

AYURVEDIC PRESPECTIVE OF KSHAR: A LITERARY REVIEW

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ABSTRACT

Kshar is a substance, which is alkaline in nature. It extract of medicinal plants ashes which is used in various disorders. Kshar chikitsa is a paramedical treatment in Ayurveda. The etymological significans of the term kshar is based on their property of corroding (the skin or the flesh of an affected part of the body), or on their peculiar quality in destroying the skin and flesh where such an effect is desired. Since a variety of substances enter into the composition of kshar, they are endued with the virtue of subduing the three deranged bodily humours. Owing to their white colour, kshar should be included within the category of cooling substances (Saumya).

KEYWORDS: AYUSH, Kshar, Shalya.**INTRODUCTION**

The Kshar is a chemical substance obtained from methodological process of plants ash. Ancient Indian surgeon Susruta, the writer of Susruta Samhita described supremacy of the kshar than any of the surgical and para-surgical technique.^[1] Kshar (caustic alkali) is the most important one among shastra (sharp instruments) and anushastra (accessory instruments), but it does functions like excision (removal), cutting (diving), and scraping, mitigates all the three dosas and is suitable for being used by special methods.^[2]

The word kshar is derived from two words ksara and ksana, ksara means to dislodge or to destroy. The term ksharnand implies to debridement and liquification of vitiated tissues in the infected wound. The term kshanan implies to excision by destruction of tissue.^[3]

Types of Kshar^[4]

It is of two kinds, Pratisarniya (to be applied externally) and Paniya to be drunk internally (internal potion).

1. Pratisaraniya Kshar^[5] It is used for local application to treat the various surgical and para surgical diseases like kushta (leprosy), kitibha, dadrumandala (these are skin disease), leucoderma, fistula in ano, malignant tumors, haemorrhoids, vitiated (septic) ulcers, sinus ulcers, skin warts, pin heads, pigmented patches on the body and on the face, moles on the skin, external abscess, worms (bacteria etc.) disease produced by poisons, the seven diseases of mouth such as upjihva, adhijihva, upakusa and danta vaidarbha: three kinds of rohini (kantha rohini of vata, pitta and kapha origin).

2. Paneeya Kshar^[6] It is a liquid solution of Kshar administered orally to treat the different diseases like abdominal tumor, enlargement of the abdomen, disorder due to irregularities of digestive power, indigestion, loss of taste, distention of the abdomen, urinary gravel and calculus, internal abscess, worms, poisons and haemorrhoids

According to potency of Kshar, it has been divided into three types^[7]

1. Mridu Kshar: Lower potency kshar, where the pathological tissues do not turn to black up to normal counting of 100 numbers.
2. Madhyam Kshar: It is kshar of medium potency where the unhealthy tissue after its application turns to black up to normal counting of 100 numbers.
3. Tikshna Kshar: It is very high potency kshar where affected part of body tissues turns to black before completing the counting of 100 numbers.

Preparation of Kshar^[8]

The person desirous of preparing the kshara act as follows- After becoming clean, having fasted, during sharad ritu (autumn season), search a kaal muskah tree, grown in auspicious place devoid of breeze; some quantity of Sudha Sharkara (lime stone) are also put into this heap and set on fire with the help of reeds of dried tail plant. After the fire has become extinct, the ashes of both the tree and lime stones are collected separately.

One drone (10.24 kg) of ash is put into six drone (61.44 kg) of water or cows urine, stirred well, filtered through cloth twenty one times, put into a large (iron) cauldron

and cooked (boiled) stirring with a ladle slowly and constantly; when the liquid becomes clear, red in colour, sharp and slimy, it is filtered through a thick cloth into another vessel (of iron) and cooked again. From the solution of the ash one or one and a half kudava (160 or 240 gms) of it is removed. This is meant to prepare the paste (mentioned further). After that the ash of Katashakra, Bhasma Shakara (Ash of Lime Stone), Kshira Paka Clay And Shankha Nabhi are made red hot and put into iron vessel containing the solution of ash and stirred well; the eight pala (320 gms) ash of shankh nabhi etc. (katashakara, bhasmashakara (sudhasma) kshirapaka and shankha) are macerated into two drone (20.84 kg) of the same solution (taken out earlier), made as a paste is also added as (a prativapa), cooking is continued, stirring all through till the mass become neither very solid nor very liquid (thin); afterwards it is taken out of the oven, poured into iron vessel having a lid and preserved carefully.

This is method of preparing Madhyama kshar. This Kshar itself if prepared without prativapa (adding paste of other drugs) is called as samvyuhima kshara or Mridu kshara.

