drainage: -

1) Superior rectal veins-The upper and middle rectum are drained by these veins, which enter the portal system via inferior mesenteric vein.
2) Middle rectal vein:-It deains the lower rectum and upper anal canal, which open into the in ternal iliac veins and then into canal system.
3) Inferior rectal veins: - Begins from external rectal plexus drains the lower part of the anal canal.
4) Internal rectal venous plexus (Haemorrhoidal plexus): - It lies in the sub mucosal of anal canal and drains mainly into the superior rectal vein, but communicates freely with external plexus and thus with middle and inferior rectal vein.
5) External rectal venous plexus:-It lies out side the muscular coat of the rectum and anal canal communicates freely with internal plexus.
6) Anal veins: -These are arranged radially around anal margin. They communicate the internal rectal plexus and inferior recta lveins87.

Lymphatic drainage:

Lymph vessels from the part above the pectinate line drain with those of the rectum into the internal iliac nodes. Vessels from the part below the pectinate line drain into the medial group of the superficial inguinal nodes.

Nerve supply:

The rectum is supplied by both sympathetic (L1, L2) and parasympathetic (S2, S3, S4) nerves through superior rectal and inferior hypogastric plexus.

Above the pectinate line the anal canal is supplied by the autonomic nerves both Sympathetic (inferior hypo gastric plexus – L1 and L2) and Parasympathetic (pelvic splanchnic – S2, S3 and S4).

Below the pectinate line the anal canal is supplied by somatic nerves (inferior rectal S2, S3and S4)

Anal sphincters: - The internal sphincter is caused to contract by sympathetic nerves and is relaxed by the Para sympathetic nerves. The external sphincter is supplied by the inferior rectal nerve and by the perineal branch of the fourth sacral nerve.

Intrinsic reflex - Mediated by local enteric nervous system. This is described as: when faeces enter the rectum, distension of the rectal wall initiates afferent signal that spread through the mesenteric plexus to initiate peristaltic waves in the descending colon, sigmoid and rectum, forcing faeces towards the anus.

The function of Rectum and Anal canal is the defecation. The act of daefecation is stimulated by-the distension of the wall of the rectum produced by the mass movement of feacal material. Two "Daefecation reflexes" i.e intrinsic reflex and Gastro – colic reflex.

The peristaltic wave approaches the anus, the internal sphincter relaxed by inhibitory signals from the mesenteric plexus, if the external anal sphincter is consciously, voluntarily relaxed at the same time, defecation willoccur. Also the afferent signals entering the spinal cord initiate other effects such as the diaphragm and abdominal muscles contract and the glottis is closed. Aforced expiration against the closed glottis raises the intra abdominal pressure so called"straining at stool". The act of defecation is the contraction of the longitudinal muscle of the distal colon and rectum, which shortens and straightens the pelvic – rectal passage. The legato ani muscles pull the anal canal upward and this together with relaxation of the sphincter aids invaginate the faeces.

Gastro - Colic Reflex – The conscious urge to defecate is mediated by stretched mechano-receptors and distension of the rectum (i.e. rectal pressure increase to 18mm Hg and reach up to 55mm Hg). The reflex response consists of contraction of the rectum, relaxation of the internal anal sphincter, but contraction of external anal sphincter and increase peristaltic activity in sigmoid colon. The sphincter is maintained in a state of tonic contraction and moderate distention of the rectum increases the force of its contraction. Eventually, a pressure is reached in the rectum that triggers reflex relaxation of the external anal sphincter and allowing the faeces to be expelled.

Fissure –In –Ano Definition:

The term "fissure" generally denotes a crack or a split or a cleft or a groove. The Anal fissure or fissure-in-Ano has been described as an acute superficial break in the continuity of the anoderm (anal skin) usually in the posterior midline of the anal margin. Definition of Fissure in Ano as per the opinion of different authors is mentioned here.

"An anal fissure appears to be a longitudinal crack in the anal skin, but in reality it is a true ulcer of the skin of the wall of the anal canal"(Nesselrod).

An elongated ulcer in the long axis of the anal canal(Bailey and love)

"Thes quamous mucosa of the lower half of the anal canal is prone to super ficial ulceration, which present clinically as an anal fissure. It is a linear ulcer, usually situated in the posterior commissure of the canal" (Devis Christopher)

"An anal fissure is a site of chronic ulceration of the skin of the anal canal, often with a haemorrhoids or hypertrophied anal papilla at its upper end91.

"This is a common disease of the anus which causes an amount of the suffering out of all proportion to the size of the lesion. A fissure consists essentially of a crack in the skin lived part of the anal canal which often shows a considerable reluctance to heal "(Goligher)92.

"An abraded mucosa may progress to produce a superficial anal fissure. (Nixon and O'Donnell).

Fissure in Ano is a painful linear ulcer in the long axis of the lower third of the anal canal.

Longitudinal tear in the lower end of anal canal results in fissure in ano. It is the most painful condition affecting the anal canal.

