



## Breaking Barriers in Fstistula Management: The Power of DLPL Laser and Ayurveda Harmony

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**ABSTRACT:** Background: Anal fistula is a tract between anal canal and perianal skin which often arises from abscesses and can spread in various directions. It becomes complicated if associated with certain comorbidities like Diabetes mellitus. Fourniers gangrene is a complication associated with scrotal fistula. In Ayurveda it is referred to as *Bhagandara*. The surgical approach aims to be minimally invasive and reduce the chances of recurrence employing techniques such as fistulotomy, *Kshar Sutra* ligation and laser ablation which has gained popularity for treating fistulas. Case: A 51 year old male patient presented with a swelling in the scrotum along with severe pain at perianal region extending up to base of the scrotum, that was persistent for 5 days, which made sitting and walking difficult for him. Due to recurrent symptoms following surgery for perianal abscess four months prior, he was admitted for treatment.. He was managed and treated of recurrent fistula that originated from scrotal abscess. Discussion: This was *Unmargi Bhagandara* in which patient faced a challenge as he suffered with diabetes and severe pain. The patient was offered an approach of combining surgical techniques with *Ayurvedic* principles utilizing specific medications and innovative pain management methods which resulted in significant improvements. Conclusion: The remarkable outcome of this case truly demonstrates the results. It wasn't, about resolving the surgical issue; it also had a positive impact, on the overall wellbeing of the patient. This exemplifies how practicing *Ayurveda* entails adopting an integrated approach to successfully treat and care for patients.

**KEYWORDS:** Scrotal fistula, Fournier's gangrene, Laser Surgery, *Panchvalkala* ointment, *Murivenna Tail*, *Dhamasa* suppository, recurrent fistula,

### INTRODUCTION

A fistula is described as a connection, between the cavity of one organ to another or between an organ and the outer surface of the body or even between blood vessels. The term "fistula" has its roots in words, like flute, pipe, and tube. It can occur naturally from birth or be acquired later in life. <sup>(1)</sup>

Fistula, around anus is a condition complex. It is observed in 26-38% of cases where there is an abscess, in the region. This condition is characterized by discharge or intermittent pain caused by the recurring abscess and occasional self-drainage. <sup>(2, 3)</sup> Fistula, in ano is commonly found in men than, in women. <sup>(4,5)</sup> In the majority of instances men are found to be involved in 70% of cases with the majority of these cases occurring

between the third and sixth decade of life. <sup>(13)</sup> In the majority of instances a fistula originates, from sources resulting in the formation of an abscess, during the stage and later progressing into a chronic fistula. <sup>(6,7)</sup> The abscesses hold bacteria from the intestines. The infection can spread in different ways downwards, sideways or upwards as to the area between the anus and genitals; through the anal sphincter muscle to a space near the pelvis bone; in the area between sphincters to an area, above them. From these spaces infection can move forward towards the scrotum causing an "Ano Scrotal fistula." <sup>(8)</sup> A fistula in ano is considered complex if it has characteristics; a passage that spans 30-50% of the sphincter being positioned towards the front, in females having multiple passages recurring frequently existing alongside incontinence issues, a history of local radiation treatment or being associated with Crohn's disease. <sup>(9, 10)</sup>

Fourniers gangrene, which is a complication of fistula was first described by Jean Alfred Fournier in 1883. It is an infection that causes necrotizing fasciitis in the genital or perianal regions. The condition occurs as a result of thrombosis leading to gangrene of the skin and damage, to the perineal and genital organs. <sup>(15, 16)</sup> Severe infection caused by a combination of types of bacteria, in the gut can lead to tissue damage below the skin specifically affecting the scrotum.

