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Original Research Article

# Study on the Clinical Features of Chronic Anal Fissures and Post-Operative Complications in Patients with Lateral Anal Sphincterotomy

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**Abstract:**

**Introduction:** Chronic anal fissures arise from persistent sphincter hypertonicity, reducing blood flow and impairing healing. Coagulation disorders, particularly from liver disease, heighten bleeding risks during surgical treatments like lateral anal sphincterotomy. Proper perioperative organisation is central to minimise complications and ensure optimal outcomes in patients with coagulation abnormalities experiencing fissure surgery.

**Aims and Objective:** To evaluate the clinical features of chronic anal fissure and post-operative complications in Lateral Anal Sphincterotomy (LAS).

**Methods:** This study assessed 50 adult patients undergoing lateral anal sphincterotomy (LAS) for chronic anal fissures. Strict inclusion and exclusion criteria ensured patient suitability. Preoperative assessments included medical history, lab tests, and imaging. Surgery was performed under anesthesia, followed by systematic post-op care.

**Results:** The study initiated that the main age group was 30-35 years (18%), with females containing 54%. The most reported symptom was bleeding per rectum (22%). The mean pulse rate was 93.2 bpm, systolic BP 151.5 mmHg, and Hb% 12.11%. Ciprofloxacin (32%) was the most used antibiotic, while Paracetamol and Ibuprofen (50% each) were the preferred analgesics. Post-op complications involved chronic pain (18%) and delayed healing/bleeding (16%). Correlations between complications, age, and sex were weak. Surgery significantly enhanced symptomatic relief (P=0.041).

**Conclusion:** The study has concluded that Ciprofloxacin was the most commonly used post-operative antibiotic, while Paracetamol and Ibuprofen were equally preferred for pain management. The lateral anal sphincterotomy (LAS) is a safe and operative surgical procedure for handling chronic anal fissures, provided that significant symptomatic release and a low recurrence rate.

**Keywords:** Chronic Anal Fissure, Lateral Anal Sphincterotomy, Post-Operative Complications, Coagulation Disorders, Symptomatic Relief.



## Introduction

Chronic anal fissures are a common proctologic disorder that suggestively influences patients' quality of life. [1] These fissures, characterised by a slit in the anoderm, characteristically happen in the posterior midline of the anal canal and are frequently related to pain, bleeding, and sphincter spasm. [2] Different acute anal fissures, which reconcile impulsively or with conventional administration, chronic fissures continue due to decreased wound healing and increased sphincter tone. [3]

