

ROLE OF MEDICATED KSHARSUTRA TREATMENT FOR FISTULA IN ANO: A REVIEW ARTICLE

Dr. Deodatta Bhadlikar^{*1}, Dr. Devyani Bhadlikar², Dr. Shruti Saxena³, Dr. Archana Pandey Jumle⁴, Rahul Jumle⁵

^{*1}M.D. (Ayurveda); Ph.D. (Ayurveda); DHBTC (Diploma in Herbal Beauty Therapy & Cosmetology); DCR (Diploma in Clinical Research); PDFIIM (Post Doctoral fellow of Indian Institute of Medicine); MBA (Master of Business Administration in Healthcare Management), Fellowship Course in Ayurved for Women and Maternal Health Care Management.

²M.D. (Ayurveda); DCR (Diploma in Clinical Research), Ph.D. (Sch.).

³M.D.(Ayurveda); PGDEMS (Post Graduate Diploma in Emergency Medicine), Assistant Professor, Dept. of Agadtantra Evum Vidhivaidyaka, Sardar Ajit Singh Smriti Ayurved Mahavidyalaya, Bhopal.

⁴Associate Professor, Dept. of Prasutitantra & Strirot, Datta Meghe Ayurveda medical college, hospital & research centre, Nagpur.

⁵Associate Professor, Dept. of Kaumarbhritya (paediatric), Mahatma Gandhi Ayurved College, Hospital & Research Centre, Datta Meghe Institute of Higher Education & Research (Deemed to Be University), Salod (H), Wardha, Maharashtra, India 442001.

ABSTRACT

Background: Fistula-in-ano is a common yet challenging anorectal condition characterized by the formation of an abnormal tract between the anal canal and perianal skin, often resulting from cryptoglandular infection. Conventional surgical treatments such as fistulectomy and fistulotomy are associated with high recurrence rates, postoperative complications, and potential damage to the anal sphincter, leading to incontinence.

Objective: This review aims to explore the efficacy, methodology, and clinical advantages of the Ayurvedic technique of Ksharasutra therapy as a minimally invasive, sphincter-preserving alternative for the management of fistula-in-ano. **Methods:** The preparation of Ksharasutra involves coating a surgical linen thread with a combination of Snuhi latex (*Euphorbia neriifolia*), Apamarga Kshara (*Achyranthes aspera*), and Haridra (*Curcuma longa*) in 21 layers, providing sustained caustic, antimicrobial, and healing properties. The therapy is performed on an outpatient basis, with weekly thread

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*Corresponding Author Dr. Deodatta Bhadlikar

M.D. (Ayurveda); Ph.D. (Ayurveda); DHBTC (Diploma in Herbal Beauty Therapy & Cosmetology); DCR (Diploma in Clinical Research); PDFIIM (Post Doctoral fellow of Indian Institute of Medicine); MBA (Master of Business Administration in Healthcare Management), Fellowship course in Ayurved for Women and Maternal Health Care Management.



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changes and progressive transection of the tract. **Results:** Clinical outcomes have demonstrated near 100% cure rates in both primary and recurrent fistula cases, with minimal recurrence (<5%), preserved anal sphincter function, and reduced risk of incontinence. Ksharasutra therapy is particularly safe for patients with comorbidities such as diabetes and hypertension and has shown promising results in treating other chronic sinus conditions including pilonidal sinus, preauricular sinus, and osteomyelitic sinuses. **Conclusion:** Ksharasutra therapy offers a safe, cost-effective, and highly efficacious alternative to conventional surgery for fistula-in-ano. Its ability to simultaneously cut and heal the tract, preserve sphincter function, and avoid hospitalization makes it an ideal treatment modality, especially in resource-limited or rural healthcare settings. Further integration with modern diagnostic tools and clinical research can enhance its global acceptance.

KEYWORDS: Ksharasutra therapy, Fistula-in-ano, Ayurveda, Apamarga Kshara, Snuhi latex, Haridra.

INTRODUCTION

Fistula-in-ano is a chronic and often debilitating condition of the anorectal region characterized by the formation of an abnormal tract or tunnel between the anal canal and the perianal skin. It commonly results from a cryptoglandular infection in the intersphincteric anal glands, which progresses to form an abscess and eventually drains externally, creating a fistulous tract. While this condition is frequently encountered in surgical practice, its effective management continues to be a clinical challenge due to high rates of recurrence, delayed healing, and the risk of complications such as fecal incontinence, particularly when the internal and external anal sphincters are involved.