Danti, Dravanti, Chitraka, Langali, Putika, Pravala, Talapatri, Bida, Suvarchika, Kanakaksiri, Hingu, Vaca And Ativisha, each in quantity of one sukta are made into fine powder and added; this is Prativapa (addition of extra drugs to enhance the properties). When kshara (alkali) is prepared with it is called Pakya kshara or tikshna ksara (of strong potency).

Other plants indicated for kshar preparation^[8]

- 1) Kutaja - *Holarrhena antidysenterica*
- 2) Palasa - *Butea monosperma*
- 3) Sala - *Shorea robusta*
- 4) Nimba - *Azadirachta indica*
- 5) Vibhitaki - *Terminalia bellirica*
- 6) Putikaranja - *Caesalpinia bonducella*
- 7) Karavira - *Nerium indicum*
- 8) Karkataka - *Pistacia in tergerima*
- 9) Aragwadha - *Cassia fistula*
- 10) Lodhra - *Symplocos racemosa*
- 11) Arka - *Calotropis gigantea*
- 12) Snuhi - *Euphorbia nerifolia*
- 13) Apamarga - *Acyranthes aspera*
- 14) Arjuna - *Terminalia arjuna*
- 15) Agnimandha - *Clerodendrum phiomidis*
- 16) Patola - *Stereospermum suaveolens*
- 17) Karanja - *Derris indica*
- 18) Vasa - *Adhatoda vasica*
- 19) Kadali - *Musa paradisiaca*
- 20) Citraka - *Plumbago zeylanica*

Properties of Kshar

Normally kshar is white in colour, brownish colour is due to impurities left during process of filtration. The taste is bitter. It is highly hygroscopic and contains the salts of sodium, potassium and magnesium etc. It is

highly alkaline with pH 10.5, which is measured by pH scale paper.

Kshar Guna^[9]

1. Nati tiksna - not too corrosive
2. Nati mrdu - not too hard
3. Nati slaksna - not too smooth
4. Nati pichila - not too sticky
5. Nati cencala - not too slippery
6. Sikari - effervescent
7. Na visyandi - not too hygroscopic
8. Sukha nirvapy - easy neutralization
9. Nati ruk - not too painful

Kshar Dosas^[10]

1. Ati mrdutva - extreme softness
2. Ati swadatva - extreme white in colour
3. Ati usnata - too hot to touch
4. Ati tiksnata - highly reactive
5. Ati pichilatva - too sticky
6. Ati saralata - too lighter
7. Ati sandratva - too heavy
8. Ati anatva - kshars prepared with less potent drug
9. Ati sitala - too cold to touch
10. Ati tanutva - less specific gravity

As per Susruta, Kshars also possess the following qualities

1. Tridosaghna – Because of different types of drugs can pacify all the humours.
2. Saumyata – Owing to their white colour.
3. Dahana – Owing to its burning nature.
4. Pacana – Because of its digestive capability.
5. Dharana – Since many drugs of Agneya nature enter into their composition.
6. Katuka – Because of its pungent taste.
7. Usna – Because of its heat producing nature.
8. Tikсна – Because of irritant nature.
9. Vilayana – Because of its liquefaction property.
10. Sodhana – Because of its cleaner property.
11. Ropana – Improves granulation.
12. Sosana – Absorption.
13. Stambhana – Arresting or stopping nature.
14. Lekhana – Scraping property.
15. Krimighna – Because of its antimicrobial action.

Kshar Ayogas - Contra Indications^[11]

1. Rakta pitta - Haemorrhagic disorders
2. Jwara - Hyper pyrexia
3. Pitta prakrti - Hyper sensitive temperament
4. Brama - Vertigo
5. Mada - Intoxication
6. Murca - Shock
7. Timira - Early cataract

Mechanism of Kshar Action

When Kshar applied on the skin for a specific therapeutic intention, it does irritation on the dhatus with its high inflammatory nature resulting in chemical coagulation pacifying provocation dosas.

