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**Review Article** 

# THE GLORIOUS HISTORY OF *KSHARASUTRA* – A LITERATURE REVIEW Santosh Kumar Verma<sup>1\*</sup>, Bandana Singh<sup>2</sup>

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2Assistant Professor, Dept.of Rognidan evum Vikriti Vigyan, Jeevan jyoti Ayurvedic Medical College, Aligarh.

**KEYWORDS:** Ksharasutra, Bhagandara, Arsas.

#### ABSTRACT

\*Address for correspondence Dr.Santosh Kumar Verma Asst.Professor Deptt.of Shalyatantra, Jeevan jyoti Ayurvedic Medical College Aligarh U.P Email: <u>santosh007cr@gmail.com</u> Ph no: 9453738755 Ancient Surgical science -*Shalya tantra* embraces all processes aiming at the removal of factors responsible for producing pain or misery to the body or mind. Among all surgical and para surgical procedures, *Ksharasutra* is one of the most important technique in the management of *Bhagandara* (Fistula) and *Arsas* (Hemorrhoids) diseases. Trials were held in renowned medical institutes in various cities of India. The method is fully standardized and is extensively used. In this review an attempt has been made to highlight the whole concepts of *Ksharasutra* in under following headings, Introduction, definition, historical aspects, Ingredients, method of prepation, Mechanism of action of *Ksharasutra*.

#### INTRODUCTION

Ksharasutra the unique Ayurvedic parasurgical intervention using medicated thread now is getting huge popularity all over. Susruta described Ksharasutra in the context of Sinus (Nadi Vrana) of breast. In the contest of Fistula in ano he asked to refer the same therapy from the previous therapy. Apart from it *Ksharasutra* is also effective in conditions which demand gradual excision and overgrown soft tissues like polyps, warts, non healing chronic ulcers and sinuses and papillae. The Brihattrayees doesn't have the exclusive description of Ksharasutra. Later texts Bhavaprakash and Rasatarangini give little information regarding this. However Chakradutta is thought be the main reference for present scholars.

This was later in 1964 demonstrated into an applicable technique by Dr. P. J. Deshpandey, Dr. I. Sanjeeva Rao and Dr. S. N. Pathak at Banaras Hindu University. He is now considered to be the father of present form *Ksharasutra* therapy by many authors. This work has been extended by Central Council for Research in Ayurveda and *Siddha* (CCRAS) and the Indian Council for Medical Research (ICMR) in scientifically validated researches made it popular. Trials were held in renowned medical institutes in various cities of India. The method is fully standardized and is extensively used. As it does not require hospitalization, antibiotics or anesthesia, it has taken a grand popularity. The success rate of *Ksharasutra* treatment has been very high although it is an ambulatory procedure.

## Definition

Dalhana has defined the word *Ksharasutra* as *"Ksharakta sutram"* means the sutra (thread) smeared with the *Kshara*.<sup>[1]</sup> Vagbhata has defined it as *"Kshara pitena sutram"* which means the sutra (thread) which is dipped in *Kshara* and absorbed the *Kshara*.<sup>[2]</sup> In Vaidyaka Sabda sindhu, it is defined as *"Ksara lipta sutram"* means the sutra (thread) coated with *Kshara*.<sup>3</sup> (Vaidyaka Sabda sindhu)

#### Historical aspects

#### Susruta

- First described the *Ksharasutra* in the chapter of *Nadi vrana*. <sup>[4]</sup>
- Ingredients and method of preparation are not described.

#### Charaka

- *Kshharasutra* in the treatment of *Bhagandara* in *Sopha* chapter.<sup>[5]</sup>
- Ingredients and preparation are not described. **Vagbhatta (6 AD)**
- Ksharasutra- Nadivrana and Pariksepi Bhagandara. <sup>[6]</sup>
- Ingredients and method of preparation are not described.

# Chakrapanidatta (11AD) & Bhavaprakasa (16AD)

- First to mention the ingredients (*Haridra Choorna* + *Snuhi Kshira*) of *Ksharasutra*.
- Indicated in Arsas and Bhagandara [7,8]

#### Yoga Ratnakara

Description is similar to Susruta Samhita<sup>[9]</sup>

• Described in the treatment of *Nadivrana*.

