

A CLINICAL CASE STUDY ON THE EFFICACY OF *KADALI KSHARA SUTRA* IN *BHAGANDARA* (FISTULA-IN-ANO)

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ABSTRACT

Background: *Bhagandara*, described in Ayurvedic literature and clinically correlated with Fistula-in-Ano, is a chronic anorectal disorder characterized by persistent infection and discharge through an abnormal fistulous tract. Despite advances in contemporary surgical management, treatment may be challenging, particularly in fistulas involving a significant proportion of the anal sphincter, where preservation of continence remains an important consideration. *Kshara Sutra* therapy is an established Ayurvedic parasurgical procedure that facilitates gradual cutting and healing of the fistulous tract.

Case Presentation: The present case study evaluates the clinical outcome of *Kadali Kshara Sutra*, prepared using alkali derived from *Kadali* (*Musa paradisiaca*), in the management of *Bhagandara* (Fistula-in-Ano). The medicated thread was introduced through the fistulous tract using a standard ligation

technique and changed at regular intervals until complete tract cutting and healing were achieved. Clinical parameters, including pain, fistulous discharge, induration, wound status, and healing progression, were assessed during follow-up. **Results:** Progressive clinical improvement was observed during the treatment period, with a gradual reduction in pain, discharge, and induration. The fistulous tract underwent progressive cutting with simultaneous tissue healing, followed by satisfactory wound closure. No recurrence or clinically evident impairment of continence was observed during the available follow-up period. **Conclusion:** This case demonstrates the potential clinical utility of *Kadali Kshara Sutra* as a minimally invasive parasurgical approach in the management of *Bhagandara*

(Fistula-in-Ano). The observed progressive tract cutting and healing suggest that *Kadali Kshara Sutra* may be a useful therapeutic option in appropriately selected cases. However, larger prospective studies with standardized outcome measures and longer follow-up are required to establish its efficacy and safety more conclusively.

KEYWORDS: *Bhagandara*; Fistula-in-Ano, *Kadali Kshara Sutra*, *Musa paradisiaca*, *Kshara Sutra*, Ayurveda, Case Report.

INTRODUCTION

Bhagandara is described in the classical Ayurvedic texts as one of the *Ashta Mahagada* (eight major or grave diseases) and is generally correlated with Fistula-in-Ano in contemporary surgical practice. The condition is characterized by the formation of an abnormal tract between the anorectal lumen and the perianal skin, usually developing as a consequence of persistent infection and suppuration in the perianal tissues. The chronic nature of the disease, recurrent discharge, pain, and the possibility of recurrence make its management a significant clinical challenge.

Fistula-in-ano can be described as a persistent abnormal tract lined by granulation tissue that establishes a communication between the anorectal lumen through an internal opening and the perineal or adjacent skin through one or more external openings. The external opening may occasionally extend to the gluteal, genital, thigh, or even abdominal regions.

Acharya Sushruta provided a detailed description of *Bhagandara* and related fistulous disorders and advocated surgical and parasurgical approaches for their management. *Kshara* and *Kshara Sutra* have an important place in the Ayurvedic surgical tradition and have subsequently been investigated as therapeutic modalities for fistulous disorders. The therapeutic principle of *Kshara Sutra* involves the gradual chemical and mechanical action of a medicated thread placed within the fistulous tract, facilitating progressive tract cutting along with tissue healing.

In contemporary surgical practice, the management of Fistula-in-Ano is primarily determined by the anatomy of the fistulous tract and its relationship to the anal sphincter complex. Treatment options include fistulotomy, fistulectomy, seton placement, advancement flap procedures, ligation of the intersphincteric fistula tract, and other sphincter-preserving techniques. Although fistulotomy provides high healing rates in appropriately selected low

fistulas, division of a substantial portion of the sphincter complex may increase the risk of postoperative continence disturbance. Therefore, achieving definitive fistula healing while minimizing sphincter injury remains an important therapeutic objective.

Conventional *Kshara Sutra* is traditionally prepared by repeated coatings of *Snuhi Ksheera* (latex of *Euphorbia neriifolia*), *Apamarga Kshara*, and *Haridra Churna* (*Curcuma longa*). The combination provides the thread with alkaline, debriding, and tissue-healing properties. The gradual action of the thread allows progressive cutting of the fistulous tract while permitting healing to occur behind the advancing thread.