The conventional surgical treatment for fistula-in-ano primarily includes procedures like fistulectomy (complete excision of the tract) or fistulotomy (laying open of the tract). While these methods aim to eradicate the fistulous pathway and promote healing, they are often associated with significant postoperative morbidities, including pain, bleeding, wound infection, delayed wound healing, and most importantly, a high risk of recurrence—which may be as high as 20–30% in complex cases. Furthermore, procedures involving high or multiple tracts that pass through or near the sphincter muscles carry the additional risk of anal sphincter damage, leading to varying degrees of fecal incontinence and compromised quality of life.

In contrast to these modern surgical approaches, the ancient Indian system of medicine—Ayurveda—has long advocated a non-invasive technique using a medicated thread called Ksharasutra, which offers a more conservative, sphincter-sparing, and sustainable option for the management of fistula-in-ano. This technique is meticulously described in the classical Ayurvedic treatise Sushruta Samhita, attributed to the ancient Indian surgeon Acharya Sushruta, who is widely considered the "Father of Surgery." As early as 1000–600 B.C., Sushruta recommended the use of Ksharasutra for treating *bhagandara* (the Ayurvedic term for fistula-in-ano), recognizing its ability to simultaneously cut through the tract and promote natural healing with minimal tissue damage.

Ksharasutra therapy involves the gradual cutting, debridement, and healing of the fistulous tract using a specially prepared medicated thread coated with a combination of herbal alkalis and powders known for their **antimicrobial**, **anti-inflammatory**, and cauterizing properties. The thread is periodically changed (usually once a week), allowing progressive transection of the tract without compromising the anal sphincter's integrity.

In recent decades, this time-tested technique has been scientifically revived and clinically validated, gaining attention for its impressive success rates in both primary and recurrent fistula cases. Clinical studies and institutional practices have demonstrated that Ksharasutra therapy significantly reduces recurrence, improves wound healing, preserves sphincter function, and can be performed safely on an outpatient basis without the need for general anesthesia or prolonged hospitalization.

Given its unique advantages—such as minimal invasiveness, low complication rates, cost-effectiveness, and the ability to treat even complex or high-level fistulas—Ksharasutra therapy is increasingly being recognized as a viable alternative or adjunct to conventional surgical treatments. It holds particular promise in patients who are at high risk for surgery or who have already experienced surgical failure.

This review aims to explore the historical basis, preparation methodology, clinical application, advantages, and contemporary relevance of Ksharasutra therapy in the treatment of fistula-in-ano, with an emphasis on its mechanism of action, clinical efficacy, and integration with modern medical practices.

METHODOLOGY

Preparation of Ksharasutra

Ksharasutra is a specially medicated thread used in the treatment of anorectal conditions such as fistula-in-ano, sinus tracts, and chronic abscesses. The preparation of the Ksharasutra is a meticulous and standardized process that ensures the delivery of sustained caustic, antimicrobial, and healing effects during the therapy.

1. Materials Used

- Base thread: Surgical-grade linen thread (Barbour No. 20) is selected for its tensile strength, uniformity, and ability to hold multiple coatings without fraying or breaking. The thread is first sterilized before use.
- Medicinal Coatings: Three primary ingredients are used for coating the thread:
 - Snuhi latex (*Euphorbia neriifolia*): This is a milky, sticky latex extracted from the cut stems of the Snuhi plant. It acts as a binding agent and also possesses mild caustic and antimicrobial properties.
 - Apamarga Kshara (*Achyranthes aspera*): A strong alkaline ash obtained from the incinerated whole plant. It acts as a potent caustic agent, facilitating debridement and chemical cauterization of the infected tissue.
 - Haridra powder (*Curcuma longa*): Finely powdered turmeric rhizome is used for its known anti-inflammatory, antimicrobial, and wound-healing properties.

2. Coating Procedure

The coating process involves a total of 21 coatings applied to the thread in a stepwise and alternating fashion:

- First 11 coatings: Fresh Snuhi latex is applied repeatedly and dried, forming the base layer.
- Next 7 coatings: A mixture of Snuhi latex and Apamarga Kshara is applied, providing the alkaline properties necessary for cauterization.
- Final 3 coatings: A blend of Snuhi latex and Haridra powder is added to aid healing and prevent infection.

After each coating, the thread is dried in a sterile environment inside a specially designed Ksharasutra cabinet equipped with ultraviolet (UV) light, which not only helps in drying but

also ensures surface sterilization. The pH of the final product is maintained at approximately 9.25, ensuring optimal caustic strength without excessive tissue damage.

