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LASER APPLICATIONS IN ANORECTAL PATHOLOGIES: PRINCIPLES, TECHNIQUES, AND CLINICAL OUTCOMES

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ABSTRACT

Background: Anorectal disorders such as hemorrhoids, fistula-in-ano, fissure-in-ano, pilonidal sinus, and anal condyloma are common conditions that significantly affect quality of life. Conventional surgical procedures, though effective, are often associated with postoperative pain, bleeding, prolonged wound healing, and hospital stay. Over the last two decades, laser technology has emerged as a minimally invasive alternative in proctology, offering precise tissue handling with reduced collateral damage. **Aim:** To evaluate the principles, techniques, and clinical outcomes of laser applications in the management of anorectal pathologies. **Objectives:** To understand the basic principles of laser use in anorectal surgery To review commonly employed laser techniques for various anorectal disorders. To assess clinical outcomes, safety, and advantages of laser-based procedures. **Materials and Methods:** A narrative review of available literature was conducted using classical surgical texts, contemporary proctology references, and peer-reviewed articles indexed in PubMed, Google Scholar, and Scopus. Studies focusing on laser hemorrhoidoplasty, laser fistula closure, laser fissure procedures, and laser treatment of pilonidal sinus were analyzed with emphasis on technique, indications, advantages, limitations, and outcomes. **Results:** Laser procedures demonstrated favorable clinical outcomes across various anorectal conditions. Most studies reported reduced intraoperative blood loss, minimal postoperative pain, early ambulation, shorter hospital stay, and faster return to routine activities compared to conventional surgeries. Recurrence rates were comparable or lower in

selected indications when proper case selection and technique were followed. Complication rates such as infection, incontinence, and delayed wound healing were generally low. **Discussion:** The effectiveness of laser therapy is primarily attributed to its precise photothermal action, which allows controlled tissue ablation, coagulation, and fibrosis with minimal damage to surrounding structures. However, outcomes are influenced by surgeon expertise, type of laser used, disease stage, and patient factors. High equipment cost and limited long-term data remain important concerns. **Conclusion:** Laser applications represent a safe and effective minimally invasive option in the management of selected anorectal pathologies. When used judiciously, laser techniques can improve patient comfort and postoperative recovery. Further large-scale randomized controlled trials with long-term follow-up are required to establish standardized protocols and definitive clinical guidelines.

Keywords: Laser proctology, anorectal disorders, laser hemorrhoidoplasty, laser fistula treatment, minimally invasive surgery, clinical outcomes

INTRODUCTION

Anorectal disorders are among the most common conditions encountered in surgical and proctology practice. Diseases such as hemorrhoids, fistula-in-ano, fissure-in-ano, pilonidal sinus, and anal warts cause significant discomfort, pain, bleeding, discharge, and impairment of daily activities. Despite being non-life-threatening in most cases, these conditions adversely affect quality of life and often compel patients to seek repeated medical or surgical interventions.[1]

Conventional surgical procedures have long been the mainstay of treatment for anorectal pathologies. Although effective, these techniques are frequently associated with postoperative pain, bleeding, wound complications, longer hospital stay, and delayed return to normal activities. Fear of surgery and postoperative morbidity often leads patients to delay treatment, resulting in disease progression and complications.[2]

With advances in surgical technology, minimally invasive procedures have gained prominence in anorectal practice. Laser therapy has emerged as a modern modality that allows precise tissue interaction with minimal collateral damage. The unique properties of laser energy enable controlled cutting, coagulation, and vaporization of tissues, thereby reducing operative trauma and postoperative morbidity.[3]

In recent years, various laser-based techniques such as laser hemorrhoidoplasty, laser fistula closure, laser fissure management, and laser treatment of pilonidal sinus have been

increasingly adopted. These procedures aim to preserve normal anatomy, minimize sphincter injury, and promote faster healing. Clinical studies have reported encouraging outcomes in terms of reduced pain, minimal blood loss, early ambulation, and high patient satisfaction.[4]

However, the success of laser applications depends on appropriate patient selection, understanding of laser principles, choice of technique, and surgeon expertise. While short-term results appear promising, the availability of long-term data and standardized treatment protocols remains limited. Therefore, a comprehensive understanding of laser principles, techniques, and clinical outcomes is essential to define its role in the management of anorectal pathologies.[5]

AIM AND OBJECTIVES

Aim:

To evaluate the principles, techniques, and clinical outcomes of laser applications in the management of anorectal pathologies.