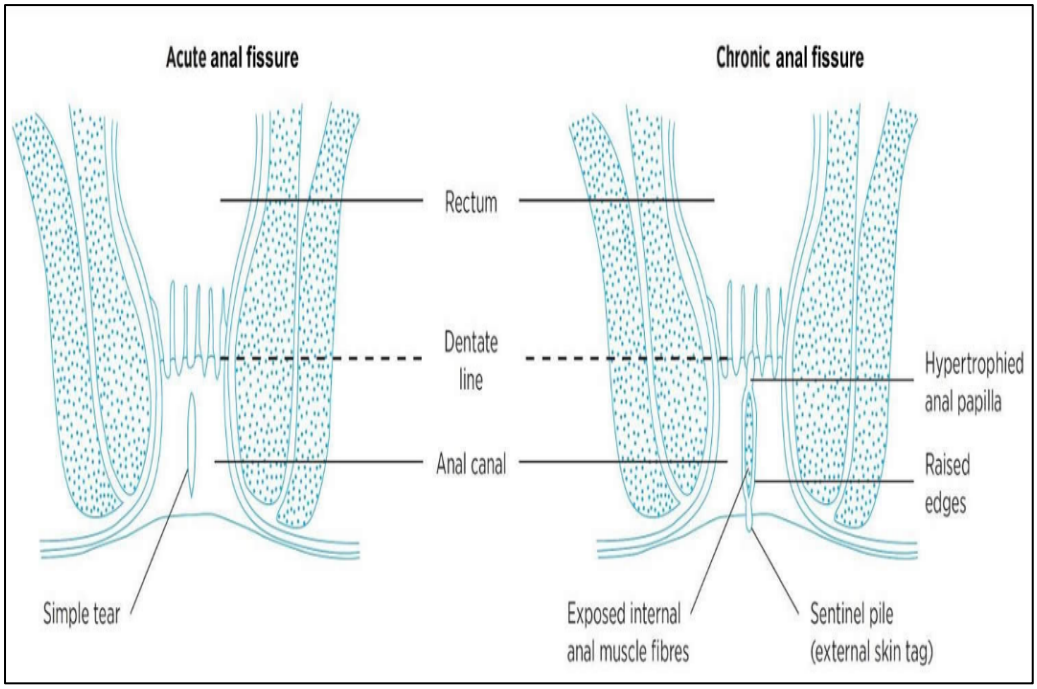


**Figure 1: Typical scenario of Anal fissure**

**Chronic Anal Fissures Pathophysiology:** Chronic anal fissures are mostly produced by continued hypertonicity of the internal anal sphincter, which is important to condense blood flow to the anoderm. [4] This ischemic procedure has consequences in healing, fibrosis, and eventual determination of the fissure. Patients with chronic anal fissures often account for severe pain during and after defecation, occasionally lasting for hours, leading to significant distress and fear of bowel movements. [5] Secondary fluctuations, such as sentinel pile formation, hypertrophied anal papilla, and experience of the internal sphincter fibres, additionally confuse the clinical picture. [6]

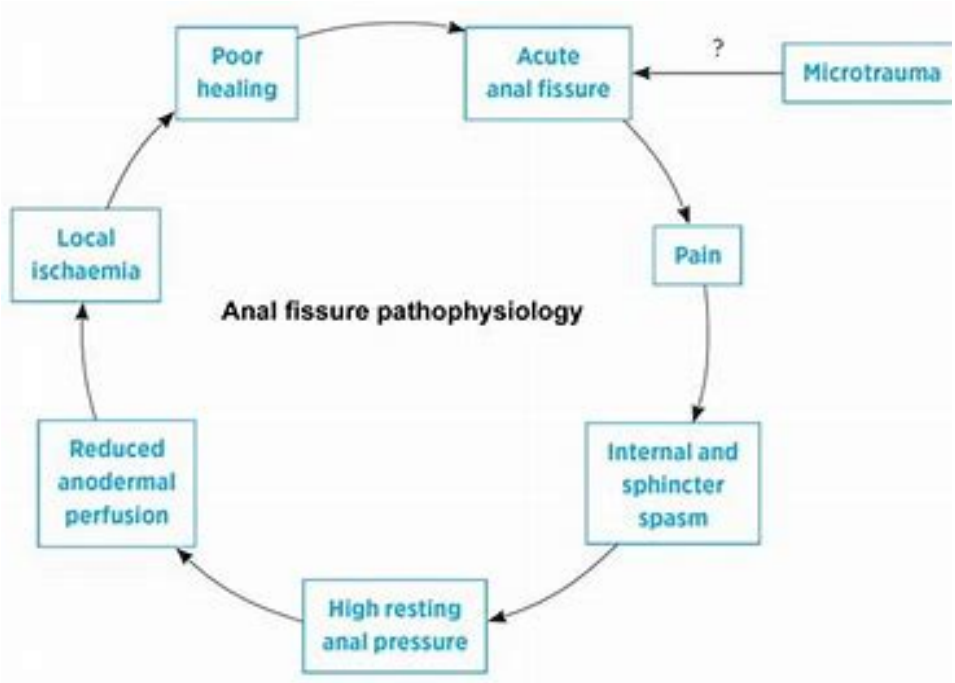


**Figure 2: Pathophysiology of anal fissure (https://healthjade.com/anal-fissure/)**

**Risk Issues and Related Conditions:** Numerous issues underwrite the growth of chronic anal fissures. These contain chronic constipation, frequent anal trauma, hypertonicity of the internal anal sphincter, and circumstances such as inflammatory bowel disease (IBD). [7] In addition,

situations that affect tissue veracity and wound therapeutics, such as diabetes mellitus and immunosuppressive conditions, can cause patients to have chronic fissures. [8]