*Bhagandara* referred as fistula in ano, because it tends to come frequently. Ayurveda considers *Bhagandara* as one of the eight major diseases known as *Ashta Mahagada*. <sup>(11)</sup> An increasing number of people are experiencing diseases in today's era mainly due, to a sedentary lifestyle and other factors. *Bhagandara*, which refers to the condition affecting the area around the anus and extending towards the genitalia, in the region is formed by combining the words "*Bhaga*" and "*Darana*." <sup>(12)</sup> *Bhagandara's* growth is distinguished by an opening that surrounds *Guda Pradesh* with painful discharge. Surgery is the only modality for effective treatment and management of fistula in ano. The main target in surgical management of fistula is to heal with minimal invasion and least chances of re-occurrence. Different surgical modalities are available in present time which are used by surgeon's in management of fistula such as <sup>(17)</sup> Fistulotomy, Fistulectomy <sup>(24)</sup>, *Kshar sutra* ligation, Ligation of Intersphincteric Fistula Tract (LIFT) <sup>(18,25)</sup> Anal fistula plug repair (AFP) <sup>(19)</sup>, Seton technique <sup>(23)</sup>, Video assisted anal fistula track ligation (VAAFT) <sup>(20)</sup>, Distal ligation and proximal laser (DLPL). Now a day LASER is also an emerging technique which is used to treat various types of diseases, including fistula-in-ano. <sup>(21)</sup> LASER have been used as surgical tools for anal diseases for the past four decades <sup>[26]</sup> with the first report of a CO<sub>2</sub> laser in 1981 <sup>[27]</sup> being used to treat three cryptogenic anal fistulae by coring out the fistula track followed by a 2001. Saudi Arabian study reporting six anal fistula cases treated with a KTP solid-state laser combined with fibrin glue instillation. Until recently, the lasers used for this procedure radiated linear energy but now radial LASER beams are also available for better management of fistula in Ano. LASER ablation of fistula tract is a safe, effective, sphincter-preserving therapy <sup>(22)</sup> that can be successfully performed by surgeons now a day. <sup>(14)</sup>

## CASE SUMMARY

A male patient, aged 51 arrived at the Shalya Tantra outpatient department. He complained of swelling in the part of the scrotal wall for the past 5 days. The patient also experienced pain, in the scrotal region particularly along the midline, which made it difficult for him to sit and walk properly for the last 3 days. Additionally, he reported feeling weak for a month. The patient had previously undergone surgery for incision and drainage of perianal abscess 4 months back but experienced recurring symptoms in the past 5 days. Consequently, he was admitted to the ward of for further management.

**MEDICAL HISTORY-** He didn't have any history of hypertension, tuberculosis, bronchial asthma, chronic kidney disorder, diabetes mellitus, but when he reported in OPD his random blood sugar was significantly

raised. After his fasting and post meal blood sugar with 4 hourly RBS charting was done and he was newly diagnosed with diabetes mellitus.

**SURGICAL HISTORY-** He had surgical history if incision and drainage of scrotal abscess 4 month back.

**FAMILY HISTORY-** He had not any specific family history.

**PERSONAL HISTORY**

Parameter	Status
Appetite	Normal
Diet	Vegetarian
Bowel	Regular, no constipation
Urine	Normal voiding (5-6 times a day)
Sleep	Disturbed
Addictions	None
Blood Transfusion History	None

General examination on admission

Parameters	Status
Blood Pressure (BP)	130/90 mm of Hg
Pulse Rate	88/min
Temperature	98.8°F
Respiration Rate	18/min
Pallor (Pale Skin)	Absent
Icterus (Jaundice)	Absent
Cyanosis (Bluish Skin)	Absent
Clubbing (Nail Deformity)	Absent
Lymphadenopathy (Enlarged Lymph Nodes)	Absent
Edema (Swelling)	Present (Base of Scrotum)

**Haematological test**

Test	Result
Hemoglobin (Hb)	12.3 gm%
Total Leukocyte Count (TLC)	10,600/cu mm
DLC:	
- Neutrophils (N)	76%
- Lymphocytes (L)	15%
- Eosinophils (E)	2%
- Monocytes (M)	7%
Total Red Blood Cells (RBC)	4.05 million
Platelets	201,000/cumm
Erythrocyte Sedimentation Rate (ESR)	32 mm/1st hour
Random Blood Sugar (RBS)	150 mg %
Liver Function Tests (LFT):	
- Total Bilirubin (T)	0.4

- Direct Bilirubin (D)	0.10
- Indirect Bilirubin (I)	0.30
- SGOT	37
- SGPT	27
Kidney Function Tests (KFT):	
- Serum Urea	51
- Serum Creatinine	1.10
Urinalysis:	
- Appearance	Clear
- Pus Cells	8-10
- Calcium Oxalate Crystals	8-10
- Epithelial Cells	4-5
- Bacteria	Present
- Glucose	Present (++)
- Albumin	Absent
HIV	Negative
Hepatitis B Surface Antigen (HbSAg)	Non-Reactive

### LOCAL EXAMINATION

Local examination was done after obtaining the patients consent and providing them with information, about the procedure. The patient was given lithotomy position ensuring exposure of the anal regions while respecting their privacy and dignity.