Objectives:

1. To understand the basic principles of laser use in anorectal surgery.
2. To review commonly employed laser techniques for various anorectal disorders.
3. To assess clinical outcomes, safety, and advantages of laser-based procedures.

CONCEPTUAL STUDY

ANORECTAL PATHOLOGIES (AYURVEDIC PERSPECTIVE)

In *Ayurveda*, anorectal disorders are mainly described under *Guda Roga*. *Guda* is considered a *Pradhana Marma* and an important *Bahirmukha Srotas* involved in the expulsion of *Purisha*. Any disturbance in *Agni*, *Dosha*, *Dhatu*, *Mala* balance, or improper *Ahar* and *Vihar* directly affects *Guda Pradesh*, leading to various pathological conditions.[6]

Anatomical and Functional Concept of *Guda*

According to classical texts, *Guda* is the terminal part of the *Annavaha Srotas* and *Purishavaha Srotas*. It is closely related to *Apana Vayu*, which governs defecation, flatus, micturition, and reproductive functions. The normal function of *Guda* depends on the proper movement of *Apana Vayu*, balanced *Agni*, and well-formed *Purisha*. Disturbance in these leads to *Guda Roga*.[7]

Etiopathogenesis (*Nidana* and *Samprapti*)

The common *Nidana* for anorectal pathologies include:

- Improper dietary habits such as *Ati Ruksha*, *Ati Guru*, *Ati Tikshna*, *Ati Ushna* Ahar
- Excessive intake of dry, spicy, junk, fermented food
- Irregular bowel habits, suppression of natural urges (*Vega Dharana*)
- Sedentary lifestyle, prolonged sitting, lack of physical activity
- Psychological factors like stress and anxiety affecting *Vata*

These factors vitiate mainly *Vata Dosha*, followed by *Pitta* and *Kapha*. *Vata Prakopa* causes dryness, fissuring, pain, and constipation. *Pitta Dushti* leads to inflammation, burning sensation, bleeding, and suppuration. *Kapha Dushti* results in swelling, heaviness, discharge, and chronicity.[10]

The *Samprapti* involves:

- *Agni Mandya* → improper digestion
- Formation of hard or abnormal *Purisha*
- Obstruction or abnormal movement of *Apana Vayu*
- Localized *Dosha Dushti* in *Guda Pradesh*
- Manifestation of specific *Guda Roga*

Description of Major Anorectal Disorders in *Ayurveda*

a. *Arsha* (Hemorrhoids)

Arsha is described as a disease arising due to derangement of *Mamsa* and *Meda* at the anal region. It is considered one of the *Ashta Mahagada* due to its chronicity and complications. Depending on *Dosha* predominance, *Arsha* is classified into *Vataja*, *Pittaja*, *Kaphaja*, *Raktaja*, *Sannipataja*, and *Sahaja*. Symptoms include pain, bleeding, prolapse, discharge, and constipation.[11]

b. *Parikartika* (Fissure-in-ano)

Parikartika is characterized by cutting and tearing pain in the anal region, especially during and after defecation. It is mainly caused by *Vata-Pitta Dushti*. Hard stools injure the anal mucosa, leading to ulceration, spasm, severe pain, burning sensation, and fear of defecation.[12]

c. *Bhagandara* (Fistula-in-ano)

Bhagandara is a chronic suppurative condition involving abnormal tract formation around *Guda*. It originates from an infected *Pidika* near the anal region. Different types such as *Shataponaka*, *Ushtragreeva*, *Parisravi*, *Shambukavarta*, and *Unmargi* are described based on *Dosha* involvement and tract direction. It is considered *Krichchrasadhya* due to high recurrence.[13]

d. *Gudavidradhi* (Perianal Abscess)