A predominantly applicable characteristic of chronic anal fissures is the suggestion of liver disease and blood coagulation irregularities. Liver disease, predominantly cirrhosis, plays a critical role in coagulation due to reduced synthesis of clotting factors. Since the liver is responsible for producing key coagulation proteins such as fibrinogen, prothrombin, and factors V, VII, IX, and X, any impairment in its function can lead to an augmented risk of bleeding or thrombosis. [9] Patients with unconventional liver disease frequently present with coagulopathies, leading to abnormal bleeding predispositions, which may confuse surgical interferences such as lateral anal sphincterotomy (LAS). [10]


**Figure 3: Causes and risk factors (https://www.lifelineherbal.com.au/treatments/anal-fissures-fissure-in-ano-ayurvedic-herbal-treatment.html)**

**Coagulation Disorders and Liver Disease:** The liver plays a central role in haemostasis by producing clotting factors and controlling proteins complicated by coagulation and fibrinolysis. [11] Chronic liver disease can disturb this balance, consequential in also a hypercoagulable or hypercoagulable state. Communal coagulation disorders related to liver disease include:

**Prolonged Prothrombin Time (PT) and Activated Partial Thromboplastin Time (aPTT):** Lack of clotting factors due to concentrated hepatic synthesis can lead to augmented bleeding risk. [12]

**Thrombocytopenia:** Regularly pragmatic in liver cirrhosis, thrombocytopenia results from splenic sequestration of platelets and decreased thrombopoietin production. [13]

**Disseminated Intravascular Coagulation (DIC):** A severe significance of liver dysfunction where extensive clotting and fibrinolysis occur instantaneously. [14]

**Hyperfibrinolysis:** Augmented failure of fibrin due to extreme plasmin activity, leading to unnecessary bleeding propensities.

Patients experiencing lateral anal sphincterotomy with fundamental liver disease and coagulation irregularities require careful perioperative assessment to minimise bleeding risks and post-operative difficulties. [15]

