Bölüm 4

MANAGEMENT OF TREATMENT AND DIAGNOSIS OF ANAL FISSURES

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LOGIN

Anal fissures are ruptures of the anal mucosa, namely the anoderm. It was first described by Lockhart-Mummery in 1934. It represents approximately 10-15% of proctologic examinations in all races globally (1). It is estimated that the lifetime incidence of anal fissures is approximately 11%, with men and women at equal risk(2). They can cause extreme pain and often bleeding. Acute anal fissures are classified as lasting <6 weeks and chronic fissures lasting >6 weeks.(Picture 1). Although many anal fissures are primary fissures with no underlying cause, secondary causes should also be investigated (3).

Anal fissures; If not treated effectively, it can lead to recurrence, infection or abscesses. In addition, it reduces the quality of life of patients, and because they avoid defecation, it can cause hardening of the stool (4). hardened stools; It causes the repetition of the tear during defecation, causing the continuation of the vicious circle.

Picture 1. Chronic anal fissure

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Anatomy

Anus; It is the opening at the lower end of the digestive system where solid wastes are removed from the body. It basically consists of the anal canal and sphincters surrounding the anal canal. Anoderm; It is the part of the anal canal between the dentate line and the anal verge. It consists of pecten and anocutaneous zone. The internal pudendal artery, which is the terminal branch of the internal iliac artery, also divides into 2-3 branches and is called the inferior rectal artery. It supplies the inferior rectal artery, anal canal, anal muscles, anal area and surrounding buttock skin. The inferior rectal vein, together with the midle rectal vein, drains blood from the anal canal, anal muscles, anal region, and surrounding buttock skin. Lymphatic drainage of the distal of the dentate line is primarily to the inguinal lymph nodes. It may also drain into the mesenteric and internal iliac lymph nodes. It is innervated by the inferior rectal (pudendal) nerve. Therefore, anal fissure is very painful, if stitches are placed in this area, it will cause pain. It contains melanocytes, but differs from normal skin in that the anoderm does not contain the skin appendages (hair, sweat, and sebaceous gland). Tactile and nociceptive (ie, pain, itching) receptors are abundant (5).

Epidemiology

Anal fissures are most common in middle-aged and young patients, with equal frequency in men and women. It is a common cause of anal pain, but systematically collected data on their exact incidence and prevalence are not available. Mapel et al. (6) conducted a study on the epidemiology and treatment of anal fissures and concluded that there are approximately 342,000 new cases of AF diagnosed each year in the

United States. Therefore, it shows an incidence of 7.8% throughout life. This indeed makes AF a common health problem. AF can also occur in children and the elderly. In children, especially recurrent stretch marks should alert a physician to the possibility of sexual abuse.(7).

Physioetiopathology

The exact etiology is still unclear, unless the anal fissure is secondary to a disorder. The initiating factor is thought to be anoderm trauma due to overstretching, especially from the passage of hard or large stools, local irritation from diarrhea, anorectal surgery, and anoreceptive intercourse. Prior anal surgery is a predisposing factor, as scarring from surgery can cause narrowing of the anal mucosa, making it more susceptible to trauma from hard stools (1, 8).

Initially, minor tears often occur in the anal mucosa, possibly due to hard bowel movement. However, in most cases, they heal quickly without long-term sequelae. In addition, constipation and hard bowel movements are reported in only 13% of patients with fissures (8).

The most commonly observed abnormalities in anal physiology studies are hypertonicity and hypertrophy of the internal anal sphincter (IAS) resulting in elevated anal canal and sphincter resting pressures compared to pressures in normal controls. The internal sphincter maintains the resting pressure of the anal canal. Ano-rectal manometry (ARM) is used to measure this pressure. Most patients with AF have increased tone of the internal sphincter, which causes the fissures to become chronic (8). These changes in anal tone are pathological and persist even after administration of local anesthetic. However, it returns to normal after surgical sphincterotomy.

Increased internal sphincter tone causes local ischemia, which prevents healing of the fissure and creates a chronic scar. The anoderm is supplied by branches of the inferior rectal arteries, and anoderm perfusion has been found to be inversely proportional to internal sphincter pressure. In addition, angiography and cadaver studies have also demonstrated the scarcity of arterioles in the posterior midline anal canal. This explains the tendency for fissure formation in the region (9).