This is an acute inflammatory condition characterized by pain, swelling, redness, fever, and pus formation. It results from severe *Pitta* and *Rakta Dushti* with involvement of *Mamsa Dhatu*. If untreated, it may lead to *Bhagandara*.[14]

e. *Gudabhramsha* (Rectal Prolapse)

It occurs due to chronic constipation, weakness of *Guda*, and excessive strain. *Vata Prakopa* and *Dhatu Kshaya* play a major role. It is commonly seen in children, elderly, and debilitated individuals.[15]

Ayurvedic Principles of Management

Management focuses on:

- Correction of *Agni* and bowel habits
- *Vata Anulomana*
- Local therapies like *Abhyanga*, *Swedana*, *Avagaha Sweda*
- *Kshara Karma*, *Agnikarma*, and *Ksharasutra* in selected cases
- Use of *Shamana* and *Shodhana* therapies
- Lifestyle and dietary regulation

Minimally invasive parasurgical procedures are emphasized to preserve *Guda* function and prevent recurrence.

MODERN PERSPECTIVE

Anorectal pathologies in modern medicine encompass disorders of the anal canal, perianal region, and distal rectum. These conditions are highly prevalent and are influenced by lifestyle, diet, bowel habits, and anatomical factors.[16]

Anatomy and Physiology

The anal canal is approximately 3–4 cm long and consists of internal and external sphincters, anoderm, and anal glands. The internal sphincter maintains continence at rest, while the external sphincter provides voluntary control. Any pathology affecting these structures leads to pain, bleeding, discharge, or incontinence.

Common Anorectal Disorders

a. Hemorrhoids

Hemorrhoids are dilated vascular cushions of the anal canal. They are classified as internal or external and graded from I to IV based on prolapse. Etiological factors include chronic constipation, straining, pregnancy, obesity, and prolonged sitting. Symptoms include painless bleeding, prolapse, pain, thrombosis, and pruritus.[17]

b. Anal Fissure

An anal fissure is a longitudinal tear in the anoderm, usually located posteriorly. It is associated with hypertonia of the internal sphincter, leading to ischemia and delayed healing. Patients present with severe pain during defecation, bleeding, and sphincter spasm.[18]

c. Fistula-in-ano

This condition involves an abnormal communication between the anal canal and perianal skin, commonly resulting from cryptoglandular infection. It is classified based on its relationship with sphincter muscles into intersphincteric, transsphincteric, suprasphincteric, and extrasphincteric fistulas. Recurrence and incontinence are major concerns.[19]

d. Perianal Abscess

An acute infection of anal glands leading to pus collection. It presents with severe pain, swelling, fever, and redness. Prompt drainage is required to prevent fistula formation.[20]

e. Rectal Prolapse

Rectal prolapse involves protrusion of rectal wall through the anal opening. It is associated with chronic constipation, pelvic floor weakness, neurological disorders, and aging. It may be partial or complete.

Modern Management Approaches

Management includes:

- Conservative measures such as dietary fiber, stool softeners, and lifestyle modification
- Pharmacological therapy for pain, inflammation, and infection
- Office procedures like rubber band ligation, sclerotherapy, and infrared coagulation
- Surgical procedures including hemorrhoidectomy, sphincterotomy, fistulotomy, and advancement flaps

In recent years, laser-based procedures have gained attention due to minimal tissue trauma, reduced postoperative pain, faster healing, and early return to daily activities.

Rationale for Minimally Invasive Techniques

Modern proctology aims to reduce postoperative morbidity while preserving continence and anatomy. Laser technology provides precision, hemostasis, and controlled tissue destruction, making it suitable for selected anorectal conditions when applied with proper case selection and expertise.[21]

LASER APPLICATIONS IN ANORECTAL PATHOLOGIES

Principles

Laser technology is based on the principle of *Light Amplification by Stimulated Emission of Radiation*. In anorectal surgery, laser energy primarily works through a photothermal mechanism, where controlled heat is generated at the tissue level. This heat causes coagulation, vaporization, or shrinkage of pathological tissue depending on wavelength, power, and exposure time. The precision of laser energy allows selective targeting of diseased tissue while preserving surrounding healthy structures, which is especially important in the anal region where sphincter integrity is crucial for continence.[22]

