Clinical Implications of Kshar and Kshar Karma in Various Surgical Conditions

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ABSTRACT
Kshar is a special ayurvedic herbal preparation for external as well as internal medicinal purposes. It is highly useful drug in terms of surgical interventions. Kshar sutra is a well known application in number of ano-rectal conditions. Researches have explored its significance in chronic problems like fistula-in-ano etc. Kshar is corrosive in nature despite its saumya guna. It debrides unhealthy tissues in a very gentle manner. Methodology: In Vrihadtrayi as well as in laghutrayi, kshar has been exclusively depicted. Search was made in different texts of ayurveda. Major issues and challenges: Kshar karma is the external application of kshar, which should be done under the supervision of experts. Otherwise, it may cause various complications. Kshar has different potencies on which the desired action takes place. When kshar is applied locally in diseased condition, it may harm the healthy tissues also. So, proper care must be taken while it is used.

Conclusion: Kshar has gained its popular role in ano-rectal diseases. However, in ayurveda, its scope is not limited to a particular field. Kshar karma has been described in so many conditions, which are still considered as incurable or recurrent in present time.

KEYWORDS
Kshar Karma, Pratisarniya Kshar, Chronic Surgical Conditions
INTRODUCTION

*Kshar* are alkaline substances obtained from the water soluble ash of the drugs of plant origin\(^1\). The *kshar* belongs to *agnibhuta* since the properties of *kshar* are burning and destructive, that simply means the material is caustic. *Kshar* is the most important one among sharp instruments and accessory instruments, because it does functions like excision, dividing and scraping, mitigates all the three doshas and suitable for being used by special methods\(^2\). The substance is called *kshar*, because it causes *ksharan* (destruction) to the *aashaya* and expels the doshas through the inferior route\(^3\). It is called kshar, since it destroys (the vitiated tissues and make them fall off) or since it torments the tissues\(^4\). According to *Dalhanachrya*, *kshar* causes destruction of the putrefying and devitalized tissues of the body and vitiated *doshas* and make the skin or tissues of the body to shed off\(^5\). *Acharya Charak* has mentioned the term “*Kshar_tantara_vid*” to the experts performing *kshar karma* exclusively. This clearly indicates *Kshar karma* was a very specialized technique and was highly popular at that time\(^6\). *Kshar* administered unwisely will be like the effect of poison, fire, sharp weapon, thunderbolt and death; the same used properly by an intelligent physician, cures even dreadful diseases quickly\(^7\).

AIM AND OBJECTIVES

- To discuss different aspects of *kshar*.
- To emphasis the role of *kshar karma* in different surgical conditions.
- To rationalize the vision of *Acharya Sushruta*.

MATERIAL AND METHODS

All the references were collected from the various ancient ayurvedic literatures, research journals and websites related to the topic.

Types of *kshar*\(^8\):

1. *Paniya* (For internal use)
2. *Pratisaraniya* (For external application)

*Pratisaraniya kshar* is again divided into three types:

a) *Mridu* (Mild potency)
b) *Madhya* (Medium potency)
c) *Tikshna* (Powerful)

Medicinal plants useful for *kshar* preparation\(^9\):

1. *Kutaj*
2. *Palasha*

13. *Vrikshaka*
14. *Kadli*
3. Ashwakarna
4. Paribhadra
5. Vibhitaki
6. Aragwadh
7. Bilwa
8. Arka
9. Snuhi
10. Apamarg
11. Patla
12. Naktmala

Kshar preparation\textsuperscript{10}:
On an auspicious day during sharad ritu (autumn season) a middle aged and big sized kala musakaka tree (or any of the plant described above, their root, stem, branches, leaves and fruits may be taken) is selected, some quantity of sudha sharkara (lime stone) are also put into this heap and set on fire with the help of reeds of dried tila plant. Next one drone (10.24 kg) of ash is put into six drona (61.44 kg) of water or cow’s urine, stirred well, filtered through cloth twenty one times, put into a large cauldron and boiled constantly; when the liquid becomes clear, red in colour, sharp and slimy, it is filtered through a thick cloth into another vessel and boiled again.
After that the ash of katasarkara, ash of limestone, oyster shell and conch shell are made red hot and put into the vessel containing the solution of ash and boiling is continued, stirring all through till the mass becomes neither very solid nor very liquid; afterwards it is taken out of the fire, poured into a vessel having lid and preserved carefully.
This is the method of preparing madhyam kshar. This kshar itself if prepared without prativapa (adding paste of other drugs) is called as samvyuhim or mridu kshar.