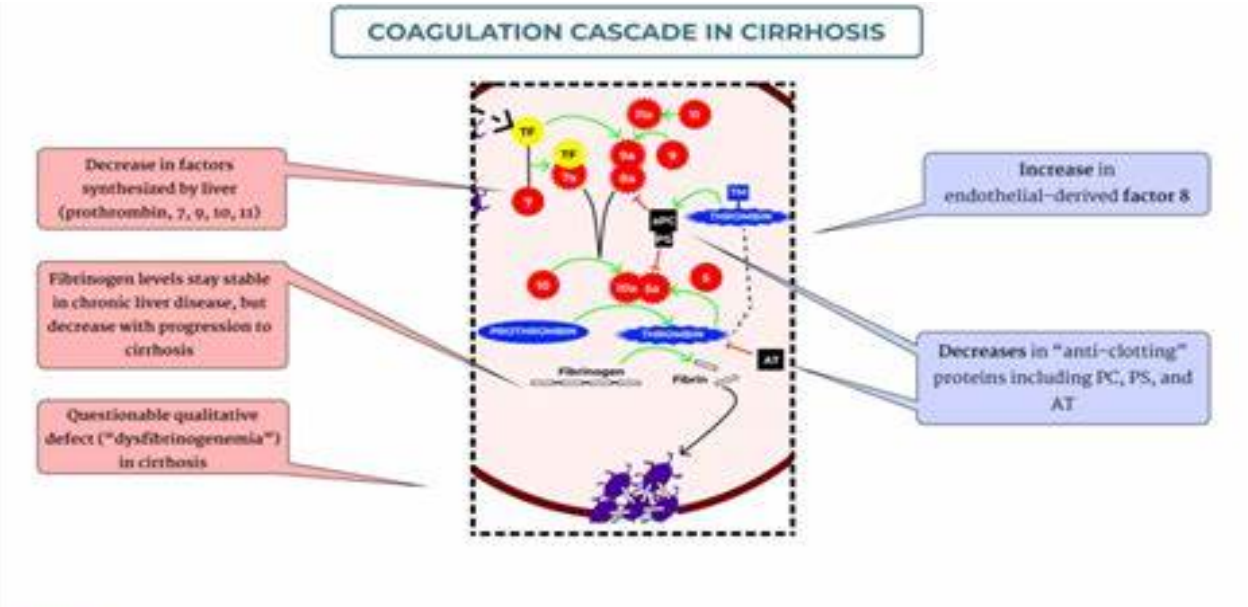


**Figure 4: Coagulation of liver disorder (https://www.aasld.org/liver-fellow-network/core-series/why-series/coagulopathy-liver-disease-part-2)**

**Impression of Coagulation Disorders on Postoperative Consequences:** Separately from liver disease, other coagulation conditions, such as haemophilia, von Willebrand disease, and platelet function irregularities, can affect the healing course of chronic anal fissures. Patients with hereditary or acquired clotting disorders are disposed to continued bleeding and behind-wound healing post-LIS, requiring careful perioperative development. [16]

The role of anticoagulant treatment additionally confuses surgical intervention. Several patients on chronic anticoagulation for circumstances such as atrial fibrillation or deep vein thrombosis involve bridging therapy before LIS to minimise haemorrhagic danger. [17] So, a multidisciplinary method involving proctologists, hepatologists, and haematologists is important in the perioperative administration of these patients.

## Method

This retrospective study analysed data from 50 patients who experienced treatment for chronic anal fissures at Pacific Medical College and Hospital in Bhilon Ka Bedla, Udaipur. Of the study participants, 54.7% were female, with an average age of 36.1 ± 8.96 years. The most usually reported symptoms included pain, bleeding, constipation, itching, and perineal discharge. Assumed its efficiency in pain relief and reappearance preclusion, lateral anal sphincterotomy (LAS) has been recognised as the gold-standard surgical interference for chronic anal fissures.

## Methodology

**Research Design:** This study utilised accessibility specimens to select 50 adult patients identified with chronic anal fissures who met the inclusion criteria. Patients suffering anal pain or rectal bleeding who provided informed consent for lateral anal sphincterotomy were included in the study. Exclusion criteria were clearly defined to remove perplexing factors. They included refusal to agree, use of certain medicines, presence of internal haemorrhoids, inflammatory bowel diseases, rectal fistula, pregnancy, lactation, prior anorectal surgeries, anal sphincter inadequacy, malignancies in the sigmoid colon, rectum, or anus, and ongoing chemotherapy.

Previous surgery, a detailed medical history and a systematic physical examination were shown. Routine laboratory research included haemoglobin levels, total and differential blood counts, erythrocyte sedimentation rate, blood sugar levels, coagulation profiles (bleeding time and clotting time), renal function tests (blood urea and serum creatinine), and urine analysis. In addition, imaging and diagnostic tests such as chest X-ray and electrocardiogram (ECG) were accomplished to assess patient suitability for surgery.

**Procedure for Surgical:** All surgical procedures were accomplished under anaesthesia with patients situated in the lithotomy position. The procedure complicated standard preoperative preparation, including painting, draping, and realising haemostasis. The lateral anal sphincterotomy was accomplished, followed by the submission of an anal gauze pack and dressing. The goal of the technique was to discharge the high anal sphincter pressure, contributively to fissure formation and determining symptoms.