During the examination of the area, it is noticed significant findings. Firstly, there was a scar from a previous incision and drainage at the left scrotal base indicating that there had been prior surgical intervention in that area. Additionally, there was swelling at the base of the scrotum accompanied by signs of inflammation such as redness, in the surrounding area.

During the examination on palpation the patient experienced tenderness, in the area around the scrotum suggesting discomfort or sensitivity when pressure was applied. Furthermore a firm or hardened spot was felt at the part of the scrotum, which could indicate changes in tissue or the existence of a medical issue. These collective findings from both inspection and physical examination necessitate a medical assessment and possibly further diagnostic tests to ascertain the cause and determine an appropriate course of action, for addressing the concern related to the scrotum.



**Fig:1- Local Examination of recurrent Scrotal fistula-Day0**

## Treatment planned

The patient at admission showed a S. Urea level of 51 which required the administration of pre-operative medications. The urine analysis revealed urine with the presence of 8-10 pus cells, calcium oxalate crystals 4-5 epithelial cells and bacteria. As a result treatment was necessary. The treatment plan involved administering fluids such, as RL 500ml, DNS 500ml and NS 500ml. Antibiotics like Inj Taxim 1 gm IV BD af and Inj Pan 40 mg IV OD bf were also included in the regimen. Additionally oral medications prescribed were Tab *Chandraprabha vati* 2 BD Tab *Trifala Guggul* 2 BD af and *Trifala Churna* (5gm) with water, at bedtime. Before the procedure the patient was NBM (nil by mouth) since midnight. The medical team, which includes the surgeon, anesthetist and OT sister, has been informed about the patient's condition. To ensure sensitivity the patient received an injection of 0.5 cc of Xylocaine and an intramuscular injection of 0.5 cc of TT. Enemas were also given during midnight and early morning to prepare for the procedure.

## Operative procedure

**Clinical Diagnosis-** Scrotal Abscess with fistula

**Final Operative Diagnosis-** Recurrent Scrotal Abscess with fistula

**Procedure-** I & D with DLPL (Distal ligation proximal laser)

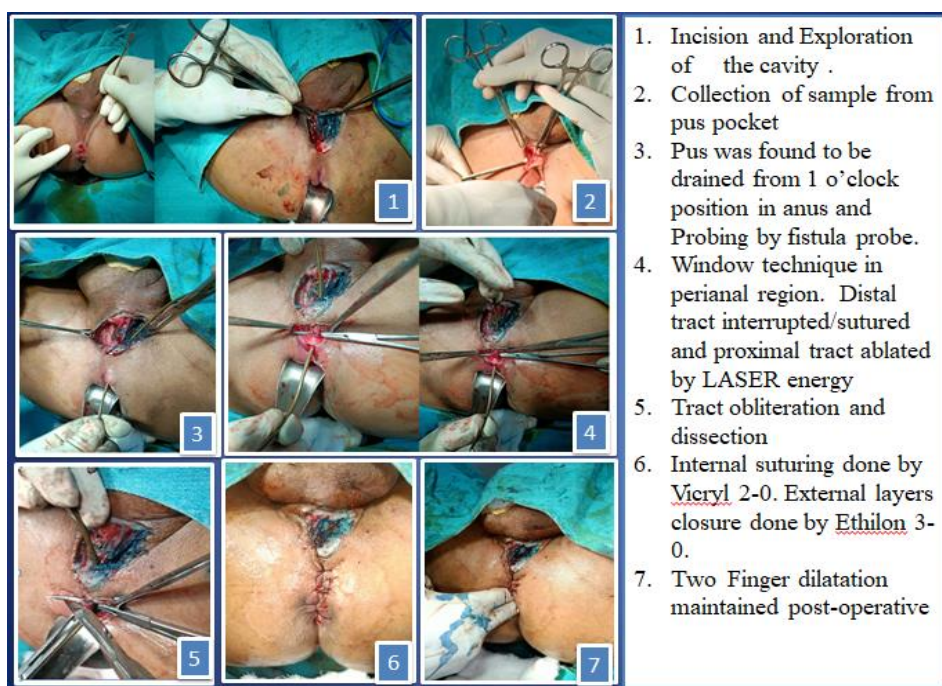
**Type of Anaesthesia-** Spinal

**Intraoperative Complications-** not any

**Specimens-** Excised Fistula tract sent for histopathology

## Procedure-

- Lords Anal Dilation was performed
- Exploration of the cavity on the left and right side of the raphe was conducted. Multiple pus pockets were drained using Hilton's method.
- Probing from inside the cavity towards anus revealed an opening of fistula at 1 o'clock position.
- Window technique exploration of the tract.
- Distal tract interrupted and sutured & proximal tract ablated by LASER energy (The 360° FiLaC) by continues retracting the LASER fibre Distal Tract at the rate of 1cm per 3 seconds. Window closure done in layers.



