

Understanding Fistula-In-Ano: Pathophysiology And Clinical Management At Tertiary Care Center.

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Abstract

Fistula in ano is an abnormal communication between anal canal or rectum and perianal skin which causes chronic inflammatory response, explained by Park's Cryptoglandular theory. Main complaint of patient is intermittent or constant discharge. There is a history of pain, swelling, recurrent abscess that ruptured spontaneously, surgically drained. DRE, proctoscopy remains main stay of diagnosis in anorectal fistulas. Surgery is mainstay, aim to cure while preserving sphincter mechanism & prevent recurrence.

Aims And Objectives:

- Clinical Evaluation of Patients presenting with Fistula In Ano.
- Evaluation of Management Protocol of Fistula in Ano in tertiary care.
- To study recurrences of fistula in ano & various Modalities of Treatment.

Method:

Type of study: Descriptive study

Sample size: 80 cases

Period of study: March 2022 – March 2024

Place of study – Tertiary care center

Detailed clinical history, examination of patient was recorded. All investigations relevant to study done in patients. Appropriate surgical management performed. Post operative findings noted.

Results:

Out of 80 cases, mean age - 40 years (range 20-70 yrs), presenting complaints were pain, discharge, itching. Intersphincteric type being most common, the surgical outcome was best achieved by fistulectomy.

Conclusion

We conclude there is a male preponderance of disease and Fistulectomy remains the commonest procedure in our study series. The diagnosis by clinical methods is accurate & cost effective. The conventional technique of surgery is cost effective, has a low learning curve & all patients could have easy access to these techniques.

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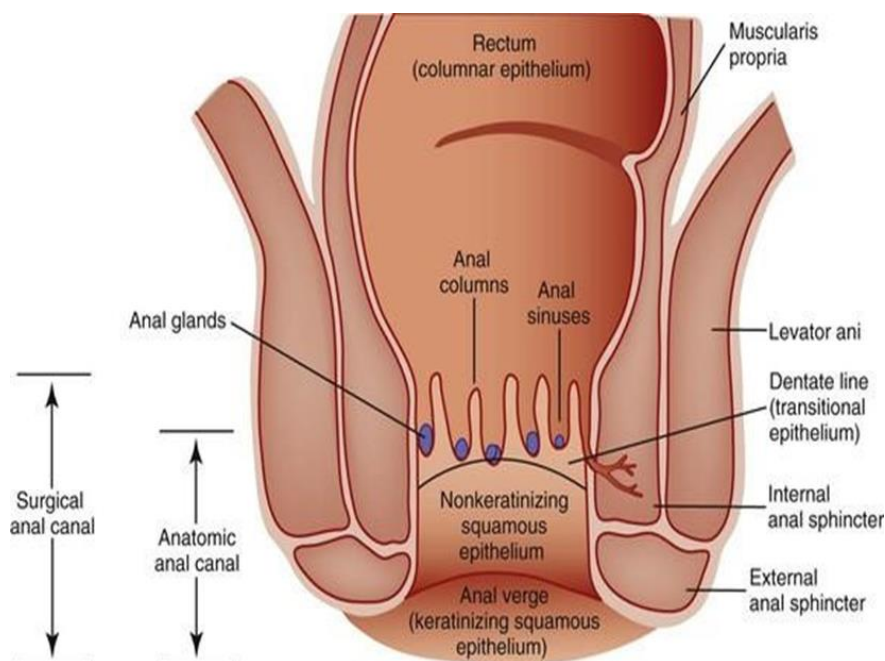
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I. Introduction:

An anal fistula is a tubular passage lined with epithelial tissue that connects the anal canal to the skin around the anus. It typically develops following an anorectal abscess and can be classified based on its relation to the anal sphincters. Despite its benign nature, this condition often causes considerable distress and embarrassment to the patient. This Benign ailment is frequently encountered in the field of surgical specialty. Since more than two thousand five hundred years ago, this condition has been described in the medical literature. It has been estimated that roughly 8.6 cases of fistula in ano occur for every 100,000 people in the community. It is possible to divide fistulae into two categories: simple and complicated. [1-3] Simple fistulae are easy to treat and more prevalent than complex fistula. Complex and recurrent fistulae, on the other hand, frequently manifest with a large number of recurrences, which frequently necessitates multiple treatments. [4] Therefore, it is still difficult to obtain long-term cure for fistula-in-ano with surgical treatment while simultaneously minimising the risk of postoperative sequelae to the patient. Morbidity is exacerbated as a result of repeated interventions since there is a higher chance of injury to the anal sphincter, which can result in anal incontinence that cannot be reversed. [5] Anal incontinence is a significant complication that has the potential to negatively impact the quality of life of patients over the long run. According to the anatomy of fistulae and the intervention that was performed, there has been a significant amount of variation in the rate of incontinence, which can reach up to forty percent. [6].