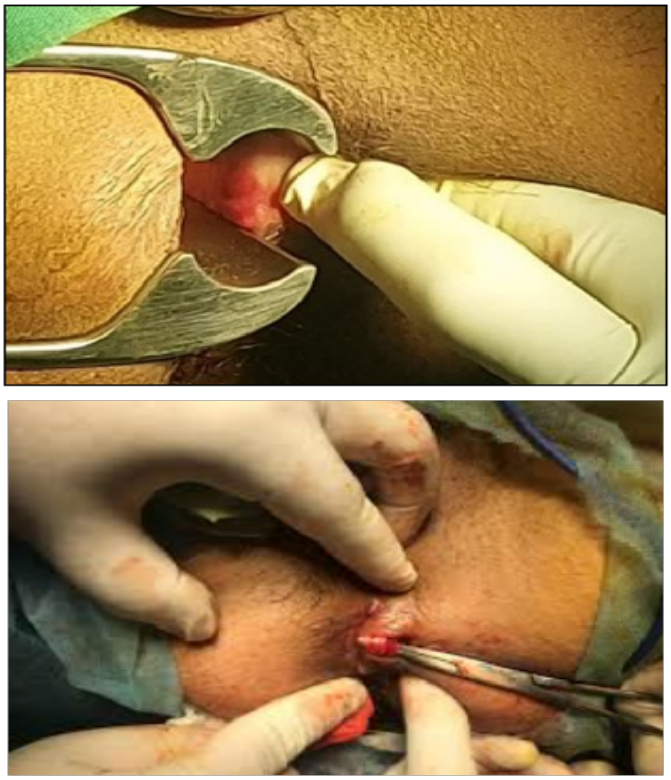

**Figure 5: Photos of patients undergoing LAS**

**Follow-up and Postoperative Care:** Ensuing surgery, patients were thoroughly observed for a period of two to six days for probable difficulties such as bleeding, infection, pain, or incontinence. Systematic follow-ups were arranged to measure wound healing, symptom resolution, and reappearance rates. Pain levels, continency function, and overall patient approval were assessed during these follow-ups.

**Inclusion and exclusion criteria:**

**Inclusion**

- Patients suffering anal discomfort or symptoms related to chronic anal fissure.
- Patients with rectal haemorrhage and pain (streak of blood in stool).
- All chronic anal fissure patients who provide informed consent for lateral anal sphincterotomy.

**Exclusion**

- Who refuses to grant their approval.
- Patient proved to have anorectal malignancy.
- Anti-platelet and anti-coagulant drug patient.
- The patient was found to have internal haemorrhoids.
- The patient is currently undergoing immunotherapy in addition to chemotherapy.
- Patients who are < 18 years of age.
- Colon inflammation disorders.

**Statistical Analysis:** The study used SPSS 27 for effective analysis and employed Chi-square and Fisher's Exact tests to evaluate the statistical significance of proportions. Additionally, the odds ratio was implemented to measure the magnitude of associations between different variables. Data analysis was facilitated using the most modern statistical tools, while Microsoft Word and Excel were employed to generate graphs, tables, and other visual representations.

**Result**

The age group is between 30-35 years, 18% of the total, followed by the 35-40 years group at 13%, and the 40-45 years group at 12%. The smaller age groups, 20-25 years and 25-30 years, represent only 3% and 4%. Regarding gender, females make up a higher proportion at 54%, while males make up 46%. Therefore, the data had representation of females, with a main age demographic in their 30s to 40s. The most common symptom reported is bleeding per rectum (P/R), with 22%. Followed by constipation, which affects 15% of the individuals. Painful defecation is also relatively common, with 13% reporting this issue. Discharge per rectum (P/R) is seen in 10% of individuals, while anal irritation is the least reported, with only 5% experiencing it. The mass per rectum (P/R) is the least common symptom, affecting just 3% of individuals (Table1).

**Table 1: Age and sex distribution of the study**

| **Age Group** | Count (%) |
|---|---|
| 20-25 years | 3 |
| 25-30 years | 4 |
| 30-35 years | 18 |
| 35-40 years | 13 |
| 40-45 years | 12 |
| **Sex** | |
| Male | 46% |
| Female | 54% |
| **Symptom** | |
| Anal irritation | 5 |
| Discharge P/R | 10 |
| Constipation | 15 |
| Painful Defecation | 13 |
| Mass P/R | 3 |
| Bleeding P/R | 22 |