Madalinski and Kalinowski (10) cause cell damage in the fissure area during defecation, since the stretchability of the anal sphincters is insufficient in chronic fissures. Substances from these injured cells interacted with endothelial nitric oxide (NO) and released vasoconstriction mediators, which halted the healing process. Anal fissure healing process is based on understanding the balance between nitric oxide concentration in wounds and the level of oxidative and nitroxidative stress responsible for contraction of smooth muscles (anal sphincters). Hypoxia in contracted anal sphincters increases vasoconstriction by partially reducing endothelial NO release. (Figure 1)(11).

However, the pathophysiology of anterior fissures may differ from posterior fissures. Jenkins et al.(12); prospectively evaluated 70 patients with symptomatic CAF and 39 disease-free individuals by controlled manometry and anal endosonography. The study showed that anterior anal fissures compared to posterior fissures; showed that it is associated with unclear external anal sphincter injury, lower maximum compression pressure, and impaired external anal sphincter function. It was also found that the maximum resting pressure in anterior fissures did not increase significantly, unlike posterior fissures. In addition, they showed that anterior fissures, which were detected in the younger and predominantly female patient group, were significantly associated with a history of obstetric trauma.

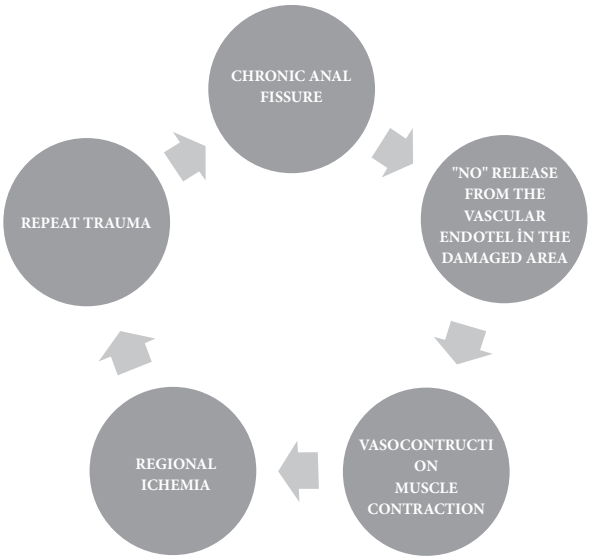

Figure 1. physiopathology of anal fissure

There are other new causes published in the literature. Garg et al.(13) He established a connection between the toilet bowl and the anal fissure. To clean the anus and perianal area, a nozzle is attached to the back of the toilet bowl. It is widely used in Asian countries. Repeated traumatization of the anus by the water current can potentially damage the anterior anal canal epithelium and lead to the development of fissures.

Sauper et al. (14) in a study to evaluate anal function in professional mountain bikers who reported functional and morphological problems in their anal regions; reported that permanent microtraumas through constant saddle vibration can lead to chronic inflammation and anal pain resulting in anal fissure.

Cox et al. (15) In a study he conducted in 2018; showed that the fissure healed after treatment for syphilis in a 29-year-old woman who presented with a perianal fissure but was found to have extensive syphilis.

Classification

Anal fissures are classified according to duration, location and possible etiology. Based on the possible causative factors, anal fissures are referred to as primary or secondary (8,17). Primary fissures have no obvious underlying cause and may possibly be associated with local trauma such as hard stools, prolonged diarrhea, vaginal delivery, repetitive injury, or anoreceptive sexual intercourse. Secondary fissures, prior anal surgical procedures, inflammatory bowel disease (eg, Crohn's

disease), granulomatous disorders (eg, tuberculosis, sarcoidosis), infections (eg, human immunodeficiency virus, syphilis, Haemophilus ducreyi, herpes, cytomegalovirus), chemotherapy, or malignancy (leukemia), may develop as a result.