REFERENCES

सुश्रुतसंहितायां सूत्रस्थाने क्षारपाकविधिर्नामैकादशोऽध्यायः

1. शस्त्रानुशस्त्रेभ्यः क्षारः प्रधानतमः, छेदयभेद्यलेख्यकरणात् त्रिदोषघ्नत्वाद् विशेषक्रियावचारणाच्च ॥३॥
2. नानौषधिसमवायात्त्रिदोषघ्नः शुक्लत्वात् सौम्यः, तस्य सौम्यस्यापि सतो दहनपचनदारणादिशक्तिरविरुद्धा, आग्नेयौषधिगुणभूयिष्ठत्वात् कटुक उष्णस्तीक्ष्णः पाचनो विलयनः शोधनो रोपणः शोषणः स्तम्भनो लेखनः कृम्यामकफकुष्ठविषमेदसामुपहन्ता पुंस्त्वस्य चातिसेवितः ॥५॥
3. तत्र क्षरणात् क्षणनाद्वा क्षारः ॥४॥
4. स द्विविधः- प्रतिसारणीयः, पानीयश्च ॥६॥
5. तत्र प्रतिसारणीयः कुष्ठकिटिभेदद्रुमण्डलकिलासभगन्दरार्बुदाशोदुष्टव्रणनाडीचर्मकील- तिलकालकन्यच्छयङ्गमशकबाहयविद्रुमिषादिषूपदिश्यते, सप्तसु च मुखरोगेषूपजिहवाधिजिहवोपकुशदन्तवैदर्भेषु तिसृषु च रोहिणीषु, एतेष्वेवानुशस्त्रप्रणिधानमुक्तम् ॥७॥
6. पानीयस्तु गरगुल्मोदराग्निस्त्रिदोषघ्नोऽङ्गाजीर्णारोचकानाह-शर्कराशर्म्याभ्यन्तरविद्रुमिषादिषुःसूपयुज्यते ॥८॥
7. अथेतरस्त्रिविधो मृदुर्मध्यस्तीक्ष्णश्च ॥११॥
8. तं चिकीर्षुः शरदि गिरिसानुजं शुचिरुपोष्य प्रशस्तेऽहनि प्रशस्तदेशजातमनुपहतं मध्यमवयसं महान्तमसितमुष्ककमधिवास्यापरेद्युः पाटयित्वा खण्डशः प्रकल्प्यावपाट्य निवाते देशे निचितिं कृत्वा सुधाशर्कराश्च प्रक्षिप्य तिलनालैरादीपयेत् ।अथोपशान्तेऽग्नौ तद्गन्धमपृथग्गृहणीयाद्गन्धशर्कराश्च ।अथानेनैव विधानेन कुटजपलाशाश्वकर्णपारिभद्रकबिभीतकारग्वधतिल्वकार्कस्नुह्यपामार्गपाटलानक्तमालवृषकदली- चित्रकपूतीकेन्द्रवृक्षास्फोताश्वमारकसप्तच्छदाग्निमन्थगुञ्जाश्चतस्रश्च कोशातकीः समूलफलपत्रशाखा दहेत् ।ततः क्षारद्रोणमुदकद्रोणैः षड्भिरालोड्य मूत्रैर्वीयथोक्तैरेकविंशतिकृत्वः परिस्त्राय, महति कटाहे शनैर्दर्व्याऽवघट्टयन् विपचेत् ।स यदा भवत्यच्छो रक्तस्तीक्ष्णः पिच्छलश्च तमादाय महति वस्त्रे परिस्त्राव्येतरं विभज्य पुनरगनावधिश्रयेत् ।तत एव क्षारोदकात् कुडवमध्यर्धं वाऽपनयेत् ।ततः कटशर्कराभस्मशर्कराक्षीरपाकशङ्खनाभीरग्निवर्णाः कृत्वाऽऽयसे पात्रे तस्मिन्नेव क्षारोदके निषिच्य पिष्ट्वा तेनैव

- द्विद्रोणेऽष्टपलसम्मितं शङ्खनाभ्यादीनां प्रमाणं प्रतिवाप्य, सततमप्रमत्तश्चैनमवघट्टयन् विपचेत् । स यथा नातिसान्द्रो नातिद्रवश्च भवति तथा प्रयतेत ।अथैनमागतपाकमवतार्यानुगुप्तमायसे कुम्भे संवृतमुखे निदध्यादेष मध्यमः ॥११॥ एष चैवाप्रतीवापःपक्वः संव्यूहिमो मृदुः ॥१२॥ प्रतीवापे यथालाभं दन्तीद्रवन्तीचित्रकलाङ्गलीपूतिकप्रवालतालपत्रीविडसुवर्चिका कनकक्षीरीहिङ्गुवचातिविषाः समाः श्लक्ष्णचूर्णाः शुक्तिप्रमाणाः प्रतीवापः ।स एव सप्रतीवापः पक्वः पाक्यस्तीक्ष्णः ॥१३॥
9. नैवातितीक्ष्णो न मृदुः शुक्लः श्लक्ष्णोऽथ पिच्छलः । अविष्यन्दी शिवः शीघ्रः क्षारो ह्यष्टगुणः स्मृतः ॥१६॥
10. अतिमार्दवश्चैत्यौष्ण्यतैक्ष्ण्यपैच्छिल्यसर्पिताः । सान्द्रताऽपक्वता हीनद्रव्यता दोष उच्यते ॥१७॥
11. अहितस्तु रक्तपित्तज्वरितपित्तप्रकृतिबालवृद्धदुर्बलभ्रम-मदमूर्च्छातिमिरपरीतेभ्योऽन्येभ्यश्चैवंविधेभ्यः ॥१९॥