Nevertheless, the majority of patients experience very slight incontinence after surgery. [7] Furthermore, complex and recurrent fistulae may be connected with a medically curable aetiology such as tuberculosis, Crohn's disease, or actinomycosis.

[8] There have been a number of reports published on the clinicopathological characteristics, classification, therapy, and results of anal fistulae from various countries throughout the world. Among these findings are publications from India.[9- 11]. Additionally, we wanted to describe the clinicopathological characteristics, epidemiology, therapy, and outcomes of fistula in ano in Indian hospitals.



Fistula-in-Ano Overview

A fistula-in-ano is an abnormal tract that forms between the anal canal and the perianal skin. It commonly arises from an anorectal abscess caused by blocked anal glands that become infected. Fistulas are classified based on the extent of their involvement with the anal sphincter muscles, which are crucial for maintaining continence. Although fistula-in-ano is not life-threatening, it significantly impacts a patient's quality of life by causing pain, drainage, and psychological discomfort. Treatment focuses on eliminating the infection and minimizing the risk of incontinence, balancing between eradicating the fistula and preserving sphincter function.

Aetiology

The primary cause of fistula-in-ano is a previous anorectal abscess. Approximately 30-50% of people who undergo drainage for an anorectal abscess will go on to develop a fistula. The condition is more common in men than in women, with an average diagnosis age of 38 years. Additional risk factors include obesity, diabetes, smoking, and a sedentary lifestyle, which can contribute to the development or persistence of fistulas.

Pathophysiology

Fistulas are categorized into two main types based on their complexity:

- **Simple Fistulas:** These involve minimal sphincter muscle and are relatively straightforward to treat with a low risk of incontinence.
- **Complex Fistulas:** These involve more than 30% of the sphincter muscle, can have multiple tracts, or are associated with specific conditions such as Crohn's disease or previous radiation therapy. Treatment is more challenging, as preserving sphincter function becomes crucial to avoid fecal incontinence.

Goodsall's Rule

Goodsall's Rule is a clinical guideline used to predict the internal course of a fistula based on the location of the external opening. According to this rule, if the external opening is located anteriorly, the tract usually takes a straight course to the anal canal. If the external opening is located posteriorly, the fistula is more likely to take a curved path and open in the posterior midline of the anal canal.

Assessment and Imaging

Diagnosing a fistula-in-ano begins with a thorough medical history and a digital rectal examination. For complex cases, examination under anesthesia may be required to get a clear understanding of the fistula’s tract and depth. Imaging techniques, especially MRI, are critical for visualizing complex fistulas and for preoperative planning. Endoanal ultrasonography can also be useful, although it is less detailed compared to MRI.

Medical and Surgical Care

For simple fistulas, lifestyle changes like increased fiber intake, warm sitz baths, and proper anal hygiene may provide symptom relief. However, surgery is often necessary for definitive treatment, especially in complex cases. Common surgical options include:

- **Fistulotomy:** This procedure involves opening the fistula tract to allow it to heal from the inside out. It is effective for simple fistulas with minimal sphincter involvement.
- **Seton Placement:** A seton (a surgical thread) is placed in the fistula tract to facilitate drainage and control infection. This approach is often used for complex fistulas.
- **LIFT Procedure** (Ligation of Intersphincteric Fistula Tract): In this technique, the fistula is closed at the internal opening, preserving sphincter function. LIFT is a promising option for complex fistulas.
- **Fibrin Glue or Plugs:** These methods involve filling the fistula tract with a biological material to encourage healing. While minimally invasive, they have a lower success rate.

Complications and Recurrence

Protecting the anal sphincter during treatment is essential to avoid complications like incontinence. Recurrence rates vary significantly based on factors like the height of the fistula tract, the patient’s body mass index (BMI), smoking habits, and prior surgeries. Higher, more complex fistulas have an increased risk of recurrence, making long-term management essential.