Danti, dravanti, chitraka, langali, putika, hingu, vacha, ativisha, talapatri, praval, bida and kanakasiri all or as many as available, each equal in quantity of one sukti (20 grams) are made into fine powder and added; this is prativapa. When kshar is prepared with prativapa it is called pakwa or tikshana kshar.

Different views of Kshar preparation\textsuperscript{11}:
To avoid any reaction to the metal, use of earthen pot in indicated in *Sharangdhara samhita*. 

**Table 1** Views of different authors

<table>
<thead>
<tr>
<th>Water ratio</th>
<th>Soakage time</th>
<th>Staining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharangdhar</td>
<td>4:1</td>
<td>1 Night</td>
</tr>
<tr>
<td>Ras tarangini</td>
<td>4:1</td>
<td>Iyaam (3hrs)</td>
</tr>
<tr>
<td>Yadav ji</td>
<td>6:1</td>
<td>1 Night</td>
</tr>
</tbody>
</table>

**Identification:**

An aqueous solution yields the reaction characteristic of Sodium and Potassium.

**Physiochemical Properties**

Loss on drying at 110°C - Not more than 4%

Acid insoluble ash - Not more than 1%

pH (10% aqueous solu.) - 10-11

**Assay**

Sodium - Not less than 4%

Potassium - Not less than 29%

Iron - Not less than 1.2%

**Storage:** Store in a cool place in tightly closed containers, protected from light and moisture.

**Kshar matra**

द्विगुण्जः समारथ्य रक्तिक्षेत्रसंभिताम्
क्षारस्तु विनियुञ्जीत साधारणतया भिषक्

(रस तरंगिणी१४/६४)

**Dose:** 2 -8 Gunja (250 mg-1,000 mg)

**Guna of Kshar (Properties)**

**Table 2** Properties of *Kshar* as per Vrihadtrayi

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Charak Samhita (11)</th>
<th>Sushruta Samhita (8)</th>
<th>Astang Hridaya (10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tikshna</td>
<td>Naati tikshana</td>
<td>Naati tikshana</td>
</tr>
<tr>
<td>2.</td>
<td>Ushna</td>
<td>Not so mridu</td>
<td>Not so mridu</td>
</tr>
<tr>
<td>3.</td>
<td>Laghu</td>
<td>Shukla</td>
<td>Sita (white)</td>
</tr>
<tr>
<td>4.</td>
<td>Ruksha</td>
<td>Shakshana</td>
<td>Pichchhila</td>
</tr>
<tr>
<td>5.</td>
<td>Kledi</td>
<td>Pichchhila</td>
<td>Shlakshana</td>
</tr>
<tr>
<td>6.</td>
<td>Pakta</td>
<td>Avishyandi</td>
<td>Avishyandi</td>
</tr>
<tr>
<td>7.</td>
<td>Vidarana</td>
<td>Shiva</td>
<td>Sukh nirvapya</td>
</tr>
<tr>
<td>8.</td>
<td>Dahkaraka</td>
<td>Shighrakari</td>
<td>Shighra gami</td>
</tr>
<tr>
<td>9.</td>
<td>Dipana</td>
<td></td>
<td>Shikhari</td>
</tr>
<tr>
<td>10.</td>
<td>Chhedana</td>
<td></td>
<td>Naati ruk</td>
</tr>
<tr>
<td>11.</td>
<td>Agni sadrish</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rasarnava** has mentioned that *mala nashaka* is the vishesh guna of kshar

1. Katu
2. Tikshna
3. Pachan
4. Daran
5. Shodhan
6. Vilaya
7. Stambhana
8. Saunyasa
9. Ushna
10. Dahan
11. Lekhan
12. Aamhar
13. Krimihar
14. Chedan
15. Punsatvanashak
16. Ropan
17. Medhara
18. Vishahar
19. Kusthhar
20. Kaphahar
21. Tridoshgana

**Properties of Kshar**

Because of the manufacture, it mitigates *tridoshas*, being a combination of many plants during its white in colour it is cool; though being cool,
its actions such as burning, ripening, bursting etc. are not hindered; because of predominance of aagneya drugs (drugs of fiery nature), it is pungent, hot, penetrates deep, causes ripening, liquification, purification, healing, absorbing (fluids), withholding and scarifying, destroys worms, undigested materials and kapha; cures leprosy and other skin diseases, poison and fat accumulation; if used in excess it even destroys masculinity.