# Rasatarangini (1923)

• Described the preparation of *Ksharasutra*<sup>[10]</sup> First to specify number of coatings – 7 Ingredients: Are *Haridra Choorna + Snuhi Kshira* devoid of *Kshara*.

The sequel events which indicate the stage wise development of the *Ksharasutras* (Dr. Sudakar. Rao et al. "A Souvenir on *Ksharasutra*", 2008)

- 1. K.R.Sharma 1968 Standard *Apamarga ksharasutra*
- 2. I.V.P.Rao 1976 Recurrent rate
- 3. Arjun Tripathi 1976 Rectal fistulae
- 4. B.S.Malhotra 1980 Multiple fistulae
- 5. A.K.Singh 1983 Bacteriological study
- 6. Dhanwantari 1984 High anal fistula
- 7. M.K.Jalan 1984 Udumbara Ksharasutra
- 8. O.P.Singh 1986 Papaya Ksharasutra
- 9. A.K.Gupta 1986 Snuhi swarasa Ksharasutra
- 10. Subba Reddy 1990 Extract of *Ghruta kumari*
- 11. Narsing Rao 1990 Snuhi kshira extract
- 12. R.K.Singh 1990 Tankana Kshara
- 13. ICMR 1992 Comparative study of *Ksharasutra*
- 14. Hemanth 1996 Aragwadadi sutra
- 15. Dattatray Rao 1998 Histological Histochemical studies
- 16. Bhaskar Rao 1998 Multi-centre Histo-Pathological Studies

### Ingredients

(Deshpande, P.J and Sharma,K.R, 1977; (S.K.Sharma, K.R.Sharma, Kulwanth Singh, 1995)

Barbour's Surgical Linen No. 20

#### Kshara

Latex of *Snuhi* (*Euphorbia nerifolia*) Powder of *Haridra* (*Curcuma longa*)

### **Other requirements**

- Barber"s Surgical Linen Thread no. 20
- Sterile Bowls
- Sterile Gloves
- Sterile Swabs
- Sterile gauze pieces

- ➤ Hangers
- ➢ Ksharasutra lab

*Ksharasutra* cabinet-fitted with timer, blower and U.V. Light Sealing materials.

Description of each drug

Apamarga<sup>[11]</sup>

Botanical name: *Achyranthus aspera* Linn. Family: Amaranthaceae

**Synonyms:** Apamarga, Shikhari, Adhahshalya, Mayuraka, Markati, Durgraha, Kinihi, Kharamanjari English: The Prickly-Chaff flower, Rough Chaff tree. Hindi: Latjira, Chidchidi, Chircita, Chichada Gujarati: Aghedo

**Distribution:** Throughout India, up to an altitude of 2100 feet; south Andaman Island, commonly found as a weed on way sides and barren land.

### Rasapancaka

Rasa: Katu, Tikta Guna: Laghu, Rukhsha Virya: Usna Vipaka: Katu Part used: Panchanga

# Apamarga Kshara

## Usage

In Sushruta Samhita, Apamarga Kshara along with *Kshara* of some other plants processed with sheep urine is said to be the best to destroy urinary gravel. In Ashtanga Hrudaya, same recipe is mentioned in the treatment of Ashmari. Chakradatta has mentioned that paste of the Kshara of Apamaraa root and Haridra should be applied on *Lingarsa*. Likewise in successive texts; *Apamarga Kshara* is incorporated in many formulations for the treatment of various diseases. It is Ushna, Tikta, Katu, Tikshhna, Dipana, Pachana, Pitta Virechaka, Vamaka, Mutrajanana, Kaphaghna, Krmighana, Vishaghna, Sirovirechak and Amlatanasaka. In indigestion and less GI motility it is used prior to meals. It enhances gastric secretions. After meals it reduces acidity and does Kapha Vilayana. It is very good for liver. It reduces inflammation of bile duct and improves secretions through it. In urogenital disorders it is used with Mulethi, Gokshura and Patha. It is urinary alkaliser and so cures cystitis, urethritis and urinary calculi. In urinary calculi, it should be used with goat urine. It liquefies *Kapha* and so very useful in chronic Kapha Vikara. In Sarpa, Vrischika and Mushika Visha and in dog bite, Panchanga and especially root are applied locally. Apamarga Kshara Taila is used in Badhirya, Karna Shoola and Karna Nada. Bath with its Panchanga cures itching. In fresh wound its *Patra Svarasa* is applied for haemostasis.