The mean pulse rate is 93.2 beats per minute, reflecting the average heart rate in the sampled population. The respiratory rate is observed at 16.12 breaths per minute, which is the average number of breaths taken per minute. Blood pressure measurements reveal a mean systolic value of 151.5 mmHg and a mean diastolic value of 94.68 mmHg. Haemoglobin percentage (Hb%) is measured at 12.11%, representing the average concentration of haemoglobin in the blood. Total leukocyte counts average 7003.32, and erythrocyte sedimentation rate (ESR) stands at 10.78. In addition, the table includes values for random blood sugar (RBS), blood urea, serum creatinine, bleeding time (BT), and clotting time (CT) (Table 2).

**Table 2: Blood and Cardiovascular Parameters of the Patients**

| **Parameter** | **Mean value** |
|---|---|
| Pulse rate (beats/minute) | 93.2±14.94 |
| Respiratory Rate (times/minute) | 16.12±2.54 |
| Blood Pressure (Systolic), mmHg | 151.5±5.89 |
| Blood Pressure (Diastolic), mmHg | 94.68±2.83 |
| Hb% (%) | 12.11±1.53 |
| Total Leukocyte Count (n) | 7003.32±2114.2 |
| ESR | 10.78±6.2 |
| RBS | 104.36±21.51 |
| Blood urea | 31.12±11.66 |
| Serum creatinine | 0.93±0.24 |
| BT | 4.24±1.57 |
| CT | 11.54±2.22 |

Among the antibiotics used post-operatively, Ciprofloxacin was administered to 16 patients, accounting for 32% of the total, making it the most commonly used antibiotic. Clindamycin was given to 12 patients (24%), while both Cefoxitin and Cefazolin were administered to 11 patients each, representing 22% of the patients, respectively. In terms of postoperative analgesics, both Paracetamol and Ibuprofen were equally used, each being administered to 25 patients, covering 50% of the cohort. This indicates a balanced preference for these two analgesics in managing post-operative pain.

The average duration of postoperative stay in the hospital was 6.90 days, with a standard deviation of 4.12 days, suggesting variability in recovery times among patients. When examining complications, it is notable that 25 patients (50%) experienced no complications post-operatively. However, chronic pain was reported by 9 patients (18%), a significant portion of the cohort dealing with persistent pain. Delayed healing and bleeding were each observed in 8 patients (16%), indicating these complications were relatively common and affected an equal number of patients (Table 3).

**Table 3: Post-operative findings during the follow-up of the patients in this study**

| Parameter | Value | % |
|---|---|---|
| **Post-operative Antibiotic** | | |
| Ciprofloxacin | 16 | 32 |
| Clindamycin | 12 | 24 |
| Cefoxitin | 11 | 22 |
| Cefazolin | 11 | 22 |
| **Post-operative Analgesic** | | |
| Paracetamol | 25 | 50 |
| Ibuprofen | 25 | 50 |
| Postoperative stay (days) | 6.90±4.12 | |
| **Complication** | | |
| No complication | 25 | 50 |
| Chronic | 9 | 18 |
| Delayed Healing | 8 | 16 |
| Bleeding | 8 | 16 |

Ciprofloxacin was associated with 16 patients, with 3 experiencing bleeding, 1 with chronic pain, 3 with delayed healing, and 9 without complications. Clindamycin, Cefoxitin, and Cefazolin also exhibit varying associations with complications. The table's structure facilitates a nuanced understanding of how different antibiotics correlate with distinct post-operative complications. For example, the higher occurrence of bleeding with Ciprofloxacin and chronic pain with Clindamycin is important. This breakdown enhances the comprehension of antibiotic-specific outcomes and provides valuable insights into the potential efficacy and side effects associated with each antibiotic in the post-operative setting (Table 4).