The laser produces immediate sealing of small blood vessels and lymphatics, resulting in excellent hemostasis and a relatively bloodless field. This reduces tissue edema and postoperative inflammation. Additionally, the thermal effect creates a localized sterilization zone, lowering bacterial load and minimizing postoperative infection. The depth of penetration can be accurately controlled, ensuring uniform tissue effect without excessive collateral damage.[23]

From an *Ayurvedic* perspective, the principle of laser closely resembles *Agnikarma*, where controlled thermal energy is applied to eradicate diseased tissue, pacify aggravated *Vata* and

Kapha, improve local circulation, and reduce recurrence. The targeted action and minimal tissue trauma align with the classical concept of localized parasurgical intervention.[24]

Types of Lasers Used in Anorectal Practice

Different laser systems are employed in proctology based on tissue interaction characteristics. Diode lasers are most commonly used due to their compact size, effective coagulation properties, and ease of handling. They offer precise cutting with minimal lateral thermal spread. CO_2 lasers provide superficial vaporization with high precision and are useful for surface lesions and anal warts. Nd:YAG lasers have deeper penetration and strong coagulative effects, making them suitable for selected internal procedures. The choice of laser depends on the nature of pathology, depth of lesion, need for coagulation, and surgeon expertise. Proper selection ensures optimal outcomes with minimal complications.[25]

Laser Techniques in Hemorrhoidal Disease

Laser hemorrhoidoplasty involves submucosal delivery of laser energy into the hemorrhoidal cushion using a radial fiber. The emitted energy causes coagulation of venous plexuses, shrinkage of hemorrhoidal tissue, and subsequent fibrosis. This results in fixation of the hemorrhoidal mass to the underlying tissue without excision. The anoderm and mucosa are preserved, which significantly reduces postoperative pain. Since there is no open wound, the risk of infection and delayed healing is minimal. This technique is particularly effective in grade II and selected grade III hemorrhoids. In *Ayurveda*, this tissue-shrinking and fibrosis effect parallels the concept of *Shoshana* and *Lekhana* of pathological *Mamsa* and *Meda* in *Arsha*.[26]

Laser Techniques in Fistula-in-Ano

Laser treatment of fistula-in-ano, commonly known as FiLaC, involves introducing a laser fiber through the external opening of the fistulous tract. Laser energy is delivered circumferentially while the fiber is gradually withdrawn. This leads to destruction of the epithelial lining of the tract and induces controlled fibrosis, resulting in tract closure. The most significant advantage of this technique is preservation of sphincter muscles, thereby minimizing the risk of postoperative incontinence. Healing occurs from within without large wounds. From an *Ayurvedic* viewpoint, this sphincter-preserving, tract-targeted approach is conceptually similar to minimally invasive *Ksharasutra* therapy, where pathological tissue is destroyed while maintaining normal anatomy.[27]

Laser Application in Anal Fissure

In chronic fissure-in-ano, laser is used either for fissure ablation or controlled internal sphincterotomy. The laser reduces hypertonicity of the internal sphincter, improves local blood flow, and promotes rapid healing of the fissure. The precise energy delivery minimizes tissue trauma and postoperative spasm. Patients experience early relief from pain and burning sensation, with faster epithelialization of the fissure. The reduced fear of defecation further helps restore normal bowel habits. This action corresponds with pacification of aggravated *Vata* and *Pitta* in *Parikartika*.[28]

Laser Management of Pilonidal Sinus

Laser treatment of pilonidal sinus involves cleaning and curettage of the sinus tract followed by insertion of a laser fiber. Laser energy ablates the sinus epithelium from within, leading to collapse and fibrosis of the tract. Unlike conventional wide excision, this technique avoids large wounds and secondary healing. Patients benefit from minimal postoperative pain, negligible scarring, and early return to daily activities. Recurrence rates are low when the tract is adequately ablated. The minimally invasive nature aligns with *Ayurvedic* principles of localized disease eradication without excessive tissue loss.[29]

Laser Use in Anal Warts and Benign Lesions

Laser vaporization is used for precise removal of anal warts and small benign lesions. The focused beam allows complete removal with minimal damage to adjacent tissue. Bleeding is minimal due to simultaneous coagulation, and healing is rapid with good cosmetic results.