Anal fissures are considered acute if they are present for less than six weeks (8). They are superficial, limited to the anoderm and have sharply demarcated, fresh mucosal margins, and there is usually granulation tissue at the base. Fissures are termed chronic if they are present for more than six weeks and have keratinous borders, a skin tag and hypertrophic anal papilla, and fibers of the internal anal sphincter are visible. These features of fissure chronicity are attributed to chronic infection and fibrotic connective tissue development (1, 8).

Most of the fissures occur in the posterior midline (90%). Anterior midline fissures constitute approximately 10-25% of female fissures and 1-8% of male fissures. Anterior and posterior midline fissures may occur simultaneously in approximately 3% of cases. Anterior fissures are most often associated with younger, mostly female patients with injury or dysfunction of the external anal sphincter due to childbirth (16,17).

Clinical Features and Evaluation

History and physical examination allow a diagnosis of anal fissure in most patients without further investigation. Symptoms are relatively specific, but AF is sometimes misdiagnosed or confused with other benign anal conditions such as hemorrhoids. 20% of hemorrhoid cases are associated with AF.

Typically, the patient reports severe tearing pain (often described as 'passing through broken glass') with the passage of stool, and the pain persists after a few minutes to hours. The pain recurs with every bowel movement, and the patient often tends to be afraid or reluctant to have a bowel movement, leading to a vicious cycle of worsening constipation, harder stools, and an increase in anal pain. About 70% of patients see a small amount of bright red blood on toilet paper or stool. Occasionally a few drops may fall into the toilet bowl, but significant bleeding is not a usual feature of an anal fissure. Some patients report irregular anal opening, discomfort when sitting or riding, itching, irritation, and a persistent prick-like sensation in the anus. The view is time dependent.

For a possible anal fissure, it is the most important step in the local physical examination. Gentle separation of the hips typically exposes the fissure. However, spasm of the sphincter can prevent proper imaging. Finger ano-rectal examination is painful in acute fissures. Although patients with chronic fissure have less pain and can tolerate the examination better, it should be postponed.

Further evaluation, including examination under anesthesia, anoscopy, endoscopy, biopsy, and imaging (ie, CT scan, MRI, or endoanal ultrasound) may be necessary in the following situations (8, 16,17):

1. diagnosis is not clear
2. fissure cannot be seen
3. there is a risk of abscess/infection
4. Patients at high risk of colorectal cancer
5. if the fissure has not healed with medical treatment
6. If the fissure has recurred after surgical treatment

Causes supporting secondary anal fissure should be investigated.

These may include:

- Inflammatory bowel disease;
- HIV/AIDS
- Viral and granulomatous diseases
- Colorectal cancer
- Dermatological conditions such as psoriasis or pruritis ani;
- Anal trauma (anal sex, surgery, pregnancy)
- Medications, eg opioids or chemotherapy.

Treatment of primary anal fissures

Non-surgical Treatment

Symptomatic Relief

It includes measures such as sitz bath, dietary changes, topical ointments to reduce the symptoms of AF. The sitz bath has long been part of the treatment algorithm for anal fissures. Suggested benefits include improved perineal hygiene, relaxation of the hypertonic internal anal sphincter through activation of the neural release of NO as a result of the somatoanal reflex, and thus reduction of pain (17). In addition, the anal region showed a significant decrease in resting anal canal pressures by manometry after a water bath at 40 °C.

Local anesthetics are used as an additional measure to reduce pain. lidocaine; It is the most common anesthetic, often used in combination with many other drugs such as minoxidil, nitrates, antibiotics (metronidazole), hydrocortisone, and betamethasone (16,17).

Anal Sphincter Relaxation

Internal anal sphincter dilation can be achieved by chemical or other mechanical means as described below.

Chemical Sphincterotomy

In the latest guidelines, topical anal sphincter relaxants, including nitrates and topical calcium channel blockers, are counted among pharmacological treatment options. The aim is to facilitate healing of the fissure ("reversible chemical sphincterotomy"), thereby temporarily reducing muscle tone and anal canal pressure. Various mechanisms mentioned in the literature include: increased NO concentration, direct depletion of intracellular calcium, stimulation of muscarinic receptors, inhibition of alpha-adrenergic receptors or stimulation of beta-adrenergic receptors (16, 17,18).