General Etiology	Specific Etiology	Microbiology
1) Anorectal Disease	Crohn’s Disease , Ulcerative colitis	Colonic flora
2) Colonic	Diverticular disease	Colonic flora
3) Skin disease	Pilonidal sinus Hiradenitis Suppurativa Sebaceous cyst Pyoderma (localised)	Skin Flora
4) Specific infections	Tuberculosis Chancroid Gonorrhoea Infected bartholin’s gland Prostatitis Actinomycosis	Mycobacterium Typhi Haemophilus Ducreyi Neisseria Gonorrhoea
5) Trauma	Penetrating injury (episiotomy, injury during rectal surgery) Ingested foreign body	
6) Malignancy	Anal carcinoma , Lymphoma , dermoid , Anal colloid adenocarcinoma	

II. Material And Methods:

Study site: This study was conducted among patients attending the OPD / IPD of General Surgery Department, School of Medical Science and Research, Sharda University, Greater Noida.

Study design: Observational study

Study duration: March 2022 to March 2024

Sample size: All patients presenting with Fistula in Ano to Sharda hospital.

Inclusion:

- All patients presenting with Fistula in Ano.
- Age >18 years

Exclusion:

- Age <18 yrs
- Patients not willing to participate in the study.

All the patients fulfilling inclusion criteria will be included in the study after obtaining the informed consent. The Duration of Fistula in ano, previous history of perianal abscess, history of surgical intervention to be documented Initial investigation for examination is Digital rectal examination followed by Proctoscopy with methylene blue to confirm position of internal opening.

Radiological imaging – MRI fistulogram for identification of tract size, location, extent.

Investigation / intervention needs patients or human subjects/materials: Yes
Does the study need animals or materials from animals? No

Questionnaire study: Yes

Ethical consideration: Ethical clearance will be obtained from the institutional ethics committee prior to start of the study.

Informed consent: Patients or attendant will be expressing the willingness by signing predesigned informed consent form.

III. Results:

An observational study was carried out from March 2022 to March 2024 in the Department of General Surgery. The patients belonged to various surgical units in Department of general surgery, Sharda Hospital, School of Medical sciences and research and full details of the patient

AGE Distribution

AGE GROUP	NUMBER OF PATIENTS	PERCENTAGE
18 – 30 YRS	17	21.25%
31- 40 YRS	28	35.00%
41 – 50 YRS	24	30.00%
51 – 60 YRS	8	10.00%
61 – 70 YRS	2	2.50%
> 70 YRS	1	1.25%
TOTAL	80	100%

The mean age in this study was 36.51 +/- 8.99 years, with the most common age group being between 31-40 years. The main reason for this is the occupation, as this is the working class, and the area that contains most sweat and soiling.

The most common age group was 31-40 years, which corroborates with the epidemiology data available from India. In 80 cases, 64 were males and 16 were females, with a ratio of males to females is 3.375:1.

Gender Distribution

Gender	Frequency	Percentage
Male	64	77.14
Female	16	23.86

Presenting Complaints

Complaints	Number of patients	percentage
Unexplained Pain	35	43.75%
Discharge	12	15.00%
Bleeding	7	8.75%
Itching	16	20.00%
Swelling	6	7.50%
Constipation	4	5.00%
Total	80	100

Types Of Fistula

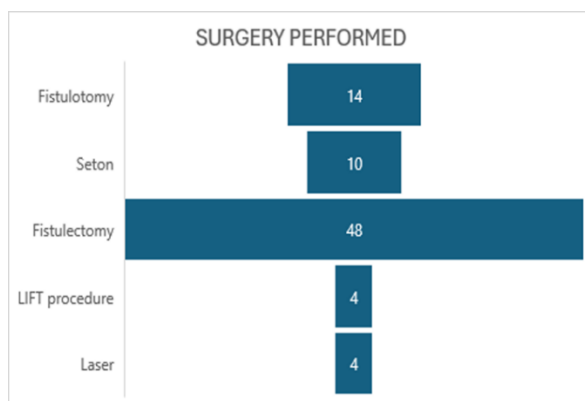
Type Of Fistula	Frequency	Percentage
Superficial	5	6.25%
Transphincteric	18	22.5%
Intersphincteric	42	52.00%
Supralevator	5	6.25%
Extrasphincteric	10	12.50%

The most common type of fistula is the intersphincteric type, as observed in more than half the population.

Surgery Performed

Types Of Surgery	Frequency	Percentage
Fistulotomy	14	17.14%
Seton	10	8.50%
Fistulectomy	48	70%
Lift Procedure	4	4.28%
Laser Excision	4	5%

The most common surgery done is fistulectomy, followed by fistulotomy.



Examination Of Fistulous Tract

In majority of the cases the fistulous tract was seen externally, and in most cases it was confirmed by palpation.