Clinical Outcomes of Laser Applications

Clinical outcomes of laser procedures in anorectal disorders are generally favorable. Postoperative pain is significantly reduced compared to conventional surgeries, mainly due to absence of large incisions and minimal tissue handling. Intraoperative blood loss is negligible, and postoperative bleeding is rare. Hospital stay is markedly shortened, with most procedures performed on a day-care basis. Early ambulation and rapid return to normal activities improve patient satisfaction and compliance. Preservation of sphincter function is a major advantage, particularly in fistula management.[30]

Complications and Recurrence

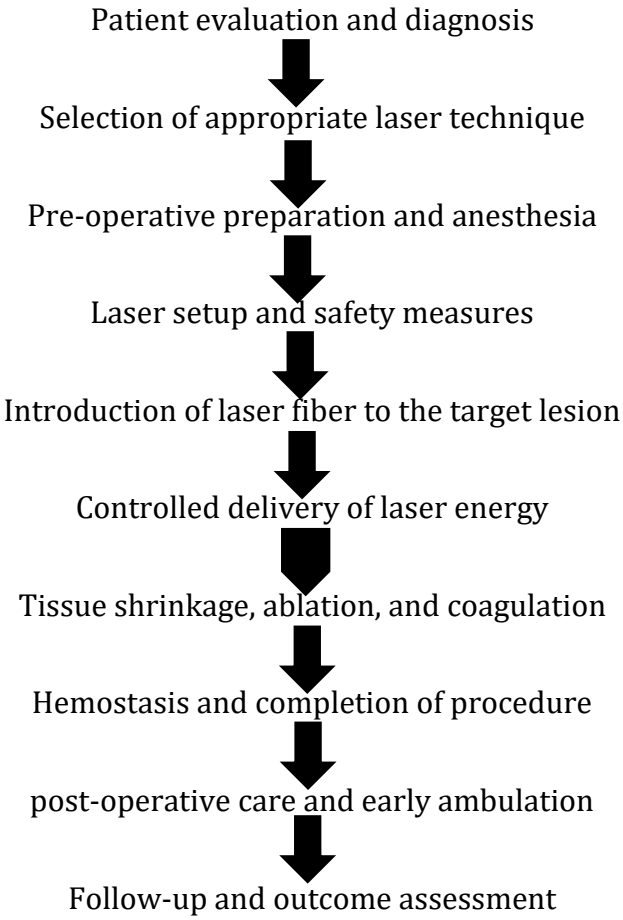
Complications such as infection, anal stenosis, delayed healing, and incontinence are uncommon when laser procedures are performed with proper technique and patient

selection. Recurrence rates are comparable or lower than conventional methods in selected cases, although long-term data are still evolving.[31]

Limitations and Future Scope

Despite its advantages, laser therapy has limitations including high equipment cost, requirement of technical expertise, and limited availability in resource-constrained settings. Long-term randomized controlled studies are needed to establish standardized protocols and definitive guidelines.

Procedure of Laser Application in Anorectal Pathologies



Results and Findings

- Laser procedures resulted in significant reduction in intraoperative bleeding due to effective coagulative action of laser energy.
- Postoperative pain was markedly less compared to conventional surgical methods, leading to improved patient comfort.

- Most laser procedures were performed as day-care surgeries, allowing early ambulation and shorter hospital stay.
- Healing time was faster as there were minimal or no open wounds, resulting in early return to routine activities.
- Preservation of anal sphincter integrity was observed, especially in fistula-in-ano cases, with no or minimal postoperative incontinence.
- Postoperative complications such as infection, edema, and wound discharge were minimal.
- Recurrence rates were low in appropriately selected cases when proper laser technique was applied.
- Patient satisfaction was high due to reduced pain, minimal scarring, and rapid recovery.
- Laser techniques demonstrated safety and efficacy across multiple anorectal pathologies when used with correct indications.
- Overall outcomes supported laser application as an effective minimally invasive modality in anorectal disorder management.