Clinical uses of Kshar
1. Kshar Sutra
2. Kshar karma
3. Ksharodak
4. Ksharpichu

Practical training of kshar karma 15:
Training of kshar karma must be given on soft pieces of flesh.

Indications of pratisaraniya kshar 16:
Applying caustic alkali externally is indicated in leprosy, Dadrumandala, leucoderma, anal fistula, malignant tumors, hemorrhoids, septic ulcers, sinus ulcers, skin warts, pin heads, pigmented patches on the body and on the face, moles on the skin, external abscess, worms, diseases produced by poisons, the seven diseases of the mouth such as upjivhika, adhijivha, upkuhsa, and danta vaidarbha, three kinds of rohini and in those diseases where use of accessory instruments only has been indicated.

Contra-Indications:
Cauterization by alkali should not be done for persons such as debilitated, childern, old age, fearful, suffering from swelling all over the body, enlargement of the abdomen, bleeding disorders, pregnant lady, woman during menstruation, advanced stage of fever, diabetes, injury to the chest (lungs), emaciation injury, thirst, fainting and other complications, the impotent, prolapse of uterus and testes, in vital spots, throat, umbilicus, nail bed, penis, places with less muscle mass and eyes; excepting diseases of the eyelids 17.

Even those diseases which are curable with the use of alkali, in patients who have swelling all over the body, pain in the bones, poor appetite, pain in the heart and joints, alkali, will not succeed 18.

Indication of kshar in various diseases:
Ulcers, which are Hypertrophied, Hard, Itching, chronic in nature, difficult to treat should be cleaned with the help of kshar karma 19. All kshar cure abdominal tumors, piles, duodenal diseases, urinary gravel and calculi, are digestives, causes bleeding diseases and laxatives 20.

Dusht Vrana:
In case of septic wounds, purification both upwards and downwards, foods which causes thinning of the body and bloodletting should be done first; the wounds should be washed with decoction of drugs of either rajavrikshadi gana or sursadi gana; oil medicated with the same drugs is good for cleaning the wound; kshar or oil prepared with alkali may be used for the purpose. The surgeon who knows the strength of the disease and doshas, matra, kaal, agni bala, can use kshar at the places where surgery or agnikarma is indicated.

**Krimighna:**

In the context of Shashthi Upkramas, Sushruta has given indication of ksharodaka in the steps of krimighna_kriya; bark of saptparna, karanja, arka, nimba, and rajadan macerated in cow’s urine or solution of alkali is said beneficial for washing the wound. Fomentation of wound with ksharodaka should be done gently.

**Arsha:**

Four types of treatments are there for hemorrhoids:

1. Medicine
2. Kshar
3. Agni
4. Shastra

The haemorrhoidal masses which are soft, broad, deep rooted, and bulged up are treated with kshar karma.

**Arsh Dagdh Lakshan**

यदा मृदु समस्पशं पक्वजाम्बवसन्निः |
ईषत्सस्फुटटत्ताम्राग्रं सम्यग्दग्धस्य लक्षणम् ||१५४|| (गद निग्रह अर्षाधिकार:)

1. मृदु समस्पशं
2. पक्वजाम्बवसन्निः
3. ईषत्सस्फुट्टित तामायं

Mitigation of the disease (subsiding of symptoms like pain, swelling, bleeding etc.), feeling of lightness (of the diseased part), and stoppage of exudations are the symptoms of samyak dagdha. Pricking pain, itching, loss of movement and increase of the disease (aggravation of the symptoms) are the symptoms of heena dagdha (improper alkali cauterisation), in case of excessive cauterisation by alkali there will be burning sensation, ulceration, exudation, twisting pain in the body parts, exhaustion, severe thirst, fainting and even death.