#### Method of Preparation of Kshara

The Panchanga of Apamarga plant was used to make *Kshara*. The plant as a whole was burnt to fire in open place. After completion of burning process, it was allowed to cool down. Then the ash of the plant was collected in a clean stainless steel vessel. The ash was then mixed with 6 parts of water, the ratio of ash to water being 1:6. When the ash settled down, the mixture was filtered with a clean cloth. The filtration was repeated for 21 times. The liquid was then evaporated slowly on a moderate constant flame. During evaporation process, the mixture was stirred time to time with a flat stirrer. At the end of the process, the powder was sieved through a fine mesh number 120. After sieving, a uniform fine powder of Kshara was produced It was stored in a clean glass bottle with the air tight cork.

### Snuhi kshira [12]

Latin name: *Euphorbia neriifolia* Linn.

Family: Euphorbiaceae

Synonyms: Snuhi, Sehunda, Sinhatunda, Samanta Dugdha, Vajradruma, Guda, Vajra, Vajari, Snuk, Sudhaa.

English: Milk Hedge.

Hindi: *Thuhar, Sehund, Sij.* Gujarati: Thora

# Rasa panchaka

Rasa: Katu, Tikta Guna: Laghu, Ruksha Virya: Ushna Vipaka: Katu Part used: Kshira (latex)

### Habit and Habitat

It is a large succulent shrub or small tree.

Height: up to 20 ft.

Stem and branches are round shaped and covered with thorns.

Leaves are fleshy, deciduous, ovate-oblong having length of 6-12 inches.

Flowers are yellow.

Seeds are flat and hirsute.

**Habitat:** It is found throughout India; mostly in Bengal, Bihar, Uttar Pradesh, west-northern and southern states. Plants commonly grow in rocky ground. Farmers cultivate it to make the boundaries of farm.

## **Chemical Constituents of Latex**

1. Total solid: 29.57%w/w

2. Water soluble substance: 08.14%w/w

- 3. Dry rubber content: 21.43%w/w
- 4. Resin content: 13.81%w/w
- 5. Ash value: 1.17%w/w
- 6. Acid insoluble ash: Trace

**Usage:** *Kshira* is strong purgative. It may cause vomiting and watery diarrhoea. In *Udara Roga* it is used with *Maricha*. Roots are used with *Maricha* in post natal fever and snake poison. *Kshira* produces blisters on skin. It is used for warts and for preparation of *Kshara Sutra* for the treatment of *Arsha, Nadi Vrana, Bhagandara, Arbuda,* etc. In *Tamaka Swasa, Patra Svarasa* is given with honey.

Time of collection: Month of October to April.

# Method of collection

In the early morning, before sun rise, after putting on gloves and doing *Mangalacharana*, a deep incision is made on the stem of a fresh *Snuhi* plant. The stream of *Kshira* was coming out through the incision which was collected in a bowl. After enough collection, the *Kshira* was kept in a freeze to maintain a low temperature and preserve for long time.

# Haridra<sup>[13]</sup>

Botanical Name: Curcuma longa Linn.

Family: Zingiberaceae

Synonyms: Haridra, Kanchani, Pitta, Varavarnini, Kṛmighni, Haladi, Yoshitpriya, Hatta vilasini, Rajani, Gauri, Nisha,etc.

**English:** Turmeric

Hindi: Haldi

Gujarati: Haladara

# Rasa Pancaka

Rasa: Tikta, Katu, Guna: Ruksha, Laghu Virya : Ushna Vipaka : Katu Part used: Kanda

# Habit and Habitat

It is a herb and Leaves are large. Flowers are half inch in length. Seeds are round and knotted with large root stalks, cylindrical tubers, which are orange coloured from inside.