However, the use of alternative *Kshara* sources has been described in the Ayurvedic literature and explored in subsequent research. *Kadali* (*Musa paradisiaca*), commonly known as the banana plant, is one such source of plant-derived alkali described in the context of *Kshara* preparation. The use of *Kadali Kshara* in *Kshara Sutra* has attracted clinical interest because it provides an alternative source of alkali for preparation of the medicated thread.

Clinical studies and case reports have reported encouraging outcomes with *Kshara Sutra* in the management of *Bhagandara* (Fistula-in-Ano), including progressive reduction in discharge, tract healing, and satisfactory postoperative outcomes.^[2-3] However, clinical documentation specifically evaluating *Kadali Kshara Sutra* remains relatively limited compared with the conventional *Kshara Sutra*. Consequently, further clinical documentation is warranted to assess its therapeutic potential and clinical applicability.

The present case study was undertaken to document the clinical outcome of *Kadali Kshara Sutra* in a patient with *Bhagandara* (Fistula-in-Ano). Particular attention was given to changes in pain, fistulous discharge, induration, tract cutting, wound healing, and recurrence during follow-up. The case is presented to contribute to the existing clinical literature on the use of *Kadali Kshara Sutra* as an Ayurvedic parasurgical intervention for Fistula-in-Ano.

CASE PRESENTATION

A 20-year-old male patient presented with intermittent purulent discharge and mild pain from a perianal opening for 15 days. Local examination revealed a single external opening at the 5 o'clock position, approximately 3 cm from the anal verge, with mild tenderness and induration. The internal opening was identified at the 6 o'clock position. Digital rectal examination was otherwise unremarkable. The patient was clinically diagnosed with Fistula-

in-Ano (*Bhagandara*). Routine investigations were within normal limits. After obtaining informed consent, the patient was managed according to the planned treatment protocol and followed up regularly.

Method of *Kshara Sutra* Preparation

Barbour's surgical linen threads (No. 20) were mounted longitudinally on *Kshara Sutra* hangers. *Snuhi Ksheera* was uniformly smeared over the threads using sterile gloves under aseptic conditions and dried in a *Kshara Sutra* cabinet for one day. This procedure was repeated for 11 consecutive days.

On the 12th day, *Snuhi Ksheera* was applied and, while the thread was wet, *Kadali Kshara* powder was uniformly coated over it. The same procedure was repeated for 7 consecutive days. From the 19th day, *Snuhi Ksheera* was applied followed by *Haridra Churna* coating, and this procedure was repeated for 3 consecutive days.

Thus, each prepared *Kshara Sutra* received a total of 21 coatings of *Snuhi Ksheera*, 7 coatings of *Kadali Kshara*, and 3 coatings of *Haridra Churna*. The prepared *Kshara Sutra* was stored in a vertical *Kshara Sutra* cabinet until use.

Ingredients	Latin Name	pH
<i>Snuhi Ksheera</i>	<i>Euphorbia neriifolia</i> L.	5.7
<i>Kadali Kshara</i>	<i>Musa paradisiaca</i> L.	11.33
<i>Haridra Powder</i>	<i>Curcuma longa</i> L.	6.4

Method of Application of *Kadali Kshara Sutra*

The patient was placed in the lithotomy position, and the perianal region was cleaned with an antiseptic solution under aseptic precautions. For relaxation of the anal sphincter, local fomentation was performed using Nadi Sweda Yantra. The external opening at the 5 o'clock position was identified, and a probe was gently introduced through the fistulous tract. The probe was guided towards and identified the internal opening at the 6 o'clock position in the anal canal. The *Kadali Kshara Sutra* was then threaded through the eye of the probe. The probe was carefully withdrawn through the anal canal, leaving the *Kshara Sutra* in situ along the entire fistulous tract. The ends of the *Kshara Sutra* were tied securely.

Inclusion Criteria

- Patients diagnosed clinically with Fistula-in-Ano (*Bhagandara*).
- Patients of either sex aged 18–60 years.

- Patients with a clinically identifiable external and internal opening.
- Patients willing to undergo *Kadali Kshara Sutra* therapy and provide written informed consent.

Exclusion Criteria

- Patients with fistula associated with Crohn's disease, ulcerative colitis, tuberculosis, or malignancy.
- Patients with recurrent fistula requiring complex surgical management.
- Patients with multiple or complicated fistulous tracts.
- Patients unwilling to participate or unable to comply with the follow-up schedule.
- Patients with severe systemic illness or conditions contraindicating the procedure.