DISCUSSION

Laser application in anorectal pathologies has emerged as an effective minimally invasive modality, addressing many limitations of conventional surgical procedures. The present findings highlight that precise photothermal action of laser energy allows targeted destruction of pathological tissue with minimal damage to surrounding structures. This precision is particularly valuable in the anorectal region, where preservation of sphincter function and normal anatomy is essential for maintaining continence and quality of life.[32]

One of the most consistent observations across laser-based procedures is the significant reduction in postoperative pain and bleeding. The excellent hemostatic property of laser energy results in a relatively bloodless operative field, reduced tissue edema, and minimal postoperative inflammation. These factors contribute to faster wound healing, early ambulation, and shorter hospital stay. Patients undergoing laser procedures were able to resume daily activities earlier, which improves overall treatment acceptance and compliance.[33]

Preservation of sphincter integrity is a major advantage, especially in the management of fistula-in-ano. Laser techniques such as tract ablation and controlled fibrosis allow closure of fistulous tracts without cutting sphincter muscles, thereby minimizing the risk of postoperative incontinence. This outcome reflects the importance of tissue-sparing approaches in modern proctology and parallels the *Ayurvedic* concept of targeted parasurgical interventions like *Agnikarma*, where diseased tissue is eliminated without extensive damage to healthy structures.[34]

Despite these favorable outcomes, certain limitations must be acknowledged. The success of laser procedures depends on appropriate patient selection, disease stage, and surgeon expertise. High equipment cost and limited availability restrict widespread use, and long-term comparative data are still evolving. Therefore, while laser applications offer promising results and improved patient comfort, further large-scale studies with extended follow-up are necessary to establish standardized protocols and define their definitive role in anorectal pathology management.[35]

CONCLUSION

Laser applications in anorectal pathologies provide a safe, effective, and minimally invasive treatment option with clear advantages over conventional surgical methods. The precise photothermal action of laser energy ensures minimal tissue trauma, excellent hemostasis, reduced postoperative pain, faster healing, and early return to daily activities while preserving anal sphincter function. When applied with proper patient selection and technical expertise, laser techniques yield favorable clinical outcomes and high patient satisfaction. However, the need for standardized protocols and long-term outcome data remains, and further well-designed studies are essential to establish laser therapy as a definitive modality in the comprehensive management of anorectal disorders.

CONFLICT OF INTEREST -NIL

SOURCE OF SUPPORT -NONE

REFERENCES

1. Lohsiriwat V. Hemorrhoids: from basic pathophysiology to clinical management. World J Gastroenterol. 2012;18(17):2009–2017.
2. Loder PB, Kamm MA, Nicholls RJ, Phillips RK. Haemorrhoids: pathology, pathophysiology and aetiology. Br J Surg. 1994;81(7):946–954.