Once all 21 coatings are applied and dried, the Ksharasutra threads are individually packed in sterile glass or polythene tubes, sealed, and labeled for clinical use.

Pre-application Assessment

Before initiating the Ksharasutra therapy, a comprehensive clinical evaluation of the patient is carried out to determine the nature and complexity of the fistulous tract. This includes:

1. Clinical Examination

Digital Rectal Examination (DRE): To palpate the internal opening, assess the sphincter tone, and estimate the length and direction of the tract.

- Proctoscopy: To visually inspect the rectal mucosa and identify the internal opening if accessible.

2. Imaging Investigations

In complex, high, or multiple branching fistulas where probing is inconclusive, fistulography or sinography using double contrast balloon techniques is employed. This imaging technique helps delineate the course of the tract, identify secondary extensions or abscess cavities, and aids in planning the placement of the Ksharasutra.

3. Patient Assessment

General health evaluation is done to assess fitness for the procedure, although most patients are treated on an outpatient basis. Special care is taken in patients with comorbidities like diabetes or cardiovascular disease to ensure optimal safety.

Application Procedure

The application of Ksharasutra is a minimally invasive procedure and is generally performed without the need for general anesthesia.

Step-by-Step Technique:

1. Positioning: The patient is placed in the lithotomy position. Mild analgesia and local anesthesia may be administered depending on the patient's sensitivity.

2. Probing the Tract

- A malleable, blunt-tipped probe is gently introduced into the external fistulous opening.

- a. Using digital guidance (a finger inserted into the rectum), the probe is advanced to trace the fistulous tract towards the internal opening.
- b. Care is taken to avoid forceful manipulation to prevent the creation of false passages.

3. Identification of the Internal Opening:

- a. If the internal opening is identified and the tract is negotiable, the probe is passed through the internal opening into the rectum.
- b. In cases where the internal opening cannot be accessed, a Ksharasutra is loosely packed into the external tract (known as Ksharasutra verti-packing) to allow drainage and gradual dilation of the tract. This process may be repeated for a few sessions until complete tract access is achieved.

4. Thread Insertion

- a. Once the tract is fully negotiated, the eye of the probe is threaded with the prepared Ksharasutra.
- b. The probe is then withdrawn, pulling the thread through the entire length of the fistulous tract.
- c. The two ends of the thread (emerging from the anal canal and the external opening) are tied externally with three secure knots, ensuring the thread encircles the entire tract.

5. Post-procedure Care:

- a. The area is cleansed with antiseptic solution.
- b. A sterile dressing is applied along with medicated oil or ghrita (Ayurvedic ghee-based formulations) to promote healing.
- c. A tetanus toxoid (TT) injection is administered as a prophylactic measure if not already up to date.

Post-procedure Management

- Thread Change: Ksharasutra is generally replaced once every 7 days. Clinical observations indicate that the thread retains maximum potency for 3–5 days, after which its caustic strength diminishes.
 - A railroad technique is employed during thread replacement, wherein the new Ksharasutra is tied to the old one and pulled through the tract in one smooth motion.

- **Duration of Therapy:** The thread gradually cuts through the tract while promoting healing from within. The complete treatment may take 4–8 weeks depending on the length and complexity of the tract.
- **Patient Instructions:**
 - Regular hot sitz baths (lukewarm water baths for the perianal region) are advised twice daily or after bowel movements to maintain hygiene and relieve discomfort.
 - Patients are encouraged to consume adequate fluids and a fiber-rich diet to ensure smooth bowel movements.
 - Mild laxatives or Ayurvedic bowel regulators may be prescribed.
 - Patients are typically ambulatory throughout the treatment period and can carry on with their routine activities, as moderate physical activity supports drainage and wound healing.

RESULTS

Ksharasutra therapy has demonstrated consistently positive outcomes in the management of fistula-in-ano, offering distinct advantages over conventional surgical interventions. Clinical studies, observational trials, and institutional experiences have highlighted its efficacy, safety, and patient-centered benefits.

1. High Cure Rates in Primary and Recurrent Cases

Numerous clinical reports indicate near 100% cure rates with Ksharasutra therapy, especially when the treatment is appropriately planned and executed. It has been found to be equally effective in both primary fistulae and recurrent cases—the latter being notoriously resistant to standard surgical techniques. The ability of the medicated thread to chemically cauterize the infected tract, eliminate the nidus of infection, and allow natural healing significantly reduces the likelihood of treatment failure.