Chief Complaints and Duration

In the present case study, a 20-year-old male patient presented to the OPD of Shalya Tantra with chief complaints of pain and purulent discharge from the perianal region for the past 15 Days.

Personal History

There was no history of hypertension, diabetes mellitus, or any other significant chronic illness. There was no history of previous anorectal surgery or any similar major illness.

Family History

There was no history of similar complaints or anorectal disease among the family members.

General Examination

On general examination, the patient was conscious, oriented, and cooperative. He was moderately built and nourished. His pulse rate was 76/min, blood pressure was 118/76 mmHg, respiratory rate was 18/min, and body temperature was 98.4°F. There was no evidence of pallor, icterus, cyanosis, clubbing, lymphadenopathy, or pedal edema. The patient was afebrile and haemodynamically stable.

Local Examination

Local examination was performed with the patient in the lithotomy position. Inspection revealed a single external opening in the perianal region, approximately 3 cm from the anal verge at the 5 o'clock position, with minimal purulent discharge. On gentle probing, the fistulous tract was traced towards the anal canal, and the internal opening was identified at

the 6 o'clock position. Proctoscopic examination showed no associated anorectal pathology, including haemorrhoids or fissure-in-ano. The surrounding perianal skin appeared normal, without evidence of dermatitis, excoriation, or inflammation. Based on the clinical examination and probing findings, the case was diagnosed as Fistula-in-Ano (*Bhagandara*).

Investigations

The patient underwent routine investigations, including complete blood count (CBC), erythrocyte sedimentation rate (ESR), random blood sugar (RBS), HIV, hepatitis C virus (HCV), and hepatitis B surface antigen (HBsAg). All investigated parameters were within normal limits, and HIV, HCV, and HBsAg screening tests were non-reactive.

Treatment Given

After clinical assessment, the patient was counselled regarding the *Kadali Kshara Sutra* procedure, and written informed consent was obtained. The procedure was performed under local anaesthesia with the patient in the lithotomy position. The perianal region was prepared with 5% povidone-iodine solution under aseptic precautions. Following adequate local anaesthesia, the fistulous tract was gently explored with a probe. The external opening was located at the 5 o'clock position, approximately 3 cm from the anal verge, while the internal opening was identified at the 6 o'clock position within the anal canal.

The *Kadali Kshara Sutra* was introduced through the fistulous tract using the rail-road technique and secured in situ. Adequate haemostasis was achieved, and the patient was monitored following the procedure.

The patient was advised to maintain proper bowel habits and perianal hygiene and to take warm-water sitz baths regularly. The *Kshara Sutra* was changed at weekly intervals using the rail-road technique until complete cutting and healing of the fistulous tract were achieved. The initial length of the fistulous tract was approximately 4 cm, and complete cutting of the tract was achieved in 55 days.



Primary threading of Barbour's thread through the fistulous tract.



Complete cutting through of the fistulous tract following Kadali Kshara Sutra.

Unit Cutting Time (UCT)

Formula

$$UCT = \frac{\text{Total time taken for complete cutting (days)}}{\text{Initial length of fistulous tract (cm)}}$$

Calculation

- Initial fistulous tract length = 4 cm
- Total time taken for complete cutting = 55 days

$$UCT = \frac{55}{4}$$

$$UCT = 13.75 \text{ days/cm}$$

UCT = 13.75 days/cm indicates that the *Kadali Kshara Sutra* required an average of 13.75 days to cut through 1 cm of the fistulous tract. In the present case, the 4 cm long fistulous tract was completely cut and healed within 55 days. A lower UCT indicates a faster rate of tract cutting, whereas a higher UCT indicates a slower rate of cutting.

The Unit Cutting Time (UCT) was 13.75 days/cm, indicating that approximately 13.75 days were required to cut 1 cm of the fistulous tract. The complete 4 cm fistulous tract was successfully cut and healed within 55 days following Kadali Kshara Sutra therapy.

DISCUSSION

Bhagandara, correlated with *Fistula-in-Ano*, remains one of the most challenging anorectal conditions to manage due to its chronic, recurrent nature and the delicate balance required

between complete eradication of the tract and preservation of sphincter function. While conventional surgical techniques such as fistulotomy offer high success rates in low, simple fistulas, they carry an inherent risk of continence disturbance when a significant portion of the sphincter complex is involved. *Kshara Sutra* therapy, as a parasurgical modality rooted in classical Ayurvedic surgery, addresses this concern through its principle of gradual, simultaneous cutting and healing, allowing the tract to be eliminated while fibrous tissue forms behind the advancing thread, thereby minimizing the risk of incontinence.