**Fig 2: Intraoperative Pictures:**

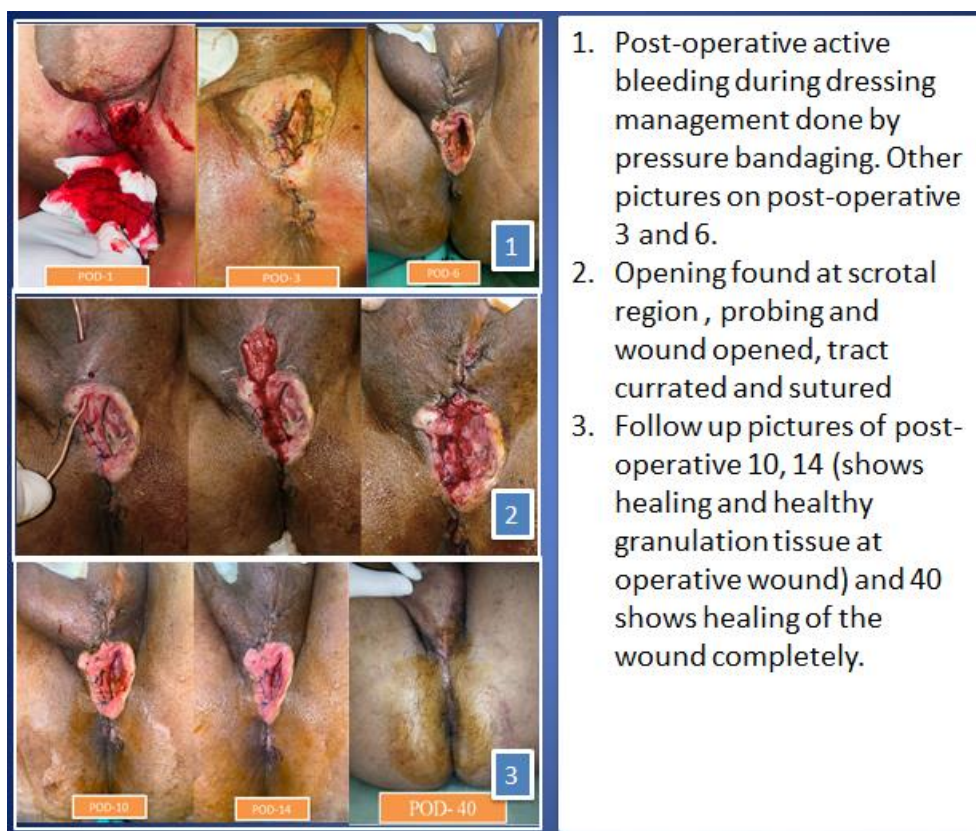
**Post operative instructions and management:** After the procedure the patient was instructed to follow care measures. These measures included not consuming any food or drink for 4 hours to aid in recovery keeping their head low position, for 12 hours and continuously monitoring their blood pressure, pulse rate. temperature and oxygen saturation.

To control infection the patient was given medications as

1. Inj Cefixime 1gm IV every 12 hours.
2. Inj Pantoprazole 40mg IV every 24 hours.
3. Blood glucose levels were managed using insulin injections as per the scale.

To support healing and urinary infection patient was also advised to take Tab Chandraprabha vati once daily after meals. After two days the patient was instructed to rely on medications as prescribed. The specific instructions are as follows;:

Tab Cefibact 625 mg 1 BD af	5 days
Tab. Pan 40mg 1 OD bf	
Tab. Chandraprabha Vati 2 BD af	15 days
Tab. Becosules 1 BD af	15 days
Tab. Limcee 500mg 1 OD af	15 days
Tab. Triafla Guggul 2 BD af	10 days
Panchvalkala ointment dressing	15 days
Murivenna tail gudapurana 10 ml BD	15 days
Dhamasa Suppository – BD	5 days then SOS



1. Post-operative active bleeding during dressing management done by pressure bandaging. Other pictures on post-operative 3 and 6.
2. Opening found at scrotal region, probing and wound opened, tract currated and sutured
3. Follow up pictures of post-operative 10, 14 (shows healing and healthy granulation tissue at operative wound) and 40 shows healing of the wound completely.