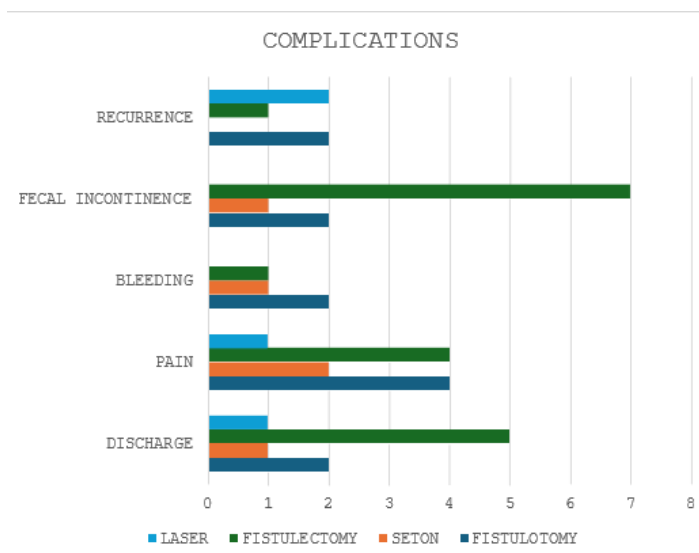
Opening Of Fistulous Tract		Frequency	Percentage
External		78	98%
Internal	Inspected	15	18%
	Palpated	40	50%
	Both	20	25%
	Neither	5	6%

In half the patients, they were discharged from the hospital in a week.

Hospital Stay	Sum Total	Fistulectomy	Fistulotomy	Seton	Laser Excision	Lift	Percentage
3 Days	34	8	14	2	1	0	42.50%
1 Week	46	25	10	2	2	3	57.50%
> 1 Week	5	2	1	1	1	0	6.25%

Complications	Fistulotomy	Seton	Fistulectomy	Laser
Discharge	2	1	5	1
Pain	4	2	4	1
Bleeding	2	1	1	0
Fecal Incontinence	2	1	7	0
Recurrence	2	0	1	2
Total	10	5	17	4

Patients were followed up after 1 week, 1 month and 3 months. Recurrence was noted only in 2 patients at the end of the 3 months. It was observed that there was no significant difference in the outcomes of the patients between different surgical modalities (P=0.0831)



IV. Discussion:

This prospective observational study investigated the demographics, clinical presentations, types, surgical interventions, and outcomes for patients with fistula-in-ano undergoing surgery at a single institution.

AGE

The mean age of patients was 36.51 ± 8.99 years, with the most common age group being 31-40 years, consistent with the findings by Shivakumar et al. (12), who reported a similar age group and mean age of 39.5 years. However, a study by Andreao et al. (13) on 65 patients found a higher mean age of 49.7 years ($SD \pm 15.9$).

GENDER

A male predominance (3.3:1) was noted in this study, aligning with Shivakumar et al.'s (12) findings, where men constituted 81.3% of cases. Similarly, Kim et al. (34) reported a stronger male predominance with a male-to-female ratio of 4.6:1, indicating a slightly higher male preponderance than our study.

PRESENTING COMPLAINTS

The primary symptoms reported were unexplained pain and perianal itching. Andreao et al. (13) also observed that patients frequently presented with perianal pain or discharge, with a mean symptom duration of 11.7 months, ranging from one week to 12 years.

TYPE OF FISTULA IN ANO

Intersphincteric fistulas were most common in this study. By contrast, Yuri et al. (12) found transsphincteric fistulas to be more prevalent (38.7%), followed by intersphincteric (36.6%). Abbas et al. (15) observed that 94.4% of their patients had a single fistula, most commonly low transsphincteric (46.9%), with a minor percentage presenting with suprasphincteric fistulas (6.1%) and horseshoe configurations (10.1%).

SURGERY PERFORMED

Fistulectomy was the most common surgical procedure, followed by fistulotomy. Ligation of the intersphincteric fistula tract (LIFT) was performed in a small subset of cases. Andreao et al. (13) reported 65 fistulotomies (70%), 13 mucosal advancement flaps (14%), 7 anal fistula plugs (8%), and 8 cutting-seton operations (8%). Farag et al. (16) found that aggressive fistulotomy increased incontinence risks, while inadequate care led to recurrence. Our study indicated a recurrence in 16 patients and incontinence in 22 out of 96 patients post-fistulotomy, with similar complication rates across fistulectomy and seton implantation procedures.

