

Review Article

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“KSHARA SUTRA IN FISTULA-IN-ANO: A REVIEW OF CLASSICAL BASIS, TECHNIQUE AND CLINICAL EVIDENCE”**Dr. Abhay Gandhi¹****AFFILIATIONS:**

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ABSTRACT

Background: Fistula-in-ano (Bhagandara) is a common anorectal condition with high recurrence and a risk of faecal incontinence after surgery. Kshara Sutra, a thread coated with alkaline and herbal preparations described by Sushruta, is a minimally invasive Ayurvedic seton technique that cuts and heals the fistula tract gradually. **Objective:** To review the classical basis, preparation and technique of Kshara Sutra and the clinical evidence comparing it with conventional surgery. **Methods:** Narrative review of Sushruta Samhita and of clinical trials, a meta-analysis and surgical guidelines identified through PubMed, Google Scholar and Indian databases. **Results:** Sushruta described the use of Kshara-coated thread for Nadi Vrana (sinus) and Bhagandara. The modern standardised Kshara Sutra, developed at Banaras Hindu University, is coated 21 times with Snuhi latex, Apamarga Kshara and Haridra. A multicentric randomised trial by the Indian Council of Medical Research reported lower recurrence with Kshara Sutra than with conventional surgery. In a Singapore trial, Kshara Sutra produced more early postoperative pain but similar healing and continence to fistulotomy. An Indian randomised trial found less severe pain, shorter hospital stay, earlier return to work and lower cost with Kshara Sutra, but longer healing time. A 2024 meta-analysis of seven studies reported high cure rates and negligible incontinence. **Conclusion:** Kshara Sutra is a safe, low-cost, sphincter-preserving option for fistula-in-ano, particularly for low and simple fistulas, with recurrence rates comparable to or lower than fistulotomy. Larger trials in complex fistulas, with standardised outcome reporting and long follow-up, are needed.

KEYWORDS: Kshara Sutra; Bhagandara; fistula-in-ano; seton; Apamarga Kshara; Snuhi; Sushruta; anorectal surgery

INTRODUCTION

Fistula-in-ano is an abnormal tract connecting the anal canal to the perianal skin, usually arising from infection of the anal glands. It causes recurrent discharge, pain and discomfort, and considerable impact on quality of life. A population-based study in Finland estimated an incidence of about 9 per 100,000 per year, with a male predominance^[1]. Most fistulas are cryptoglandular in origin, arising from infected anal glands^[2]. Surgical management must balance two competing goals: eradicating the tract to prevent recurrence and preserving the anal sphincters to maintain continence^[3,4].

Fistulotomy, laying open the tract, has high cure rates for low fistulas but risks incontinence when significant sphincter muscle is divided. Patient satisfaction after fistula surgery is strongly influenced by continence outcomes^[5]. Many sphincter-preserving procedures have been developed, including setons, advancement flaps, fibrin glue, fistula plugs and the ligation of intersphincteric fistula tract (LIFT) procedure^[4,6]. Each has its own trade-offs between healing rates, recurrence and continence.

Kshara Sutra is an Ayurvedic seton technique with roots in the Sushruta Samhita. A medicated thread is passed through the tract and changed weekly; the alkaline coating chemically cuts and debrides the tract while healing follows behind. It has been widely used in India for decades and has been evaluated in randomised trials, including a multicentric trial by the Indian Council of Medical Research (ICMR)^[7]. This review summarises its classical basis, preparation, technique and clinical evidence.

METHODS

Classical sources were Sushruta Samhita (Nidana Sthana 4, Chikitsa Sthana 8 and 17)^[8]. Clinical literature was identified through PubMed, Google Scholar, the Digital Helpdesk of Indian Medicine

and Ayurveda journals using Kshara Sutra, Ksharasutra, medicated seton, Ayurvedic seton, Bhagandara and fistula-in-ano. Randomised trials, a meta-analysis and surgical guidelines were prioritised. This is a narrative review.

CLASSICAL BASIS

Bhagandara in Sushruta Samhita

Sushruta describes Bhagandara as one of the eight difficult-to-treat diseases (Ashtamahagada) and classifies it into five types according to Dosha and cause: Shatapona (Vata), Ushtragriva (Pitta), Parisravi (Kapha), Shambukavarta (Sannipata) and Unmargi (traumatic)^[8]. These types describe features such as multiple openings, discharge, pain and the direction of the tract that correspond to different presentations of fistula-in-ano.

Kshara and Kshara Sutra

Kshara (alkali) is described by Sushruta as superior to surgical and other instruments because it performs incision, excision and scraping, balances the Doshas and can be used where instruments cannot reach^[8]. In the treatment of Nadi Vrana (sinus), Sushruta recommends passing a thread smeared with Kshara through the tract and tying it, especially for weak or fearful patients and where the tract is in a delicate location^[8]. This is the classical origin of Kshara Sutra.