**Fig 3: Post operative Pictures of operative site:**

On the fifth day after surgery, an opening was discovered in the scrotal region which was treated as a post op complication. The wound tract was probed by the use of fistula probe the tract then dissected lay open method, thoroughly cleaned, curetted, and then sutured by ethilon 3-0 in simple interrupted suture manner.



Fig 4: Various methods used for wound healing and pain management

#### ON DISCHARGE MEDICATION

S.No	Name	Dose	Frequency	Time	Anupan	Route of administration
1.	Tab <i>Trifala Guggul</i>	2 Tab	BD	af	water	Oral
2.	Tab. <i>Chandaraprabha Vati</i>	2 Tab	BD	af	water	Oral
3.	<i>Panchvalkala ointment</i>	Dressing	BD	-	-	Local
4.	<i>Murivenna tail</i>	10 ml	BD	af	-	Gudapurana
5	Tab. Becosules	1tab	BD	af	water	Oral
6	Tab. Limcee	500 mg 1tab	OD	af	water	Oral

#### DISCUSSION

The fistula was treating using a combination of modern surgical techniques and Ayurveda treatments. What made this case unique was that it initially started as an abscess but developed into a scrotal fistula even though the patient had undergone surgery for it just four months prior. The complexity increased due, to the patient's diabetes and the accompanying pain, which posed challenges during treatment. The situation became more

complicated when the scrotal abscess recurred and transformed into a fistula further hindered by the patient's diabetes, known to affect wound healing. Therefore, the primary focus was on managing the patient's pain and preventing any inflammation considering the discomfort and the complex nature of the condition.

To address these concerns in the treatment plan Tab *Chandraprabha Vati* and Tab *Trifala Guggul* was prescribed. These medications played a role in addressing the patient's condition and enhancing their wellbeing. Additionally, *Panchvalkala* Ointment dressing results for its healing property to aid in their recovery process was employed. *Murivenna Tail Gudapurana* exhibited promising outcomes in managing pain and reducing inflammation.

*Dhamasa* Suppository was introduced to uphold the principles of Ayurveda and provide an alternative to Diclofenac Suppository. It is a solution, for pain management.

- 1. *Murivenna Tail Gudapurana*:** *Murivenna Tail* is composed of ingredients that possess inflammatory and analgesic properties. It can be utilized for managing operative pain in anorectal surgeries. The components of *Murivenna Tail* have actions that aid, in wound healing and pain management. These actions are as follows;

	<b>Drugs in <i>Murivenna Tail</i></b>	<b>Pharmacological action</b>
1	<i>Pongamia pinnata (Karanja)</i> <sup>28</sup>	Anti-inflammatory
2	<i>Piper betle (Nagavalli)</i> <sup>29</sup>	Anti-inflammatory Analgesics Anti-microbial Anti-bacterial
3	<i>Asparagus racemosus (Shatavari)</i> <sup>30</sup>	Anti-inflammatory
4	<i>Allium cepa (Palandu)</i> <sup>31</sup>	Anti-inflammatory wound healing
5	<i>Aloe vera (Kumari)</i> <sup>32</sup>	Anti-inflammatory Analgesics
6	<i>Spermacoca hispida (Buka)</i> <sup>33</sup>	Anti-inflammatory Analgesics
7	<i>Erythrina indica (Paribhadra)</i> <sup>34</sup>	Anti-inflammatory Analgesics Anti-bacterial
8	<i>Moringa oleifera (Sigru)</i> <sup>35</sup>	Anti-inflammatory Anti-bacterial
9	<i>Coconut oil (Cocos nucifera)</i> <sup>36,37</sup>	Anti-inflammatory Analgesic

- 2. *Panchavalkal Ointment*:** The pharmacological effects of *Panchavalkala* indicate that all five of its component drugs have properties that can reduce inflammation relieve pain, fight against microbes and promote wound healing.<sup>(38-43)</sup>