Inspection:

Separation of the anal margins will reveal the lower end of the fissure. The patient must be asked to relax the muscles as much as possible at this stage, an idea of the depth of the fissure can be gained, and also whether muscle fibers are visible at its base. If, on separating the anal margins, a discharge of pus is seen coming from the base of the fissure, the added complication of a sub mucous abscess is certain. The external opening of a related dorsal fistula may be evident. Presence of sentinel tag indicates chronic fissure.

Palpation:

With a finger should be done if possible in order to decide if the fissure is superficial and impalpable, or whether it is deep and indurated. In duration is a certain sign of chronicity, and implied that operative treatment is inevitable. Next the condition of the anal sphincter will be noted. In recent fissure there will probably be marked spasm both the internal sphincter and of the external sphincter, and on palpating the anal canal the intramuscular depression will be very evident. In case of chronic fissure fibrosis and contracture of the internal sphincter will be clearly felt. When a finger has been passed into the lower rectum, a bi-digital examination of the fissure should be done. If a well-marked induration's is present, one should conclude that suppuration at its base has occurred. The finger should then be gently swept round the upper extremity of the fissure to determine if a fibrous polyp is present; it is most important that the presence of polyp should be correctly diagnosed and the consequent necessity for operation established without delay. Palpation of the lower end of a fissure with a fine, curved probe, will demonstrate if undermining has taken place at its lower extremity. 38

Treatment

Most of the fissure heal 3 or 4 weeks, On the other hand chronic fissures do not heal on the conservative line of treatment. They may produce less symptoms but trouble may recur frequently. To avoid trouble to the patient one should be anxious for a quick judgment whether there is need of conservative line of treatment or surgical intervention. Thus there could be two types of treatment for fissure-in-ano.

Medical or Conservative Treatment.

Medical Treatment:

Injection treatment

Palliative:

In this treatment warm sitzbath, hot packs, careful cleaning of the anal outlet following the

passage of stools.(Anal Hygiene) and application of ointment and use of laxative is common. In this treatment the laxatives play a major role to some extent.

Avoidance of Constipation:

This is most important point in the medical treatment for fissure-in-ano. Fric. L. Has suggested for olive oil enema to avoid the constipation. John Wilson has advised to regularization of bowel habits with mineral oils or other stool softness and Sena suppositories twice daily. Mahadevan (1974) has given liquid paraffin orally, olive-oil enema or bland suppository before defecation. If the repeated anal trauma occasioned by passage of hard faeces can be avoided many fissures heal rapidly without any other treatment (Goligher) for achieving laxation as advised above now- a-days some oily preparation are in commonest use. They tend to produce soft and easy motions as advocated above e.g. Liquid Paraffin, Petrol agar, Agrol or Milpar. Khan has also advised the use of laxatives for the treatment of fissure-in-ano. Many patients are accustomed to some other purgatives. They should be advised to take it in slightly increased doses. If fissure is healed, care should be taken for regularizing the bowel habits and constipation must be avoided. If the patient does not take this care, there are more chances to recurrence of fissure. All proctologists as Bacon and Nesselrod have given the above suggestion. For withdrawal of the purgatives, gradually the doses are reduced till the patient finds that he can evacuate easily without becoming constipated. During this treatment 'if a surgeon does not take care about the purgation and patient passed liquid stool for months together there are more chances of anal stenosis.

Injection of long acting local anesthetics :

Sensory nerve supply to the skin in the region of an anal fissure is divided from the inferior rectal nerves, and blocking of these nerves by long acting anesthetics injection can give relief from pain of fissure-in-ano. These anaesthetics are prepared in sterile oily media, the object of which is to delay the absorption of the anesthetics agents and prolong its local action. Well known preparation Nupercaine and Proctocaine and so many other preparations are available in the market now a day.

Technique of Injection:

Taking proper aseptic care the injection should be injected producing a wheal of ½% Lignocain in the skin 2.5 cm. Behind the anal verge and needle being injected at this part, 5-10 ml drug may be injected immediately behind the anus, deep to the fissure, and skin should be sealed with Tr.Iodine, Second injection should not be given in less than 3 months, and it is probably unwise for this treatment to be repeated within period of one year.

Long acting an aesthetics are in very common use from the 1920's and 30's , being strongly recommended by Gabriel (1929) and Morgan(1935) in America Yeomans Goarsch and Mathesheimer (1927) and Gorsch (1934). Not only they advocated it for fissure but also to give relief from pain after Haemorrhoidectomy. There after, Farquharson (1971). Wilson (1973), Som (1974), Mahadevan (1974), Lock (1977), and Khan (1978) all of them have suggested the use of long acting injection therapy. Further they have said that these solutions are very irritable to the skin. If there is local contamination many other complications may be produced by the use of these injections.

Use of the Anesthetic ointment:

Now a day's local anaesthetics are used as an ointment for relieving. The pain and spasm of the fissure very frequently. This treatment is adopted by every proctologist and every physician, popular preparations are 3% Decicaine (amethocaine). Percailol or Lignocain 5%. The best time for application is before defecation and after daefecation, it can be used by the help of finger or by any nozzle, but it should not touch the peri-anal skin because it produces local dermatitis and pruritis (Goligher). Now a day's similar ointment with cortisone are also used.