**Table 4: Complications with respect to antibiotics and their respective number of patients**

| Post-operative antibiotics | Bleeding | Chronic Pain | Delayed Healing | No complication |
|---|---|---|---|---|
| Ciprofloxacin | 3 | 1 | 3 | 9 |
| Clindamycin | 2 | 1 | 1 | 8 |
| Cefoxitin | 2 | 2 | 2 | 5 |
| Cefazolin | 1 | 5 | 2 | 3 |
| Total | 8 | 9 | 8 | 25 |

The correlation between Complication and Age is weak, with a Pearson correlation coefficient of 0.138, and the p-value of 0.341 indicates that this relationship is not statistically significant. There was no linear relationship between the occurrence of complications and age in the sample. Similarly, the correlation between Complications and Sex is weak as well, with a coefficient of -0.21 and a p-value of 0.144, which also indicates no significant relationship between complications and sex. The correlation between Age and Sex is also weak (-0.162), with a p-value of 0.262, implying no meaningful association between these two variables in the dataset (Table 5).

**Table 5: Correlation of parameters with respect to each other**

| | | Complication | Age | Sex |
|---|---|---|---|---|
| complication | Pearson Correlation | 1 | 0.138 | -0.21 |
| | Sig. (2-tailed) | | 0.341 | 0.144 |
| | N | 50 | 50 | 50 |
| Age | Pearson Correlation | 0.138 | 1 | -0.162 |
| | Sig. (2-tailed) | 0.341 | | 0.262 |
| | N | 50 | 50 | 50 |
| Sex | Pearson Correlation | -0.21 | -0.162 | 1 |
| | Sig. (2-tailed) | 0.144 | 0.262 | |
| | N | 50 | 50 | 50 |

The study has also found that there is no statistical significance in an increased number of patients with motion frequency (P=0.069) and recurrence of disease (P=0.074). The study has shown that there is a statistically significant number of patients with symptomatic relief after the surgery (P=0.041) (Table 6).

**Table 6: ANOVA findings of the parameters regarding post-operative motion frequency, symptomatic relief and recurrence of the disease with respect to the surgery**

| Parameter | P-value |
|---|---|
| Post-op Motion Frequency (Increased) | 0.069 |
| Post-op Symptomatic Relief | 0.041 |
| Post-op Recurrence of Disease | 0.074 |

## Discussion

Numerous studies have discovered the clinical features of chronic anal fissures and the consequences of lateral anal sphincterotomy. In this segment, the relevant literature emphasises comparable studies (Table 7).

**Table 7: Notable findings of the similar published papers**

| Studies | Important Findings |
|---|---|
| Benoit et al. (2007) [18] | LIS has a therapeutic rate exceeding 90% and suggestively decreases anal undeveloped pressure. Minor incontinence due to the breaking wind happened in 8-15% of the belongings. |
| Schlichtemeier & Engel (2016) [19] | Patients with coagulation conditions had a higher amount of perianal hematoma development and overdue healing post-LIS. |
| Garcia-Aguilar et al. (1996) [20] | Short-term incontinency was common post-LIS, but long-term important incontinency exaggerated < 5% of patients. Personalised sphincterotomy was suggested. |
| Lindsey et al. (2004) [21] | Compared LIS with botulinum toxin injections and anal progression covers. LIS had a higher success rate but, to some extent, increased the risk of incontinence. |
| Higuero et al. (2017) [22] | Patients with diabetes and liver disease skilled continued healing times and increased risk of postoperative impurities. |
| Newman et al. (2019) [23] | A meta-analysis resolved that LIS is superior to conventional events but positions risk for patients with pre-existing comorbidities like IBD and coagulation syndromes. |

**Clinical Features of Chronic Anal Fissures:** A study by Schlichtemeier and Engel (2016) places interest in the importance of identifying fundamental factors that contribute to chronic anal fissures. Their investigation emphasises the role of anal sphincter hypertonicity and the subsequent ischemic cycle important to poor twisted healing. The consequence of conventional management includes dietary modifications, stool softeners, and topical treatments such as glyceryl trinitrate (GTN) and calcium channel blockers. [19]

Additional study by Picciariello et al. (2018) considered the prevalence of chronic anal fissures in patients with instantaneous gastrointestinal disorders such as Crohn's disease and ulcerative colitis. Their results recommend that patients with inflammatory bowel disease have a higher of developing intractable fissures that may require surgical involvement. [24]