Topical Nitrates

After the discovery of the role of NO as an inhibitor of internal anal sphincter tone, topical nitrates, and in particular glyceryl trinitrate (GTN), have achieved the role of first-line therapy for CAF in many clinical trials. To reduce the number of surgical procedures for anal fissures in some European countries, a 2012 Cochrane review (18) reported that topical glyceryl trinitrate was better than placebo at healing anal fissures (49% versus 36% cure rates). However, late relapse occurred in approximately 50% of those initially treated.

Studies comparing GTN doses ranging from 0.05% to 0.4%, applied topically two to three times a day, with the most commonly prescribed dose of 0.2%, showed that the dose of GTN did not affect recovery. The major disadvantages of topical GTN are intolerance due to its side effects and generally poor patient compliance. Systemic absorption of topically applied GTN may result in vasodilation and severe headaches, resulting in treatment discontinuation in up to 20% of patients(17).

Calcium Channel Blockers

Topical Calcium Channel Blockers (CCBs) have emerged in recent years as an acceptable choice for the medical management of CAF with reasonable healing potential and low side-effect profile. Typical dosing regimens include 0.3% to 0.5% topical nifedipine three times daily and 2% topical diltiazem three times daily. Katsinelos et al. (19) showed a 93% cure rate with 0.5% topical nifedipine. Khan et al. (20) achieved an 80.4% cure rate with 2% topical diltiazem, proving that it is better than GTN in terms of recovery and side-effect profile. Side effects, particu-

larly pruritis ani, may occur in 10 percent of patients but are generally tolerated. Relapse is also a problem with topical calcium channel blockers. Nash et al. (21), more than 60% of patients experienced relapse within 2 years of end of treatment. Topically applied 0.5% minoxidil is another option, and Alvandipour et al. (22) In 2018, it showed that it is equally effective with diltiazem in the treatment of CAF and has a lower frequency of side effects. In the literature, it is recommended to apply the treatment for at least 6-8 weeks, and pain relief is generally reported within 2 weeks from the start of the treatment.

Botulinum Toxin (BT)

Botulinum toxin is an exotoxin produced by the bacteria Clostridium botulinum. When injected locally, this toxin binds to presynaptic nerve terminals at the neuromuscular junction, preventing the release of acetylcholine and thus causing temporary muscle paralysis. An average of 40000-80000 U is applied. Recent studies have shown its efficacy in reducing pain with non-persistent and minor side effects and support its role in the resolution of CAF (23). Patients should be warned of the risk of transient anal incontinence associated with BT. BT injection can be done on an outpatient basis. The local effects of BT typically fade after about 3 months, so there is a high risk of recurrence if underlying issues such as constipation causing anal fissures are not addressed.

The available evidence indicates that these injections are likely to have at least similar efficacy to both topical glyceryl trinitrate and calcium channel blockers, with reported fissure healing rates of 60-80% and the need for repeated injections, although recurrence may occur in up to 42% of patients. Common side effects include transient gas incontinence (up to 18%) and stool (up to 5%)(23,17).

Bobkiewicz et al. (24) conducted a meta-analysis in 2016 to determine the fully effective dose of CT, the number of injections per session, and the injection sites. Surprisingly, the study showed that there was no dose-dependent efficacy and the rate of postoperative incontinence was not related to the botulinum dose used. In addition, no difference was observed in the recovery rate in terms of the number of injections per session and the area.

Pilkington et al. (25)After a randomized single-center study comparing bilateral (both sides of the fissure) and unilateral injection in 2018, it was concluded that the prevention of fissure pain was similar in the bilateral or unilateral injection groups. Unilateral injection has been reported to be as effective as bilateral injections in relieving fissure pain without any deterioration in continence.

Endoscopic Anal Dilatation

In recent years, less invasive anal dilatation techniques have been developed that require neither surgery nor general anesthesia. This technique is endoscopic anal dilatation. The procedure is performed on an outpatient basis under local anesthesia with a two-valve anoscope. In a prospective study of Santander et al. (26), on patients with CAF who did not respond well to conservative treatment; identified patients with increased anal resting pressure for endoscopic anal dilatation using the ARM. Those with increased anal resting pressure were treated with controlled anal dilatation using a two-valve anoscope. They performed a second ARM after controlled anal dilatation. Anal healing of CAF and a significant reduction in maximum resting pressure recorded by manometry confirmed the success of the procedure.