	<b>Chemical constituents</b>	<b>Ingridients</b>	<b>Mode of Actions</b>
1	Tannins	<i>Vata</i> <i>Udumbara</i> <i>Ashwatta</i>	Anti-inflammatory Anti-microbial Ability to increase collage contents



		<i>Pareesha Plaksha</i>	
2	Phytosterols B-sitosteryl D-glucoside	<i>Vata Ashwatta</i>	Analgesics
3	Flavonoids	<i>Ashwatta Plaksha</i>	Anti-inflammatory
4	Glycosides Phytosterols	<i>Vata Udumbara</i>	Promote healing
5	Vitamin A, K	<i>Vata</i>	Epithelialization

3. **Dhamasa suppository:** *Dhamasa (Fagonia indica)* is well known for its range of properties. It has been found to possess anti-inflammatory antimicrobial astringent febrifuge properties. These beneficial effects can be attributed to the presence of compounds like triterpenoidal saponins, flavonol glycosides and ursolic and oleanolic acids in their pure forms or, as derivatives.<sup>44</sup>
4. **Triphala Guggulu:** The ingredients of *Triphala Guggulu* consist of *Haritaki (Terminalia chebula)*, *Vibhitaki (Terminalia bellirica)*, *Aamalki (Emblica officinalis)*, *Pippali (Piper longum)* and *Guggulu (Commiphora mukul)*. Here are the observed pharmacological effects of these components when used experimentally.<sup>45</sup>:

	Drug	Experimental Pharmacological Action <sup>45</sup>
1	<i>Haritaki</i>	Anti-microbial activity, anti-inflammatory, Anti-oxidant, Anti-bacterial activity against <i>Salmonella typhi</i> ,
2	<i>Vibhitaki</i>	Anti-oxidant, Anti-spasmodic, anti-microbial, Anti-bacterial activity Anti-fungal, anti-viral, anti-malarial Immunomodulator, anti-inflammatory
3	<i>Aamalki</i>	Anti-oxidant Anti-ulcerogenic, analgesic, anti-viral, anti-inflammatory activity Immunomodulatory, anti-microbial activity
4	<i>Pippali</i>	Bioavailability enhancer, Analgesic activity Immunomodulatory, Anti-bacterial Anti-inflammatory activity
5	<i>Guggulu</i>	Anti-Inflammatory Anti-microbial Skin diseases, Anti-oxidant activity

## CONCLUSION

The remarkable outcome of this case truly demonstrates the results achieved by combining modern surgical techniques with *Ayurveda* treatments. It wasn't, about resolving the surgical issue; it also had a positive impact, on the overall wellbeing of the patient. This exemplifies how practicing *Ayurveda* entails adopting an integrated approach to successfully treat and care for patients.

**Author's contribution statement-** Dr. Yogesh Yadav came up with the study idea carried out the investigations and made contributions, to the draft. Dr. Sheetal Asutkar brought in their expertise, oversaw the case. Dr. Amar Kadav designed a treatment plan based on principles and performed pharmacological analyses. Dr. Meenakshi Dagar played a role by reviewing and editing the manuscript. All authors gave their approval, for the published version.