3. Khan S, Pawlak SE, Eggenberger JC, Lee CS. Modern management of hemorrhoidal disease. Dis Colon Rectum. 2004;47(3):333–341.
4. Brusciano L, Gambardella C, Terracciano G, et al. Laser hemorrhoidoplasty: a new procedure for hemorrhoidal disease. Tech Coloproctol. 2013;17(3):325–330.
5. Milito G, Cadeddu F, Muzi MG, Nigro C. Laser therapy in proctology: indications and outcomes. Updates Surg. 2018;70(3):349–354.
6. *Charaka Samhita*, Sutra Sthana, Dirghanjivitiya Adhyaya. In: Shastri K, Chaturvedi G, editors. Varanasi: Chaukhambha Bharati Academy; 2017.
7. *Sushruta Samhita*, Sharira Sthana, Garbhavyakarana Sharira Adhyaya. In: Shastri AD, editor. Varanasi: Chaukhambha Sanskrit Sansthan; 2018.
8. *Ashtanga Hridaya*, Sharira Sthana. In: Gupta A, editor. Varanasi: Chaukhambha Orientalia; 2016.
9. *Charaka Samhita*, Sutra Sthana, Vega Dharana Adhyaya. Varanasi: Chaukhambha Bharati Academy; 2017.
10. *Charaka Samhita*, Nidana Sthana, Arsha Nidana Adhyaya. Varanasi: Chaukhambha Bharati Academy; 2017.
11. *Sushruta Samhita*, Nidana Sthana, Arsha Nidana Adhyaya. Varanasi: Chaukhambha Sanskrit Sansthan; 2018.
12. *Ashtanga Hridaya*, Nidana Sthana, Arsha Nidana. Varanasi: Chaukhambha Orientalia; 2016.
13. *Sushruta Samhita*, Nidana Sthana, Bhagandara Nidana. Varanasi: Chaukhambha Sanskrit Sansthan; 2018.
14. *Charaka Samhita*, Chikitsa Sthana, Vidradhi Chikitsa. Varanasi: Chaukhambha Bharati Academy; 2017.
15. *Ashtanga Hridaya*, Chikitsa Sthana, Gudabhramsha Chikitsa. Varanasi: Chaukhambha Orientalia; 2016.
16. Goligher JC. Surgery of the Anus, Rectum and Colon. 5th ed. London: Baillière Tindall; 2000.
17. Riss S, Weiser FA, Schwameis K, et al. The prevalence of hemorrhoids in adults. Int J Colorectal Dis. 2012;27(2):215–220.
18. Schouten WR, Briel JW, Auwerda JJ. Anal fissure: new concepts in pathogenesis and treatment. Scand J Gastroenterol. 1996;31(9):1042–1047.
19. Parks AG, Gordon PH, Hardcastle JD. A classification of fistula-in-ano. Br J Surg. 1976;63(1):1–12.

20. Abcarian H. Anorectal infection: abscess–fistula. Clin Colon Rectal Surg. 2011;24(1):14–21.

21. Altomare DF, Giuratrabocchetta S. Conservative and surgical treatment of hemorrhoids. Nat Rev Gastroenterol Hepatol. 2013;10(9):513–521.

22. Maiman TH. Stimulated optical radiation in ruby. Nature. 1960;187:493–494.

23. Bonafede MM, Johnson BH, Watson C. Laser-tissue interaction and clinical applications. Lasers Med Sci. 2015;30(2):487–495.

24. *Sushruta Samhita*, Chikitsa Sthana, Agnikarma Vidhi. Varanasi: Chaukhambha Sanskrit Sansthan; 2018.

25. Giamundo P, Esercizio L, Tibaldi L, Valente M. Fistula-tract laser closure: long-term results. Tech Coloproctol. 2015;19(8):449–453.

26. Salfi R. Laser hemorrhoidoplasty: clinical outcomes and advantages. J Coloproctol. 2016;36(4):212–217.

27. Wilhelm A. A new technique for sphincter-preserving anal fistula repair using a laser probe (FiLaC). Tech Coloproctol. 2011;15(4):445–449.

28. Gupta PJ. Laser sphincterotomy for chronic anal fissure. Tech Coloproctol. 2003;7(2):87–90.

29. Dessily M, Charara F, Ralea S, Alle JL. Pilonidal sinus destruction with laser: prospective study. Lasers Med Sci. 2017;32(2):419–424.

30. Milone M, Musella M, Di Spiezio Sardo A, et al. Safety and efficacy of laser in proctologic surgery. Updates Surg. 2016;68(4):381–386.

31. Meinero P, Mori L. Endoscopic laser treatment of fistula-in-ano. World J Gastroenterol. 2014;20(36):13206–13211.

32. Brusciano L, Gambardella C, Del Genio G, et al. New trends in proctological laser surgery. Surg Innov. 2017;24(2):189–195.

33. Nienhuijs S, de Hingh I. Pain after conventional versus minimally invasive anorectal surgery. Br J Surg. 2010;97(5):721–728.

34. *Ashtanga Hridaya*, Sutra Sthana, Kshara Agnikarma Vidhi. Varanasi: Chaukhambha Orientalia; 2016.

35. Giordano P, Overton J, Madeddu F, Zuluaga R. Transanal procedures and future perspectives in proctology. Colorectal Dis. 2020;22(9):1139–1146.