Kshar Sutra Introduction

Kshar sutra is well known medical surgical ligature used to manage the various surgical disorders. kshar sutra karma is a minimal invasive parasurgical measure used to chedan, lekhan, shodhan and ropana karma. In fistula in ano chedan karma of kshar sutra is because of its mechanical pressure and phytochemical cauterization.

Historical Background

Brihatrayee well documented the application of ksharsutra in different surgical disorders. Ancient Indian surgeon Susruta described the word Kshar Sutra and its application into nadvran(Sinuses), bhagandara(Fistulae), arbuda(Tumours). Acarya Charak also described ksharsutra in bhgandara. Acharya Vagabhatta also followed Sushruta's concept of kshar sutra application. But there is no description regarding the process of preparation of ksharsutra. In laghutrayee, only Bhavprakash has mentioned the use and method of application of ksharsutra similar to that of sushruta.

Later Raskamdheni described the use of ksharasutra in different surgical disorders. But other Ras-aushdah chikitsa text has been described various type of sootra, medicated with different drugs eg. Snuhi, haridra etc. Those texts never used kshar as an ingredient of ksharsutra preparation. According to Dalhan – he mentioned the Kshar Peetain Sutrain, which means the thread concentrated with liquid kshar after dipping in it for some times. According to Chakrapani Datta - he described the technique of manufacturing the thread by smearing it with the latex of Snuhi (*Euphorbia nerifolia*) and powder of Haldi (*Curcuma longa*) repeatedly.

Historical perspective of kshar sutra is as follow as

1. **Charaka** has described in the chapter of Sotha Cikitsa that Kshar sutra should be used with other measures in the management of Bhagandara (Ca.Ci. 12th /97).
2. **Susruta** mentioned its reference in Nadivrana Cikitsa.
3. **Astanga Hridaya** had clearly mentioned along with Sastrakarma, Agnikarma and Ksarakarma.
4. **Cakradatta** in his Arsodikara clearly mentioned the idea of preparation of Kshar sutra, but the usage of Kshar in the preparation of Kshar sutra has not been mentioned.
5. **Sadananda Sharma** in his book Rasatarangini has thrown more light on the preparation of Kshar sutra, but not clearly mentioned the usage of Kshar. He emphasized that 7 coatings of Haridra powder should be done on thread, layered by Snuhi Ksheera. He was very specific for its usage in the Gudankura (Anal condylomas) and Bhagandara (Fistula -in -ano).

In modern era on the basis of above references after various experimentation and modification the kshar sutra was prepared and standardized in the various institute of Ayurveda science.

It was the idea of Dr Sankaran to explore the possibility to prepare kshar sutra and to use it in fistula in ano. After his noble initiation late Prof. P.J. deshpandey started work at different angles with scientific approach.

Further, the work was carried out in various institute of Ayurveda science all over india and even in foreign countries like japan.

Preparation of Ksharsutra

Material

1. Kshar sutra hanger
2. Kshar sutra cabinet
3. Thread
4. Snuhi ksheer
5. Haridra Powder
6. Apamarg kshar

1. Kshar Sutra Hangers (FIGURE 1)

Rectangular frame made by Wood or thick Aluminium strips measuring 15*20 inch is used. The frame has hook on mid upper surface of horizontal arm. 8 to 10 such frames are required. Their number can be increase according to the requirement of the kshar sutra. Each hanger has small cut s on the both sides which are placed at a distance of 2-3 cm from each other. One hanger can accommodate apporox 30 linen thread at a time.

2. Kshar Sutra Cabinet (FIGURE 2)

Wooden or steel made cabinet of required size is used for preserving the kshar sutra hangers during process of manufacturing. A standard ksharsutra cabinet can accommodate as many as 30 – 50 hangers. The kshar

sutra frames are hooked into the rings in the aluminium rod after smearing it with drugs. Thermostatic ksharsutra cabinet with u.v. light is popular today`s era

3. Thread (FIGURE 3/3)

The surgical thread linen Barbour`s No. 20 is standard and very useful for kshar sutra preparation. But a strong cotton thread can be use on account of linen thread. It is easily available in the market and its tensile strength is quite enough.