## REFERENCES

1. SRB's Manual of Surgery by Shri Ram Bhat M 4<sup>TH</sup> Edition Jaypee publication Ch.1 pg.no.30
2. Ramanujam PS, Prasad ML, Abcarian H, Tan AB. Perianal abscesses and fistulas. A study of 1023 patients. *Dis Colon Rectum*. 1984;27:5937.
3. Vasilevsky CA, Gordon PH. The incidence of recurrent abscesses or fistulainano following anorectal suppuration. *Dis Colon Rectum*. 1984;27:126-30
4. Sainio P. Fistulainano in a defined population. Incidence and epidemiological aspects. *Ann Chir Gynaecol*. 1984;73:219-24.
5. Abcarian H. Anorectal infection: abscess fistula. *Clin Colon Rectal Surg*. 2011;24:1421.
6. Parks AG. Pathogenesis and treatment of fistula in ano. *Br Med J*. 1961;1:463-9.
7. Eisenhammer S. The internal anal sphincter and the anorectal abscess. *Surg Gynecol Obstet*. 1956;103:501-6.
8. Kumar TS, Naresh G, Akther MJ. Lift procedure for long complex ano-scrotal fistula and review of literature. *International Surgery Journal*. 2017;4(1):423-6
9. Parks AG, Stitz RW. The treatment of high fistula in ano. *Dis Colon Rectum*. 1976;19:487-99.
10. Mizrahi N, Wexner SD, Zmora O. Endorectal advancement flap: are there predictors of failure? *Dis Colon Rectum*. 2002;45:1616-21
11. Shastri Kaviraj Ambikadatta, Sushruta Samhita, Ayurveda TatvaSandeepika, Hindi commentary, 1997th edition, Reedition 2016, Varanasi, Chaukhamba Sanskrit Samsthana, Sutrasthana,30/4-5, page no,165
12. Shastri Kaviraj Ambikadatta, Sushruta Samhita, Ayurveda Tatva Sandeepika, 2016 edition, Varanasi, Chaukhambha Sanskrit Samsthana, Nidana Sthana, 4/4, page no,317
13. Hughes E, Cuthberston AM, Killinback MK. Anorectal suppuration II, anal fistula. *Colorectal Surgery*, 1st ed. Medical Division of Longman Group Limited, Robert Stevenson House, 1 – 3 Baxter's place, Leith Walk, Edinburgh EH1 3AF: Publisher Churchill Livingstone; 1983. p. 142-62.
14. Öztürk E, Gülcü B. Laser ablation of fistula tract: a sphincter-preserving method for treating fistula-in-ano. *Diseases of the colon & rectum*. 2014 Mar 1;57(3):360-4.
15. Smith GL, Bunker CB, Dinneen MD. Fournier's gangrene. *Br JUrol* 1998;81:347-55.
16. Laucks SS 2nd. Fournier's gangrene. *Surg Clin North Am*1994;74:1339-52.
17. SRB's Manual of Surgery by Shri Ram Bhat M 4<sup>TH</sup> Edition jaypee publication Ch.25 pg.no.1055.
18. Han JG, Wang ZJ, Zheng Y et al (2016) Ligation of Intersphincteric Fistula Tract vs Ligation of the Intersphincteric Fistula Tract plus a bioprosthentic anal fistula plug procedure in patients with transsphincteric anal fistula: early results of a multicenter prospective randomized trial. *Ann Surg* 264:917–922 (PMID: 26606429)
19. Köckerling F, Alam NN, Narang SK, Daniels IR, Smart NJ (2015) Treatment of fistula-in-ano with fistula plug—a review under special consideration of the technique. *Front Surg* 16:55
20. Meinerio P, Mori L (2011) Video-assisted anal fistula treatment (VAAFT): a novel sphincter-saving procedure for treating complex anal fistulas. *Tech Coloproctol* 15:417–422
21. Giamundo P, Geraci M, Tibaldi L, Valente M (2013) Closure of fistula-in-ano with laser—FiLaC™: an effective novel sphincter-saving procedure for complex disease. *Colorectal Dis* 16:110–115
22. Wilhelm A (2011) A new technique for sphincter-preserving anal fistula repair using a novel radial emitting laser probe. *Tech Coloproctol* 15:445–449
23. Litza EM, van Wijk JJ, Gosselink MP, Doornebosch P, Zimmerman DDE, Schouten WR (2010) Seton drainage prior to transanal advancement flap repair: useful or not? *Int J Colorectal Dis* 25:1499–1502