2. Minimal Recurrence

A key advantage of this therapy is its ability to destroy the cryptoglandular tissue—the root cause of most fistula-in-ano cases. The alkaline action of the Ksharasutra leads to:

- Continuous debridement of infected and necrotic tissue.
- Elimination of residual pus pockets or secondary tracts.
- Neutralization of the internal opening and epithelialized tract lining.

As a result, recurrence rates with Ksharasutra are exceedingly low, often under 2–5%, compared to 15–30% seen with surgical methods, especially in complex or high fistulas.

3. Simultaneous Cutting and Healing

One of the unique features of Ksharasutra therapy is its ability to cut through the tract gradually, while simultaneously promoting healing of the tissues behind the cutting edge. This dual action ensures:

- Reduced local trauma and minimal bleeding.
- Avoidance of open wounds or raw surgical sites.
- Controlled progression through the fistulous path, even if it traverses through deeper planes.

This mechanism also reduces the chances of secondary infection, as the tract remains sealed by the thread and drains continuously.

4. No Hospitalization Required

Ksharasutra treatment is typically conducted on an outpatient basis, eliminating the need for hospital admission, general anesthesia, or prolonged postoperative care. Patients can return home the same day and resume routine activities with minimal disruption. This outpatient approach:

- Reduces healthcare costs significantly.
- Avoids nosocomial infections.
- Is particularly beneficial in resource-limited settings or rural healthcare centers.

5. Safe for Patients with Comorbid Conditions

Conventional fistula surgery often poses risks for patients with chronic comorbidities such as:

- Hypertension
- Diabetes mellitus
- Cardiovascular disease
- Renal insufficiency

However, due to its minimally invasive nature and lack of general anesthesia, Ksharasutra therapy can be safely administered in these high-risk populations. With proper blood sugar and blood pressure control, these patients tolerate the treatment well, and healing is comparable to that in otherwise healthy individuals.

6. Preservation of Anal Sphincter Function

A major complication of fistula surgery, particularly when high tracts or multiple branches are involved, is incontinence, arising from damage to the internal or external anal sphincter. Ksharasutra therapy, however, ensures gradual division of the sphincter fibers. By the time the thread cuts through the deeper part of the muscle, the previously severed fibers begin to heal and regain tensile strength. This overlapping process of cutting and concurrent healing ensures:

- Preservation of sphincteric tone
- Maintenance of continence
- Normal bowel control, even in complex cases

This feature makes Ksharasutra particularly useful for trans-sphincteric and high fistulae, which pose a surgical dilemma due to the risk of incontinence.

7. Applicability Beyond Fistula-in-Ano

While primarily used for fistula-in-ano, the principles of Ksharasutra therapy—chemical debridement, continuous drainage, and staged healing—have been successfully extrapolated to other chronic discharging sinuses and tract conditions. Studies and case series have reported excellent results in:

- Pilonidal sinus: Avoids surgical excision and extensive healing time.
- Preauricular sinus: Prevents recurrence with complete tract eradication.
- Injection abscess-related sinuses: Provides a non-surgical drainage pathway with healing.
- Chronic osteomyelitic sinuses: Assists in tract resolution along with systemic antibiotic therapy.

This expanded applicability highlights the versatility and adaptability of Ksharasutra therapy across multiple specialties, including proctology, dermatology, and orthopedics.

DISCUSSION

The revival of Ksharasutra therapy marks a significant advancement in the non-surgical management of fistula-in-ano. It aligns with the Ayurvedic principles of natural healing while incorporating modern sterilization and procedural techniques.

The mechanism of action combines the mechanical pressure of the thread with the chemical cauterization from its medicinal coatings, leading to effective debridement, continuous drainage, and gradual healing. This results in controlled fistulotomy with minimal tissue damage and no loss of sphincteric function.

Despite a longer duration of treatment, Ksharasutra therapy is highly acceptable due to its outpatient nature and minimal side effects. Moreover, it is cost-effective, safe, and requires minimal medical infrastructure, making it suitable for wider application, especially in resource-limited settings.

CONCLUSION

Ksharasutra therapy is a safe, effective, and minimally invasive treatment for fistula-in-ano. With negligible recurrence rates, preserved sphincter function, and suitability for comorbid patients, it stands out as a superior alternative to conventional surgical methods. Continued clinical studies and integration with modern diagnostics can further enhance its acceptance in mainstream medical practice.

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