The ideal thread should have these properties

1. It should be good in tensile strength
2. It should be acceptable, should not cause contact reaction
3. It should have the capacity of retaining the coating of the application of medications
4. It should have sufficient thickness

4. Snuhi ksheer (FIGURE 3/4)

It is latex of *Euphorbia nerifolia*, It is a plant found abundantly all over the country. Its synonym are Snuhi in Sanskrit and Sehund in Hindi.The milky latex oozes from stem and leaves of the plant even with slight erosion on it. The latex coagulates rapidly within 1-2 hours after exudation from stem and collection. Latex is sticky and milky in colour.

Collection of latex

The Kshar sutra is prepared in every season except rainy season, extreme summer season and cloudy weather, .ideal months are September to November and February to May. the pointed knife is used to make a small incision in the stem of Euphorbia. The latex is rapidly collected into the small pot. multiple incisions are made on the stem and the desired quantity of fresh latex is thus collected. Then it is smeared immediately on the thread otherwise it will coagulate after 1-2 hours. Storage of latex for long use is problem because of coagulation. Mixing with kshar the latex may be preserved for 2-3 days.

5. Haridra Powder (FIGURE 3/1)

The scientific name is *Curcuma longa*. It is available in the market. after washing in the water and drying, it should grinding into very fine powder and is filtered with fine clothes. The kshar sutra prepared from market powder of curcuma longa causes severe irritation to the patient when used in practice. Because there are many impurities of spices and other irritating materials in the powder available in the market.

6. Apamarg kshar (FIGURE 3/2)

It is a product prepared by burning the plant, achyranthes aspera and mixing the ash in water and keeping it overnight. After filtration the water is heated to get a fine white coloured powder. Acharya sushruta had told many plants from which kshar can be prepared.

Technique of Preparation of Kshar Sutra

20 no. surgical linen threads are spread horizontally throughout the length of the hanger. Then it is mounted over a hanger stand. Each thread is smeared with latex of snuhi with help of a sterile gauze piece. The threads are smeared uniformly on every side. The hangers are now placed in cabinet one by one. The cabinet is closed properly and hot air is blown inside for uniform drying of threads. In this way 11 coating of snuhi kshira are done. Further 7 coatings of snuhi kshira with apamarg kshara are applied. The thread is smeared in snuhi kshira then it is dipped in fine powder of apamarg kshar. The hanger is topped slowly and gently to remove the excess kshar from the thread. After that further three coating are applied with latex of snuhi and fine powder of haridra. Thus total 21 coatings are applied over the threads.

The order of coatings is as follows

- | | |
|----------------------------------|---------------|
| 1. Snuhi Ksheer | - 11 Coatings |
| 2. Snuhi Ksheer + Apamarga Kshar | - 7 coatings |
| 3. Snuhi Ksheer + Haldi powder | - 3 coatings |
| Total - | 21 coatings |

Packing of Kshar Sutra

Thus prepared kshar sutras are dried well and cut into the pieces from side arms of hangers. Then Kshar sutras are spreaded into the cabinet and exposed to ultraviolet radiation for 2-3 hours. After that threads are folded from the centre and packed into the glass tube. Date of manufacture, batch no, and ph should be labelled on each unit of prepared kshar sutra.

Precautions

1. Kshar coating is done during minimal humidity atmosphere.
2. Kshar is highly hygroscopic so coating is avoided during cloudy weather with heavy humidity.
3. During packing threads should be absolutely dry.
4. Sealing of test tube should be complete. Any unsealed minute aperture will allow the entrance of humidity, which will destroy the kshar sutra. The sutra will break down easily even with application of slight tension and becomes useless.

Application of Kshar Sutra in Surgical Disorders

Kshar sutra can be successfully used in following disorders

1. Fistula in ano
2. Piles
3. Fissure In Ano with sentinel tag
4. Pilonidal Sinus
5. Abscess and infected wound
6. Benign growths

The technique of application and complications of Ksharsutra therapy in fistula in ano will be discussed in the forthcoming chapter.

Mechanism of Action of Kshar Sutra

Mechanism of action of Kshar sutra as follow as

1. Mechanical pressure over the tissue causes destruction of the tissue followed by excision
2. Letex of snuhi is proteolytic, so it dissolve the tissue
3. Kshar has shodhan, ropana and lekhana properties
4. Haridra powder is antiseptic and potent wound healer agent

Advantage of Kshar Sutra Therapy

1. Simple, safe and sure treatment
2. It is minimal invasive therapy
3. No hospitalization required in most of the cases
4. It is cost effective therapy
5. Less scar formation after wound healing
6. Recurrence rate are almost 1 %