24. Tasci I (2003) The fistulectome: a new device for treatment of complex anal fistulas by “Core-Out” fistulectomy. *Dis Colon Rectum* 46:1566–1571
25. Zirak-Schmidt S, Perdawood SK (2014) Management of anal fistula by ligation of the intersphincteric fistula tract—a systematic review. *Dan Med J* 61:A4977
26. Iukhvidova ZhM, Makeeva NS, Zinov’eva OI, Sidorova TA (1978) Use of lasers in the treatment of diseases of the anorectal region. *Sov Med* 2:86–90
27. Slutzki S, Abramsohn R, Bogokowsky H (1981) Carbon dioxide laser in the treatment of high anal fistula. *Am J Surg* 141:395–39
28. Chopade VV, Tankar AN, Pande VV, Tekade AR, Gowekar NM, Bhandari SR, Khandake SN. *Pongamia pinnata*: Phytochemical constituents, traditional uses and pharmacological properties: A review. *International Journal of Green Pharmacy (IJGP)*. 2008;2(2).
29. Depi S. Review of traditional use, phytochemical and pharmacological activity of Piper betle L. *Galore International Journal of Health Sciences and Research*. 2020;5(3):59-66.
30. Plangsombat N, Rungsardthong K, Kongkaneramt L, Waranuch N, Sarisuta N. Anti-inflammatory activity of liposomes of *Asparagus racemosus* root extracts prepared by various methods. *Exp Ther Med*. 2016 Oct;12(4):2790-2796. doi: 10.3892/etm.2016.3661. Epub 2016 Sep 5. PMID: 27698785; PMCID: PMC5038339.
31. Chakraborty AJ, Uddin TM, Zidan BR, Mitra S, Das R, Nainu F, Dhama K, Roy A, Hossain MJ, Khusro A, Emran TB. *Allium cepa*: A treasure of bioactive phytochemicals with prospective health benefits. *Evidence-Based Complementary and Alternative Medicine: eCAM*. 2022;2022.
32. Joseph B, Raj SJ. Pharmacognostic and phytochemical properties of *Aloe vera* linn an overview. *Int J Pharm Sci Rev Res*. 2010 Jan 1;4(2):106-10.
33. Sundaram RL, Vasanthi HR. *Spermacoce hispida* Linn: a critical review on pharmacognosy, phytochemistry, and pharmacology based on traditional claims. *Phytomedicine Plus*. 2022 Feb 1;2(1):100143.
34. Kaushal A, Sharma M, Navneet MS, Sharma M. Ethnomedicinal, phytochemical, therapeutic and pharmacological review of the genus *Erythrina*. *International Journal of Botany Studies*. 2020;5(6):642-8.
35. Adusei S, Azupio S, Emmanuel TM, MacCarthy C, Akomeng N. Phytochemistry, nutritional composition and pharmacological potential of *Moringa oleifera*: A comprehensive review. *International journal of plant based pharmaceuticals*. 2022 Jun 25;2(2):228-38.
36. Intahphuak S, Khonsung P, Panthong A. Anti-inflammatory, analgesic, and antipyretic activities of virgin coconut oil. *Pharm Biol*. 2010 Feb;48(2):151-7. doi: 10.3109/13880200903062614. PMID: 20645831.
37. Erawati T, Hariyadi DM, Rosita N, Purwanti T. The Anti-inflammatory Activity of p-methoxycinnamic acid (PMCA) in the Nanostructured lipid carrier (NLC) system using combinations of solid lipid, beeswax-oleum cacao and liquid lipid, Virgin Coconut oil (VCO). *Research Journal of Pharmacy and Technology*. 2019;12(8):1-7.
38. Villegas LF, Fernandez ID, Maldonado H, Torres R, Zavaleta A, Vaisberg AJ, Hammond GB. Evaluation of the wound-healing activity of selected traditional medicinal plants from Peru. *J Ethnopharmacol*. 1997;55:193–200. [PubMed] [Google Scholar]
39. Sukhlal MD. *In vitro* antioxidant and free radical scavenging activity of some *Ficus* species. *Pharmacogn Mag*. 2008;4:124–8. [Google Scholar]

40. Patil VV, Pimpikar VR. Pharmacognostical studies and evaluation of anti inflammatory activity of *Ficus bengalensis* linn. *J Young Pharm.* 2009;1:110–1. [Google Scholar]
41. Preeti R, Devanathan VV, Loganathan M. Antimicrobial and antioxidant efficacy of some medicinal plants against food born pathogens. *Adv Biol Res.* 2010;4:122–5. [Google Scholar]
42. Mousa O, Vuorela P, Kiviranta J, Wahab SA, Hiltunen R, Vuorela H. Bioactivity of certain Egyptian *Ficus* species. *J Ethnopharmacol.* 1994;41:71–6. [PubMed] [Google Scholar]
43. Thakare NV, Suralkar AA. Antinociceptive and anti-inflammatory effects of *Thespesia populnea* bark extract. *Indian J Exp Biol.* 2010;48:39–45. [PubMed] [Google Scholar]
44. Anil, Pareek & Nikhil, Batra & Goyal, Dr. Manoj & Nagori, Badri. (2012). Phytochemicals and biological activities of *Fagonia indica*. *Int Res J Pharm.* 3. 56-59.
45. Rawat, Neelam & Mitra, Shuchi & Sharma, Usha & Sharma, Khem Chand. (2023). An Overview of *Triphala Guggulu* and its Ingredients. *AYUSHDHARA.* 47-59. 10.47070/ayushdhara.v10iSuppl1.1134.