Balloon Anal Dilatation

Balloon dilatation is another effective and safe alternative to surgical sphincterotomy, with a high cure rate, less risk of fecal incontinence, and endosonographically detectable sphincter damage without significant sphincter damage.

According to Renzi et al. (27) in a study treated with pneumatic balloon dilatation; investigated the clinical, anatomical and functional status of the cases prospectively. Under local anesthesia, they performed pneumatic dilation with an endoanal 40 mm balloon inflated to 1.4 atmospheres, left in place for six minutes. Anal manometry and ultrasonography; before dilation and 6-12 months later. They showed that in CAF, 1-4 days after pneumatic balloon dilation, 94% of cases became asymptomatic, with complete recovery between the third and fifth week.

Surgical Management

In cases where non-surgical treatment lasting longer than 6-8 weeks does not produce the desired results, surgical options come to the fore. The patient should be clearly informed of the risk of fecal incontinence associated with the option adopted, accompanied by informed consent. These options include:

Surgical Anal Dilatation

The concept of sphincter stretching under general anesthesia, the Lord's procedure that involves inserting four fingers of each hand into the anal canal and stretching for 3 to 4 minutes, has been practiced for many years. However, this procedure has been mostly abandoned recently due to the advent of nonsurgical measures, the unacceptably high risk of fecal incontinence (approximately 52%), and the lower incontinence rate of lateral internal sphincterotomy.

Lateral Internal Sphincterotomy

Lateral internal sphincterotomy (LIS) is the preferred surgical treatment for refractory anal fissures and can be offered as a first-line treatment option according to the practice parameters of the American Society of Colon and Rectal Surgeons. However, interruption of the sphincter predisposes to sphincter dysfunction, which can present as varying degrees of gas, fluid, or fecal incontinence.

In a 2013 meta-analysis, Garg et al. (28) showed that the overall rate of continence disorder may be as high as 5-14%, despite some recent studies. Al-Thoubaity et al.(29), found a low incontinence rate of 0.4% in their study.

Due to concerns about the deterioration of postoperative continence, various modifications to the LIS have been developed over the last two decades, and terms such as "tailor-made" or "controlled" LIS have begun to be used. The extent of sphincterotomy is determined as the percentage of sphincter dividing or the length of the distance above or below the dentate line. Numerous studies have been conducted to examine the effect of this on outcomes. As might be expected, more sphincter division is associated with a higher incidence of impaired continence; Fewer sphincter divisions produce a higher rate of fissure recurrence.

Davies et al. (30), conducted a retrospective study to investigate long-term outcomes after lateral anal sphincterotomy with a particular focus on postoperative incontinence. The success rate for postoperative fissure healing was 92%. Prolonged objective and symptomatic incontinence was reported by two (5.6%) patients. The study also emphasized that careful patient selection based on symptoms and disease chronicity can further improve outcomes.

Sphincterotomy; It can be done with open or closed technique. Open LIS was popularized by Eisenhammer. A radial incision is made in the anoderm, exposing the internal sphincter muscle fibers laterally. It is then performed with a scalpel or scissors with a sharp division under direct vision. The wound can be closed primarily or left open.

Closed LIS, also called lateral subcutaneous sphincterotomy, was introduced by Notaras. A narrow-mouth scalpel no. 11 is inserted through the lateral perianal skin and pushed upwards subcutaneously between the internal sphincter and the skin lining the anal canal. When the tip of the blade reaches the dentate line, the internal sphincter is divided by cutting from medial to lateral or lateral to medial.