**Bhagandar:**

In Ushtra-griv bhagandar, after probing, excision should be followed by kshar patan, in order to remove the decomposed foul smelling muscles. Being pitta predominant...
bhagandar, instead of agnikarma, kshar karma in indicated here\textsuperscript{27}.

In case of parisravi bhagandara, the exuding tracts are excised and burning of the tract is done either by kshar or red hot rod. If the fistulous tract is still having exudations and pain, it should be probed again and incise it either khajura patraka, chandradha, Chandra-chakra, suchimukha or avangmukha and burn the tract by fire or kshar again\textsuperscript{28}.

**Nadi Vrana:**

The textual reference of ksharsutra is found in nadi vrana chikitsa. The most popular treatment modality for fistula is kshar sutra. Kshar is coated on linen thread in a systematic manner, makes the beauty of wonderful drug delivery system. In persons who are emaciated, weak and frightful and if the ulcer is present in vital organs, it should be cut open by using kshar sutra. After considering the strength of the alkali, another thread soaked with alkali may be inserted after removing the previous medicated thread. The same procedure should be adopted for anal fistula and malignant tumors\textsuperscript{29}.

**Usefulness in abdominal surgery:**

In case of omentum comes out from the abdomen, sprinkle the kashar bhasma and krishn mritika powder over the medovarti, and excise it with honey coated red hot shastra after ligation. For excision the shastra is heated red hot, as heat itself is a sterilizing agent, so helps in minimizing microorganisms load in the wound\textsuperscript{30}.

**Granthii Rog:**

Granthi or tumors arising from non vital part of body may be excised followed by agnikarma; or after lekhan karma, kshar pratisaran may be practiced\textsuperscript{31}.

**Kaphaj Arbuda:**

Local application of paste of Gomutra with Kshar is useful in cases of kaphaj arbuda\textsuperscript{32}.

**Arbuda:**

Narrow base tumor should be tied with belt of tin, copper or lead from base and local application of kshar, agni or some surgical intervention may be done. The physician should apply caustic alkali, thermal cautery and sharp instruments many times without any hesitation and not harming the strength of the patient\textsuperscript{33}

**Galganda:**

Paste of various drugs mixed with Palash ksharodak is locally applied in cases of Kaphaj Galgand\textsuperscript{34}.

**Kshudra roga**

- In unripe aigallika kshudra rog, a specific kshar paste of shukti, shrughni and yava kshar is indicated\textsuperscript{35}. 
• In *Darunak rog* of scalp, washing of hairs with *kodo ksharodak* is recommended\(^{36}\).
• In *jatumani, tilkalak, mashak* etc., slow application of *kshar* or *agni* is done after excision\(^{37}\).
• In *valmik rog*, it should be excised and cleared by using caustic alkali or fire in the similar manner as in *arbuda*. *Pratisaran of kshar* should be done for the cleaning purpose of tissues\(^{38}\).

**Kushtha:**

This is the reference of *Charak samhita*. Here, *Acharya charak* is advocating the local application of *kshar* in *kushtha rog* after bloodletting in nonsurgical condition or sensory loss condition\(^{39}\).

**Sheetala:**

\[
\text{तत्रधूलिम् कुयााद् वनगोमय भस्मना |}  \\
(यो०० शीतला चि० ४)
\]

Dusting of vanyopal bhasma on blisters of *shitla* is recommended in *yog ratnakar* to prevent any secondary infection\(^{40}\).

**Danta Roga:**

• This is a beautiful description of Root Canal Treatment (RCT) by *Acharya Sushruta*. Root of teeth should be cleaned by instrument. After that *kshar* should be applied. Entire procedure should be *sheetal* (cold)\(^{41}\).

• This is the description of dental sinus or *dant nadi chikitsa*. Dental extraction followed by local application of *kshar* is done to prevent sepsis\(^{42}\).
• *Upjihva* or Ranula is treated by proper scrapping followed by *kshar* application\(^{43}\).

**CONCLUSION**

*Kshar karma* has wide scope for clinical purpose and research in *ayurveda*. More and more practice and training is required in this field. Commercial *Kshar* preparation should be promoted, so that the availability of drug for ready to use. Its preparation is cheap and easy. So, employment may be generated and will definitely help nation.
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