COMPLICATIONS

Seyfried et al. (17) reported a lower recurrence rate for fistulectomies combined with primary sphincter reconstruction. Roig et al. observed that of 75 patients treated with fistulectomy and sphincter reconstruction, 10.6% developed incontinence, and 26.6% experienced recurrence. In this study, 113 patients received cutting setons, with 23.2% requiring incontinence treatment postoperatively, aligning with Vatansev et al. (18), who noted a 15.6% incontinence rate with cable tie cutting setons.

ALTERNATIVE TECHNIQUES

Anal fistula plugs, initially used in our study, were later abandoned due to inconsistent healing rates, as noted by Garg et al. (19) and Omar et al. (20). LIFT procedures had a recurrence rate of 9.7% but showed improved outcomes with modified methods (21).

ADDITIONAL CONSIDERATIONS

Both postoperative incontinence and recurrence rates were influenced by fistula complexity and muscle loss, consistent with findings from Visscher et al. (22), who reported greater incontinence and impaired quality of life post-surgery for complex fistulas. Routine postoperative drainage and abscess care with sodium hypochlorite solution was implemented to prevent complications (23). For Crohn's disease patients, Hermann et al. (24,25) recommended combining fistulotomy with pharmacological agents such as azathioprine or biologics like infliximab, enhancing outcomes in cases with complex anal fistulas.

V. Conclusion:

This study assessed the clinical and surgical outcomes of Fistula-in-ano. We observe that fistulectomy was the most common procedure performed in the study population, with a male predominance. Most of the patients had minor complications such as discharge and pain, which resolved by the 3rd month follow-up. Seton is procedure of choice in high anal fistula.

Fistulotomy is associated with slightly high recurrence but low chances of anal incontinence as compared to fistulectomy. Sphincter sparing options continue to evolve and continued review of new techniques is important to give best possible treatment. It is necessary for surgeons to stay updated on new sphincter sparing options so that patients can be given opportunity to a best quality treatment. The study concludes that most of the patients presenting with Fistula in Ano must undergo detailed evaluation to identify the cause, location and size of tract. Hence MRI Fistulogram is a must to delineate the findings along with clinical examination. Thereby, deciding the surgery of choice for the type of fistula in Ano. The systematic Approach to diagnose and treat Fistula in ano in a tertiary care center has been thoroughly studied in this study.

References:

- [1] Nelson RI, Abcarian H. Epidemiology, Incidence And Prevalence Of Fistula In Ano. In: Anal Fistula Edn: Springer; 2014: 1–3. [Google Scholar]
- [2] Jayarajah U, Wickramasinghe Dp, Samarasekera Dn. Anal Incontinence And Quality Of Life Following Operative Treatment Of Simple Cryptoglandular Fistula-In- Ano: A Prospective Study . BMC Res Notes 2017; 10: 572. [Pmc Free Article] [Pubmed] [Google Scholar]
- [3] Jayarajah U, Samarasekera Dn. Predictive Accuracy Of Goodsall’s Rule For Fistula-In-Ano. Ceylon Med J 2017; 62: 97–99. [Pubmed] [Google Scholar]
- [4] Bubbers Ej, Cologne Kg. Management Of Complex Anal Fistulas. Clin Colon Rectal Surg 2016; 29: 43–49. [Pmc Free Article] [Pubmed] [Google Scholar]
- [5] Malik A, Nelson R. Surgical Management Of Anal Fistulae: A Systematic Review. Colorectal Dis 2008; 10: 420–430. [Pubmed] [Google Scholar]
- [6] Damon H, Guye O, Seigneurin Aet Al. Prevalence Of Anal Incontinence In Adults And Impact On Quality-Of-Life. Gastroenterol Clin Biol 2006; 30: 37–43. [Pubmed] [Google Scholar]
- [7] Malouf Aj, Buchanan Gn, Carapeti Eet Al. A Prospective Audit Of Fistula-In-Ano At St. Mark’s Hospital. Colorectal Dis 2002; 4: 13–19. [Pubmed] [Google Scholar]
- [8] Jayarajah U, Almeida I, Samarasekera D. The Yield Of Routine Histopathology In Fistula-In-Ano. Sri Lanka Journal Of Surgery 2020; 38: 34–41. [Google Scholar]
- [9] Garg P. Is Fistulotomy Still The Gold Standard In Present Era And Is It Highly Underutilized?: An Audit Of 675 Operated Cases . Int J Surg 2018; 56: 26–30. [Pubmed] [Google Scholar]
- [10] Bolshinsky V, Church J. Management Of Complex Anorectal And Perianal Crohn’s Disease. Clin Colon Rectal Surg 2019; 32: 255–260. [Pmc Free Article] [Pubmed] [Google Scholar]
- [11] Abbas Ma, Lemus-Rangel R, Hamadani A. Long-Term Outcome Of Endorectal Advancement Flap For Complex Anorectal Fistulae. Am Surg. 2008 Oct;74 (10):921-4. [Pubmed: 18942614]
- [12] Shivakumar V, Jayarajah U, Samarasekera Dn. Characteristics And Post- Operative Outcomes Of Surgery For Fistula-In-Ano Managed At A Tertiary Care Hospital In Sri Lanka: A Retrospective Study. J Int Med Res. 2023;51(9):30006 05231194516. Doi:10.1177/03000605231194516
- [13] Andreou, C., Zeindler, J., Oertli, D. Et Al. Longterm Outcome Of Anal Fistula – A Retrospective Study. Sci Rep 10, 6483 (2020). <https://doi.org/10.1038/S41598-020-63541-3>
- [14] Abbas Ma, Jackson Ch, Haigh Pi. Predictors Of Outcome For Anal Fistula Surgery. Arch Surg. 2011;146(9):1011–1016. Doi:10.1001/Archsurg.2011.197
- [15] Farag Afa, Elbarmelgi My, Mostafa Met Al. One Stage Fistulectomy For High Anal Fistula With Reconstruction Of Anal Sphincter Without Fecal Diversion. Asian J Surg 2019; 42: 792–796. [Pubmed] [Google Scholar]
- [16] Seyfried S, Bussen D, Joos Aet Al. Fistulectomy With Primary Sphincter Reconstruction. Int J Colorectal Dis 2018; 33: 911–918. [Pubmed] [Google Scholar]
- [17] Roig J, García-Armengol J, Jordán Jet Al. Fistulectomy And Sphincteric Reconstruction For Complex Cryptoglandular Fistulas. Colorectal Dis 2010; 12: E145–E152. [Pubmed] [Google Scholar]
- [18] Vatansev C, Alabaz Ö, Tekin Aet Al. A New Seton Type For The Treatment Of Anal Fistula. Dig Dis Sci 2007; 52: 1920–1923. [Pubmed] [Google Scholar]
- [19] Chuang-Wei C, Chang-Chieh W, Cheng-Wen Het Al. Cutting Seton For Complex Anal Fistulas . Surgeon 2008; 6: 185–188. [Pubmed] [Google Scholar]
- [20] Garg P, Kaur B, Goyal Aet Al. Lessons Learned From An Audit Of 1250 Anal Fistula Patients Operated At A Single Center: A Retrospective Review. World J Gastrointest Surg 2021; 13: 340–354. [Pmc Free Article] [Pubmed] [Google Scholar]
- [21] Omar W, Alqasaby A, Abdelnaby Met Al. Drainage Seton Versus External Anal Sphincter–Sparing Seton After Rerouting Of The Fistula Tract In The Treatment Of Complex Anal Fistula: A Randomized Controlled Trial. Dis Colon Rectum 2019;62: 980–987. [Pubmed] [Google Scholar]
- [22] Gendia Am, Abd-Errazik Ma, Hanna Hh. Ligation Of The Intersphincteric Fistula Tract Procedure And Its Modifications. Journal Of Coloproctology 2018; 38: 324–336. [Google Scholar]
- [23] Visscher A, Schuur D, Roos Ret Al. Long-Term Follow-Up After Surgery For Simple And Complex Cryptoglandular Fistulas: Fecal Incontinence And Impact On Quality Of Life . Dis Colon Rectum 2015; 58: 533–539. [Pubmed] [Google Scholar]
- [24] Włodarczyk M, Włodarczyk J, Sobolewska-Włodarczyk Aet Al. Current Concepts In The Pathogenesis Of Cryptoglandular Perianal Fistula. J Int Med Res 2021; 49: 0300060520986669. [Pmc Free Article] [Pubmed] [Google Scholar]
- [25] Schwartz Da, Pemberton Jh, Sandborn Wj. Diagnosis And Treatment Of Perianal Fistulas In Crohn Disease. Ann Intern Med 2001; 135: 906–918. [Pubmed] [Google Scholar]
- [26] Hermann J, Eder P, Banasiewicz Tet Al. Current Management Of Anal Fistulas In Crohn’s Disease. Prz Gastroenterol 2015; 10: 83–88. [Pmc Free Article] [Pubmed] [Google Scholar]