Cho et al (31); recommends that the precise length of the sphincterotomy be adjusted or controlled according to the length of the anal fissure. However, many surgical texts emphasize that during closed lateral sphincterotomy, the division length of the internal sphincter should be only distal to the dentate line. The controlled

lateral sphincterotomy technique was found to protect the anal sphincter more. According to Mentese et al. (32) in a randomized, prospective study; compared the results of controlled lateral internal sphincterotomy using anal calibrators with the results of sphincterotomy up to the apex of the fissure. They reported that controlled sphincterotomy provided faster relief of pain, and the rate of early postoperative continence impairment and treatment failure was insignificantly lower.

In 2015, Liang and Church (33) presented the results of a prospective study designed to confirm the role of a second, contralateral, lateral internal sphincterotomy in the treatment of surgically recurrent CAF, with a fissure healing rate of 98% and only 4% postoperatively. Minor incontinence developed in. Thus, it proved a logical repetition of the lateral sphincterotomy. They showed that it can be applied to treat recurrent chronic fissures with minimal risk of incontinence.

Alawady et al. (34) In 2018, instead of lateral internal sphincterotomy (LIS); Posterolateral sphincterotomy (PLIS), after a proposed randomized controlled trial, showed significantly shorter recovery time and less pain. It was also found to result in greater reductions in resting anal pressure after PLIS. Continence disorders occurred less frequently than LIS; however, no significant difference was noted between the two techniques.

Lateral internal sphincterotomy (LIS) has been compared to nearly all other non-surgical and surgical options available and has earned gold standard status in CAF management because of its short- and long-term effectiveness.

Advancement Flaps

Endorectal advancement flaps; It is especially used in the treatment of patients with "low pressure" fissures. The procedure typically involves creating a subcutaneous flap with an incision made from the caudally extending anal end and then advancing into the anal canal to close the anal fissure.

Giordano et al. (35) in a prospective study of 51 patients treated with simple cutaneous advancement flap anoplasty; showed that all fissures healed in a short time and continence was unaffected. They reported that only 6% of them had salvageable flap detachment, and they were completely healed within a certain period of time. The authors suggested that simple cutaneous advancement flap anoplasty should be considered as the first-line surgical treatment for CAF, regardless of the patient's gender and anal tone.

Patti et al. (36) evaluated the incidence of anal incontinence and manometric modifications after fissurectomy and anoplasty with advancement skin flap in chronic fissures with internal anal sphincter hypertonia. They achieved a high recovery rate without surgical sequelae or anal incontinence.

Hancke et al. (37)demonstrated that the skin flap procedure was more effective than lateral internal sphincterotomy and without the increased risk of incontinence.

A meta-analysis recently reviewed in 2018 compared the efficacy of lateral internal sphincterotomy with anal advancement flap in the treatment of CAF. They showed that the anal advancement flap caused less incontinence, but similar wound complications with LIS. They also found a similar rate of unhealed fissures compared to LIS (38).

Fissurectomy

Fissurectomy involves excision of the fissure floor with chronic granulation tissue, hypertrophic papillae, and scar. The area created in this way is first left open or closed. According to Zeytun et al. (39) A recent study published in 2018 evaluated the long-term outcomes of fissurectomy as a surgical treatment for CAF and showed that fissurectomy is associated with rapid pain relief and a high success rate, although complete recovery can often be delayed. In addition, it does not appear to have a negative effect on continence.

Many recent studies have combined fissurectomy with other modalities. Andicoechea Agorria et al. (40) In 2019, showed that botulinum toxin injection combined with fissurectomy prevented the need for LIS in a high proportion of patients

Various New Treatments

Sacral Nerve Stimulation

Sakral sinir stimülasyonu, daha invaziv cerrahi müdahaleleri tercih etmeyen hastalarda, CAF için etkili ancak yeni bir tedavi seçeneğidir.

Yakovlev ve ark. (41) hastalara sakral sinir kökü stimülasyonu için, geçici elektrotlar sorunsuz bir şekilde yerleştirildikten sonra, günde 3 kez 20 dakika süreyle, stimülasyon gerçekleştirildi. Elektrotlar, 3 haftalık stimülasyondan sonra çıkarıldı. Sakral sinir stimülasyonu başladıktan sonra perineal ağrıda hemen iyileşme görülmüş ve ağrı kesici etkisi 10 ila 12 saat sürmüştür. Tüm hastalarda, CAF üçüncü haftanın sonunda iyileşmiş ve tedaviden 1 yıl sonra anal fissür nüksü olmadığını bildirmişlerdir.