In the present case, the use of *Kadali Kshara Sutra*—prepared using alkali derived from *Musa paradisiaca* in place of, or in combination with, the conventionally used *Apamarga Kshara*—demonstrated a favourable clinical course. The pH of *Kadali Kshara* used in this preparation was recorded at 11.33, reflecting its strong alkaline nature, which is likely responsible for its debriding, escharotic, and tissue-penetrating action on the fistulous tract. This alkalinity, combined with the proteolytic and wound-healing properties of *Snuhi Ksheera* and the antimicrobial, anti-inflammatory action of *Haridra Churna*, appears to have acted synergistically to produce progressive chemical cutting of the tract alongside granulation tissue formation.

The clinical parameters monitored during the course of therapy—pain, discharge, induration, and wound status—showed a steady and progressive improvement, without any episode of acute exacerbation, excessive bleeding, or systemic complication. The complete cutting of a 4 cm fistulous tract within 55 days, corresponding to a Unit Cutting Time (UCT) of 13.75 days/cm (equivalent to a cutting rate of approximately 0.51 cm/week), is broadly comparable to cutting rates reported for *Kshara Sutra* preparations using other alkaline sources in the existing literature.^{4,6,7} This suggests that *Kadali Kshara*, despite being a comparatively less-studied alternative, may possess a cutting efficiency similar to that of conventionally used *Ksharas*, while offering the added advantage of being derived from a widely available, low-cost, and easily processed plant source.

Importantly, no clinically evident impairment of continence was observed at the end of the follow-up period, supporting the premise that the slow, staged nature of *Kshara Sutra* therapy allows adequate time for fibrosis and healing to keep pace with tract division, unlike a single-stage surgical cut. The absence of recurrence during the follow-up period further supports the therapeutic adequacy of this approach in a simple, low-type fistula with clearly identifiable external and internal openings.

However, certain limitations of this report must be acknowledged. As a single case study, the findings cannot be generalized to all presentations of *Bhagandara*, particularly complex, high, or recurrent fistulas, or those associated with underlying systemic conditions such as Crohn's disease or tuberculosis, which were specifically excluded from consideration. The follow-up duration, though adequate to demonstrate complete healing, may not be sufficient to detect long-term or delayed recurrence, which is a recognized possibility with any fistula treatment modality. Additionally, the absence of objective anorectal manometry or a standardized continence scoring tool limits the strength of the claim regarding preserved sphincter function, which was assessed only clinically in this case.

Despite these limitations, this case adds to the relatively sparse clinical documentation available on *Kadali Kshara Sutra* specifically, as distinct from the more extensively studied *Apamarga*-based *Kshara Sutra*. It reinforces the broader body of evidence suggesting that *Kshara Sutra* therapy, irrespective of the specific alkaline source used in its preparation, offers a viable, minimally invasive, sphincter-preserving alternative to conventional fistula surgery, particularly relevant in resource-limited settings where the raw materials for *Kadali Kshara* are inexpensive and readily accessible.

CONCLUSION

This case study demonstrates the successful and safe use of *Kadali Kshara Sutra* in the management of a case of *Bhagandara* (Fistula-in-Ano), with progressive reduction in pain, discharge, and induration, complete tract cutting achieved within 55 days, and satisfactory wound healing without recurrence or clinically detectable impairment of continence during follow-up. The Unit Cutting Time observed in this case indicates that *Kadali Kshara Sutra* can achieve a clinically meaningful and comparable rate of tract division to that reported with conventional *Kshara Sutra* preparations, while offering the additional benefit of utilizing an easily available and cost-effective plant-derived alkali. These findings support the therapeutic potential of *Kadali Kshara Sutra* as a minimally invasive, sphincter-sparing parasurgical option for the management of *Fistula-in-Ano*, particularly in simple, low-type fistulas. Nonetheless, being based on a single case, these observations remain preliminary. Larger, well-designed prospective and comparative clinical studies with standardized outcome measures, objective continence assessment, and extended follow-up are warranted to more conclusively establish the efficacy, safety, and reproducibility of *Kadali Kshara Sutra* as a

standard therapeutic alternative in the Ayurvedic and integrative management of *Bhagandara*.

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