Modern standardisation

The modern standardised Kshara Sutra was developed by Deshpande and colleagues at Banaras Hindu University in the 1960s and 1970s and reported in a series of 200 cases^[9]. A surgical linen thread (Barbour's thread) is coated in three stages:

The coated thread is dried and sterilised. Snuhi latex acts as a binder and has proteolytic and irritant properties; Apamarga Kshara provides chemical cauterisation and debridement; Haridra contributes antimicrobial and anti-inflammatory effects. Variants using Guggulu, Gomutra-based Kshara or other herbs have also been developed.

Table 1: Coating stages in the preparation of Kshara Sutra

Coating stage	Material	Number of coats
1	Latex of Snuhi (<i>Euphorbia nerifolia</i>)	11
2	Snuhi latex followed by Apamarga Kshara (alkali from <i>Achyranthes aspera</i>)	7

Coating stage	Material	Number of coats
3	Snuhi latex followed by Haridra (Curcuma longa) powder	3
Total		21

TECHNIQUE

Procedure

Under local, regional or general anaesthesia, the fistula is probed from the external opening to the internal opening. A Kshara Sutra is attached to the probe and drawn through the tract, and its ends are tied outside with moderate tension. The patient is usually discharged the same day or the next day.

Follow-up and thread change

The thread is changed weekly using a rail-road technique: a new thread is tied to the old one and pulled through. With each change, the tract shortens as the Kshara cuts through the tissue while healing proceeds from the depth. The rate of cutting is measured as the unit cutting time (UCT), the number of days taken to cut through one centimetre of tract, typically around one week per centimetre. Treatment continues until the thread cuts through completely.

Mode of action

Kshara Sutra acts through several mechanisms: chemical cauterisation and debridement of unhealthy tissue in the tract; drainage of the tract, preventing pus accumulation; gradual mechanical cutting through the tissue, which allows the sphincter muscle to heal behind the thread with fibrosis rather than separating; and antimicrobial and anti-inflammatory effects of the coating. The slow cutting is the key to sphincter preservation, similar to the principle of the conventional cutting seton.

CLINICAL EVIDENCE

ICMR multicentric trial

The ICMR conducted a multicentric randomised controlled trial comparing Kshara Sutra with conventional surgery in fistula-in-ano at several centres in India^[7]. The trial reported a lower recurrence rate with Kshara Sutra than with surgery

Summary of key studies

at follow-up, with treatment taking longer because of weekly thread changes. This trial is the foundation of the evidence base for Kshara Sutra and contributed to its acceptance in Indian surgical practice.

Singapore randomised trial

In a randomised trial in Singapore, 108 patients with low fistula-in-ano were randomised to fistulotomy or Ayurvedic cutting seton, with 54 and 46 patients analysed respectively^[10]. Patients in the seton group reported more pain after surgery and on postoperative days two to four, after which pain was similar. Healing time and functional outcome, including continence score, did not differ between groups. This trial is important because it was conducted by colorectal surgeons outside India and showed that Kshara Sutra performed comparably to fistulotomy for low fistulas.

Indian randomised trial

In a randomised trial in Kolkata, 50 patients were assigned to Kshara Sutra or open fistulotomy^[11]. Severe postoperative pain occurred in 7.7% of the Kshara Sutra group and 25% of the fistulotomy group. Kshara Sutra patients had shorter hospital stay, took far fewer days off work (2.7 versus 15.5 days) and incurred lower cost, but their healing took longer (mean 53 versus 36 days). Recurrence was 3.8% with Kshara Sutra and 12.5% with fistulotomy, although the authors noted that the small sample limited this comparison.

Meta-analysis

A 2024 meta-analysis of seven studies published between 2000 and 2023 reported high cure rates with Kshara Sutra, with negligible recurrence and anal incontinence, and judged most included studies to be of good quality on the Jadad scale^[12]. The authors concluded that Kshara Sutra may be a minimally invasive option with promising cure rates.

Table 2: Summary of key clinical studies of Kshara Sutra

Study	Design and population	Comparison	Main findings
ICMR 1991 ^[7]	Multicentric RCT, India	Kshara Sutra vs conventional surgery	Lower recurrence with Kshara Sutra; longer

Study	Design and population	Comparison	Main findings
			treatment
Ho 2001 ^[10]	RCT, Singapore; low fistula (108 randomised)	Ayurvedic cutting seton vs fistulotomy	More early pain with seton; similar healing and continence
Dutta 2015 ^[11]	RCT, Kolkata; 50 patients	Kshara Sutra vs open fistulotomy	Less severe pain, shorter stay, earlier return to work, lower cost; longer healing; recurrence 3.8% vs 12.5%
Hanifa 2024 ^[12]	Meta-analysis of 7 studies	Kshara Sutra outcomes	High cure rate; negligible recurrence and incontinence

PATIENT SELECTION AND PERIOPERATIVE CARE

Selection

Kshara Sutra is best suited to low and simple fistulas, recurrent fistulas after previous surgery, patients at high risk of incontinence (such as women with previous obstetric injury, older adults and those with existing sphincter weakness), and patients who prefer ambulatory treatment. Caution is needed in high trans-sphincteric, suprasphincteric and extrasphincteric fistulas, fistulas associated with Crohn's disease, tuberculosis or malignancy, and in patients with uncontrolled diabetes or immunosuppression, who need medical management and careful assessment before treatment.