Autologous Fat Tissue Transplantation

Recent evidence suggests that autologous adipose tissue transplantation promotes healing in different lesions associated with local ischemia. Lolli et al. (42) tested this technique in eight patients with CAF who had failed other medical and surgical treatment options. Purified autologous fat was taken from the hypogastrium and

transferred to the fissure. They achieved complete recovery and pain remission in 6 patients (75%). Andjelkov et al. (43) The fluid containing autologous adipose-derived regenerative cells from the fat taken by liposuction was injected subcutaneously to the edge of the fissure and the internal anal sphincter, providing complete healing of the anal fissure and the disappearance of symptoms in all patients.

Posterior Tibial Nerve Stimulation

Recent studies have shown that sacral nerve stimulation can be an effective treatment option for CAF. According to Altunrende et al. (44) conducted a prospective study to evaluate the efficacy of transcutaneous electrical nerve stimulation (TENS) in the ankle by stimulating the sacral nerve via the posterior tibial nerve. Ten patients were treated with TENS for ten days in addition to conventional medical treatment. Pain and bleeding resolved in all patients 2 days after treatment, and mucosal healing was observed in six patients 10 days after treatment. A significant decrease was noted in the scoring of pain and depression. The study concluded that TENS application to the posterior tibial nerve has the potential to be an alternative treatment option for CAF patients seeking a non-invasive treatment modality.

Aho et al. (45) A recent study in 2019 called this technique percutaneous tibial nerve stimulation (PTNS) and found that it accelerated the healing of chronic anal fissure and reduced pain and bleeding with an associated improvement in bowel function.

Ruiz Tovar et al. (46) compared the compliance rates of patients receiving glyceryl trinitrate therapy for chronic anal fissure with that of patients receiving PTNS and found that PTNS was safer and superior.

Result

Anal fissure is a common health problem that bothers patients. Although most of the cracks heal with conservative intervention, a significant portion of them become chronic and negatively affect the quality of life.

The gold standard in the management of chronic fissures is internal anal sphincterotomy. However, the procedure can be a potential cause of gas and fecal incontinence. In recent years, several modifications have emerged to make this procedure safe. In addition, a wide variety of innovative non-surgical procedures have been developed to treat the fissured patient without resorting to surgical treatment. Before choosing any option, it is important to fully evaluate the causes of secondary fissure and the patient's continence. For this reason, the most optimum treatment should be chosen after giving the patient complete information about the method, cure rates and complications (Figure 2).

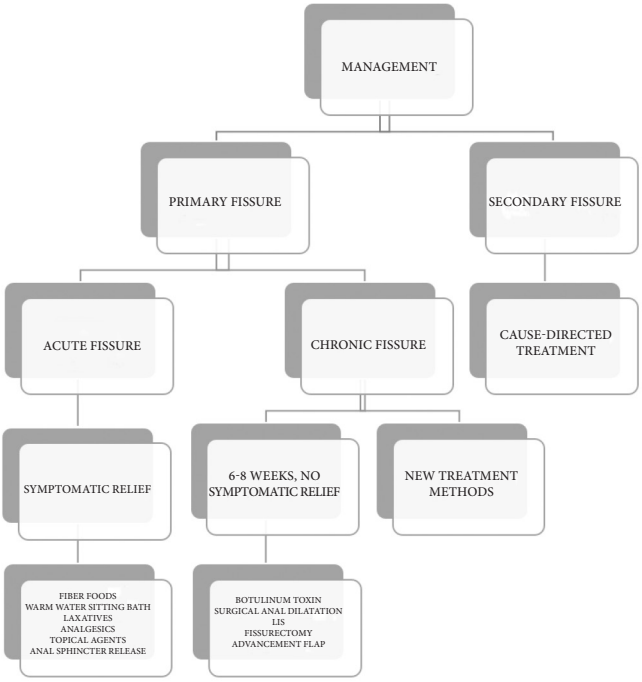

Figure 2. Anal fissure treatment management

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