### **Chemical constituents**

Volatile oil: 5-6%

Starch: 24%

Albuminoids: 30%

It contains curcumin and curcumen (A type of turpen).

**Habitat:** It is cultivated all over India and south Asian countries. In India, it is used in So many recipes in kitchen routinely.

#### Usage

 $\geq$ It is Ushna, Uttejaka, Sugandhit, Rakta Sodhaka, Twaka Doshahara, Sothahara, Dipana, Grahi, Vatahara, Vishaghna and useful in Vrana. It is used in various diseases like Pratisvava. Kapha Vikara, Carma Roga, Rakta Vikara, Prameha, Kamala, Yakrita Vikara, Ivara, Atisara, Grahani, Vrana and Abhishvanada. In Pratisvava, Prameha, Pradara and Kasa, it is given with cow Duadha and Guda. It is evaporated and the vapours are inhaled in *Pratisyaya*. Vapours are also inhaled in Sarpa and Vriscika Visha and Bhuto Unmada. In inflammatory condition, it is applied locally. In Prameha, it is used with Amalaki. In Pradara, it is used with Guggulu. Haridra Choorna with Gomutra is used internally in skin diseases. In Abhishvanda, 1 part of Haridra Choorna is dissolved in 20 parts of water and frequently applied over eyes. In Shlipada, it is used with cow Mutra and Guda.

# Classical method of preparation of Ksharasutra स्धाद्ग्धे वस्त्रप्ते हरिद्राचूर्ण संय्ते।

निषिक्तेन तु तूलेन स्वल्पेन खुल यत्नतः।।

प्रलिप्त सुद्रढं सूत्रं छायायामथ शोशयेत्।

विलिप्य सप्तधा हयेवं शोशयेत् भिषजां वरः।।

सूत्रमेतत् समाख्यातं क्षारसूत्रं तु नामतः<sup>॥ [14]</sup> (Rastaranginii tarang-24/527,528,529,530)

भावितं रजनीचूर्णैस्नूहीक्षीरै : पुन :पुन:। बन्धनात् सुदृढसूत्रो भिनत्यर्शौ भगन्दरं।| (Cakra-Dutta Arsachikitsa – 5 / 148 (page no. 91)<sup>[15]</sup>

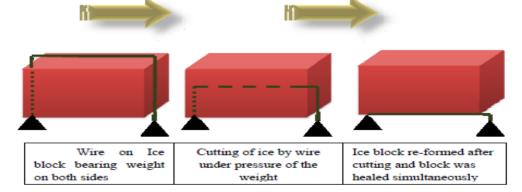
# Method described in Ayurvedic pharmcopoeia of India [16]

Spread the surgical linen thread of size 20 throughout the length and breadth of the hangers of known specially designed cabinet the as Ksharasutra Cabinet. Smear the thread with latex. uniformly and carefully, all around the thread, with the help of clean gauze piece soaked in the Snuhi Kshira. After smearing all the threads on the hanger, place the hanger in the *Ksharasutra* cabinet for drying. Close the cabinet properly and dry at 50 degree Celsius leaving it overnight. Close all the outlets of the *Ksharasutra* cabinet properly in order to prevent the entry of moisture in to the cabinet. After eleven such coatings with Snuhi Kshira, process next day for the 12th coat of Snuhi Kshira and then pass the wet thread through a heap of finelv powdered Kshara immediately. After smearing all the threads with *Kshara*, shake the hanger gently allowing the excess particles of Kshara to fall down. Place the hanger in the *Ksharasutra* Cabinet and dry. Repeat this process till seven coatings of Snuhi Kshira and Kshara are achieved, thus completing 18 coatings on the thread. Perform the remaining 3 coatings with Snuhi Kshira and fine powder of Haridra as per the above said procedure making a total 21 coatings on the thread. Put on the ultraviolet lamp of the Ksharasutra cabinet daily for 20-30 minutes to maintain sterile atmosphere right from the 1st day of coating. Cut the threads of a uniform length i.e. 30-32 cm for packing as directed.