**Lateral Anal Sphincterotomy Consequences and Difficulties:** Lateral anal sphincterotomy (LAS) remainders the gold standard surgical treatment for chronic anal fissures, with high achievement charges in indication relief and fissure healing. However, studies have reported fluctuating degrees of post-operative problems, including incontinence, wound infections, and reappearance. [25]

A systematic review by Higuero et al. (2017) evaluated the consequences of LAS in over 1,500 patients. The study found that:

1. The overall fissure therapeutic rate was extraordinarily high, at around 96%.
2. Mild incontinence to flatus was observed in 8% of the cases, but it did not suggestively impression daily events.
3. Major faecal incontinence was tremendously rare, affecting < 1% of patients.
4. Recurrence rates continued comparatively low, fluctuating between 2% and 5%. [22]

The study emphasised the importance of proper patient collection and surgical procedures to minimise difficulties. Patients with fundamental sphincter weakness, previous anorectal surgeries, or comorbid circumstances such as diabetes were at a higher risk of postoperative incontinence. [26]

**Complications of Post-Operative in Patients with Coagulation Illnesses:** Patients with liver disease and coagulation irregularities experiencing LAS present unique tests. Research by Chen et al. (2019) absorbed the perioperative organisation of patients with coagulopathies experiencing proctologic surgical procedures. Their commendations included:

- Preoperative improvement of coagulation limits by means of fresh frozen plasma (FFP) or vitamin K in patients with continued PT/INR.
- Thromboprophylaxis in patients through cirrhosis-associated hypercoagulability.
- Close post-operative intensive care for extreme bleeding or hematoma development. [27]

A retrospective study by Gupta et al. (2020) analysed surgical consequences in patients with liver disease experiencing LAS. They found that patients with cirrhosis had a suggestively higher occurrence of postoperative bleeding (14% vs. 3% in controls) and behind wound healing. These results emphasise the need for individualised perioperative care in this patient inhabitants. [28]

Chronic anal fissures suggestively damage the quality of life and often require surgical interference when traditional treatments be unsuccessful. Lateral anal sphincterotomy is an extremely operative technique but carries risks of difficulties, especially in patients with fundamental circumstances such as liver disease and coagulation irregularities. [29] The presence of coagulopathies requires meticulous preoperative planning, intraoperative haemostasis, and post-operative monitoring to minimise difficulties. [30] Future research should focus on optimising organisation approaches for high-risk patients experiencing anal sphincterotomy to progress surgical consequences and quality of life.

## Conclusion

The study has concluded that Ciprofloxacin was the most commonly used post-operative antibiotic, while Paracetamol and Ibuprofen were equally preferred for pain management. The average hospital stay was approximately 6.9 days, with a significant proportion (50%) of patients experiencing no complications. However, chronic pain (18%), delayed healing (16%), and bleeding (16%) were notable post-operative issues. Ciprofloxacin was more frequently associated with bleeding, while Clindamycin had a higher occurrence of chronic pain. The study found no significant correlation between complications and age or sex. Additionally, while no statistical significance was observed in increased motion frequency or disease recurrence, there was a significant improvement in symptomatic relief after surgery. Post-operative complications were minimal, with a low recurrence rate of 3.6% and a small percentage (1.9%) suffering incontinency (primarily gas or minor spoilage). While some post-operative difficulties, like chronic pain (18%) and delayed healing/bleeding (16%), were observed, a substantial portion of patients (50%) qualified with no difficulties. The optimal of antibiotics, such as Ciprofloxacin, Clindamycin, Cefoxitin, and Cefazolin, and analgesics like Paracetamol and Ibuprofen, played a role in postoperative outcomes. The study also had the importance of careful perioperative management, predominantly in patients with coagulation irregularities.

Therefore, the lateral anal sphincterotomy (LAS) is a safe and operative surgical procedure for handling chronic anal fissures, provided that significant symptomatic release and a low recurrence rate.

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