Anal Dilatation

The dilatation is a procedure to relieve the spasm of the anal sphincter and so reduce pressure in the anus. It is also called as blunt Sphincterotomy because few fibers of internal sphincter are divided.
Anal dilatation can be achieved by using anal dilators and by manual dilatation i.e. Lord's dilatation.In

Ayurveda text acharya sushruta also mention use of anal dileter.

The dilator is a tubular instrument. It is prepared by a metal and useful in diseases like anal structure, fissure-in-Ano and in postoperative period of rectal surgeries. The latest pattern of dilator, devised by Dr.Robert H>Thorlakson of Winnipeg. The dilators are made of a light plastic material, which is boilable, they are 3 inches (7.5cm) in length, with a small tip for easier insertion and the maximal dilatation is given over a length of 1.5 inches (4cm). The dilators are made by Allen & Hanbury's Ltd. In the following three sizes: No.1 (3/4inches or 2cm.diameter), No. 2 (7/8 inches or 2.2cm. diameter) and No. 3 (1 inch or2.5 cm. Diameter)104 .

After applying xylocain, a small dilator should be passed in to anal canal. Gradual dilatation of the anal canal is advised by using larger dilators for some days. The advantages of dilator are – It is simple technique, quick method and effective in 80 % of cases producing good results. Fissure-in-Ano is best treated by this method and there is chance of recurrence. In most rectal cases it is advisable to pass a finger through the anal canal on 5th, 6th day after operation, and thereafter daily (either with the finger or a dilator) until the anal canal is perfectly smooth and healed. The passage of a dilator is particularly important and essential.This enables the full dilatation to be applied both to the anal margin and to the entire length of the anal canal. It serves to keep the anal extremity of the wound smooth and prevents the margins from falling together, and it is not only maintains a satisfactory degree of sphincter relaxation but in various subjects it prevents sphincter spasm and contracture from developing.

Lord's dilatation was recommended by Resamier, later, the Lord (1968) was popularized the manual anal dilatation and gradual dilatation in the internal piles and fissure-in-ano. The dilatation results in rupture of circumferential submucosal pectin bands. The anal dilatation is highly important, as this will relax the anal musculature with healing of the fissures.

The disadvantage of anal dilatation is that it may some times leads to vasovagal shock. Many a times it leads to incontinence and faecal soiling, recurrance found after 2 to 4 yers.

Operative Treatment:

There is considerable divergence of opinion as to the essential step in the operative treatment of anal fissure whether it is correction of spasm and contraction of internal sphincter muscle by stretching or by partial or complete division or excision of the fissure, so as to provide a wide external wound in which the discharges can not stagnate.

Following are the Operative procedure mentioned for fissure-in-ano.

1. Excision of Anal Fissure.
2. Excision of anal fissure with immediate Skin Grafting.
3. Division of the Internal Sphincter.
4. Technique of Open Posterior Internal Sphincterotomy.
5. Lateral Subcutaneous Internal Sphincterotomy.

Conclusion:

There is no description of Parikartika as an independent disease in any of the Ayurvedic texts.

The disease Parikartika has similarity with the disease Fissure due to same clinical fetures in Ano of Modern medical science. The importance of surgical anatomy of anal canal and treatment protocol should not be neglected along with nidanaparivarjana.

References:

1. Sushruta; Sushruta Samhita; with the Nibandha sangraha commentary of Sri Dalhana charya; Reprint edition, Edited by Jadavaji Trikamji Acharya, Varanasi; Chaukhambha orientalia
2. Vagbhata; Astanga Hradaya; with commentary of Sarvangasundara of Arunadatta and Ayurveda rasayana of Hemadri,7th Ed, Edited by Dr.Anna Moreshwar Kunte and Krishna shastri Navare; Varanasi; Chaukhambha orientalia publishers
3. Kashyapa, Kashyapa Samhita, 1st Edition, Edited by P V Tewari, Varanasi; Chaukhambha orientalia publishers 1996
4. Agnivesha, Revised by Charaka and Dhradabala; Charaka Samhita; 4th Ed, Varanasi; Chaukhambha orientalia publishers
5. A randomised controlled trial to study the efficacy of shriparnyadi piccha basti as compared to yashtimadhu ghruta basti in

management of parikartika, by Dr Vijay Kabadi, submitted dissertation to MUHS
6. Manipal manual of surgery 4th edi.CBS Publisher K.Raj gopal shenoy,page no,4,772.
7. Dr.Das Soman, A concise text book of surgery, Calcutta, 13 old Mayer's court, 3rd edition, 2001,page no.10,62.
8. Bailey and Loves, Short Practice of Surgery, London, ELBS Chapman and hall, 22nd edition, 1995.
9. Pandit Hemraj Sharma,3rd edi.kashyap samhita khilsthan, antravali chikitsa aadhyay 10/102, 105, Varanasi, Chaukhamba prakashan 1976, page no.299.