Stage	Material	P.J Deshpande	S.N Pathak
1.	Snuhi Kshira	10	11
2.	Snuhi Kshira + kshara	07	07
3.	Snuhi Kshira+ Haridra Choorna	04	03
4.	Total	21	21

#### **Table 1: Coatings**

#### Mechanism of action of Ksharasutra



- *Ksharasutra* destructs the wall of the fibrotic track by *Ksharana* i.e., disintegration of unhealthy tissue- the principle behind prevention of recurrence.
- This debridement encourages healing by promoting healthy granulation tissue to ensure perfect healing by secondary intension.
- It is a slow process of cutting of the tissue (Fistulous track) and hence the tissue gets sufficient time to heal properly and develops collaterals to form healthy scar by epithelial tissue which checked permanent damage to the anal sphincters and thus prevents incontinence, especially in high level cases of anal fistula. Thus, in this way the integrity of Levator Ani and Sphincteric apparatus is preserved.
- This procedure allows the invisible minor tracts to drain into the major track and get sufficient time to heal themselves completely before the major track is cut-through with *Ksharasutra*. A novel drug delivery system to the fistulous track with 21 coatings of the drug on *Ksharasutra* which gets dissolved one by one gradually to maintain the constant effect of the drug in situ.

Thus the Mode of action of the *Ksharasutra* can be explained in the following way by Theory of simple mechanical pressure: *Ksharasutra* exerts mechanical pressure on the local tissue since it is tightly applied around the fistulous track by fixed knots just like seton, hence it cuts the tissues. Then natural healing takes place.

**Theory of Chemical cauterization:** The local tissue necrosis occurs and lying down of new tissue by proliferation of connective tissue takes place.

**Theory of Antibiotic effect:** The ingredients of *Ksharasutra* are having antibiotic effect, so it helps in the healing of the fistula.

**Theory of Local drug delivery system:** The drugs in the form of *Kshara* are delivered in the local pathological tissue planes, so that they act on the deeper planes and depend upon the local environment. The *Kshara* and other material exert effect on the tissue so that the chemical reactions take place which enhance the chance of degeneration of unwanted tissue lining the track.

#### Effect of Ksharasutra

It causes irritation and inflammation in the track. Then necrosis takes place and shedding of the bad granulation tissue takes place. Fibroblastic proliferation occurs which contain spindle shaped fibroblasts with tapered ends which form a fibrin network. Thus it helps in complete healing. Uses

In *Bhagandhara* (fistula-in-ano), *Nadivrana* (Sinus), *Arbuda* (tumours), *Arshas* (haemorrhoids), *parikartika* (Fissure-in-ano), rectal polyp, *Twagarsa* (Warts).

#### Advantages

It is a Simple, Safe, Sure & reliable therapy. It requires minimal investigations, does not require Anesthesia. heavy medication and General prolonged hospitalization. So it is affordable & cost effective therapy. It will not cause much inconvenience to the patient. So Patient can do normal routine activities during treatment period. There will be no post operative complications like faecal incontinence; bleeding and no side effects like delayed healing. It causes relatively lesser Pain and damage to the tissues. after treatment very narrow and fine scar is formed. The recurrence rate is very low. Now days it is widely practiced in India and abroad and is also recognized by WHO.

#### Disadvantages

The length of the treatment depends on the extent of affected area in Anal Fistula

**Different varieties of** *Ksharasutra* (Martha Bhaskar Rao, Lavekar .G.S, 2009) <sup>[17],</sup>

- Apamarga Ksharasutra
- Udumbara Ksharasutra
- Papaya Ksharasutra
- Snuhi swarasa Ksharasutra Yava Ksharasutra
- Ghrutakumari Ksharasutra
  - Snuhi kshira Ksharasutra
  - Gomutra Ksharasutra
  - *Guggulu Ksharasutra Arka kshira* based *Ksharasutra*
  - Madhu coated Ksharasutra
  - Gandhaphiroja Ksharasutra
  - Tankana Ksharasutra
  - Aragvadhadi Ksharasutra
  - Madhu Madhuyashthi coated Ksharasutra
  - Tilakalka based Ksharasutra
  - Vasa Ksharasutra
  - Ropana dravya coated Ksharasutra Etc.

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