Pre-procedure assessment

Before Kshara Sutra, the fistula should be assessed clinically by inspection, digital rectal examination and probing, with proctoscopy to identify the internal opening. For complex or recurrent fistulas, magnetic resonance imaging or endoanal ultrasound helps to define secondary tracts and abscess cavities, which otherwise may be missed and cause recurrence. Investigations for diabetes, tuberculosis and inflammatory bowel disease are indicated where suspected. An abscess should be drained before thread placement.

Post-procedure care

Ayurvedic post-procedure care typically includes warm sitz baths (Avagaha Sweda) with plain water or decoctions such as Panchavalkala two to three times daily; maintenance of soft stools with fibre-rich diet, adequate fluids and mild laxatives such as Triphala; oral formulations such as Triphala

Guggulu or Kaishore Guggulu for their traditional wound-healing and anti-inflammatory actions; and local cleaning with Jatyadi Taila or similar wound-healing oils. Analgesics are given after thread changes as needed. Patients are advised to avoid prolonged sitting, straining and spicy, heavy foods.

These measures are consistent with conventional post-anal surgery care, although the specific contribution of Ayurvedic oral formulations to healing has not been tested in controlled trials.

KSHARA SUTRA IN THE CONTEXT OF MODERN FISTULA MANAGEMENT

Current surgical guidelines recommend fistulotomy for simple low fistulas and sphincter-preserving procedures for complex fistulas, including setons, advancement flaps and LIFT^[4]. Cutting setons are recognised but have been associated with incontinence in some series, depending on technique and tension; a systematic review reported an overall incontinence rate of about 12% after cutting seton treatment, with wide variation between studies^[13]. Kshara Sutra differs from conventional cutting setons in its chemical action and standardised weekly change, which may produce more controlled cutting and healing.

Advantages of Kshara Sutra include simplicity, low cost, ambulatory treatment, minimal hospital stay, early return to work and apparently low incontinence rates. Disadvantages include the need for weekly visits over several weeks, discomfort after each change, longer overall treatment time and variable quality of commercially prepared threads. Its role in high and complex fistulas, including those with multiple tracts, horseshoe extensions and Crohn's disease, is less well established and requires further

study.

Kshara Sutra can also be combined with modern techniques. Examples include partial fistulotomy of the superficial part with Kshara Sutra for the deeper part, and the use of imaging such as fistulography or MRI to define complex tracts before treatment.

SAFETY AND QUALITY

Kshara Sutra is generally safe. Common adverse effects are pain and burning after thread changes, discharge and local irritation. Rare complications include abscess formation, bleeding and, if tension is excessive, sphincter damage. Patient selection and adequate pain management are important.

Quality of the thread is critical. The number of coatings, pH, Kshara content, sterility and tensile strength influence efficacy and safety. Standard operating procedures for preparation and quality testing, including pH measurement and microbial testing, should be followed, and batch documentation maintained.

DISCUSSION

Kshara Sutra is one of the best-studied Ayurvedic surgical procedures. Its classical origin is clear, its modern standardisation is well documented, and randomised trials in India and abroad show outcomes comparable to fistulotomy for low fistulas, with advantages in cost, hospital stay and return to work. Recurrence appears low, though estimates vary with population, fistula complexity and follow-up duration.

The evidence base still has limitations. Trials are relatively few and small, follow-up is often short, outcome definitions vary, and incontinence is not always measured with validated scores such as the Wexner (Cleveland Clinic) incontinence score^[14]. Many studies focus on simple fistulas. Comparisons with newer sphincter-preserving procedures such as LIFT and video-assisted fistula treatment are lacking.

Future research should include: multicentric randomised trials in complex and high fistulas; comparisons with LIFT and advancement flaps; validated outcome measures for continence and quality of life; MRI-based classification of fistulas; long-term follow-up for recurrence; and standardised thread manufacturing with quality certification.

CONCLUSION

Kshara Sutra, described by Sushruta and standardised in modern times, is a minimally invasive, sphincter-preserving and low-cost treatment for fistula-in-ano. Randomised trials show comparable healing and continence to fistulotomy for low fistulas, with advantages in recovery and cost, and recurrence rates that are comparable or lower. It deserves a place among sphincter-preserving options, and larger trials in complex fistulas are needed to define its full role.

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