ABSTRACT

Kshara sutra is a well known and acclaimed medicated surgical ligature used to manage the various surgical disorders especially in diseases occurring in Anal region. Kshara sutra karma is a minimal invasive parasurgical measure capable of performing excision or hedana; by virtue of its mechanical pressure and phytochemical cauterization. Acharya sushruta has advised its use and method of application in nadi vrana, arbuda and bhagandara. Although he has described the preparation of kshara in detail and application of kshara sutra in the management of nadi vrana Dr. prof. P. J. Deshpandey et.al from banaras hindu university has worked in all respects of Kshara sootra in ascientific manner. Further, the work in this regard was carried out in various institutes of AYUSH all over the india and even in foreign countries like japan. more over the different types of kshara sutra have been designed at various institutes for use in the application of various surgical problem namely haemorrhoids,fistula – in –ano etc.

INTRODUCTION

Sushruta Samhita is one of the leading samhita of Vruthatrai. The Sushruta Samhita was written in the holy city of Kashi, sometimes around 1000B. C. Sushruta was primarily a surgeon and recognized as the Father of Surgery. In BHU studies on different types of kshara sutra e.g udumbar kshara sootra, papaya kshara sootra etc. The strandard Euphorbia nerifolia (Snuhi ksheera) based apamarga kshara sootra is one of them. Ingredients of latex of
Kshara sutra are barbour’s surgical linen thread 20G, latex of snuhi ksheera, caustic powder of Achyranthes aspera (apamarga kshara), powder of curcuma longa (haridra). Equipments are kshara sutra cabinet, kshara sutra hanger, pH meter, For sterilization UV tube light source, For air tight packing glass tube etc are used. The preparation of euphorbia nerifolia (snuhi ksheera) based apamarga kshara sootra is completed in 21 coatings over the threads. The order of coatings are snuhi latex 11 coats, snuhi latex + apamarga kshara (alternately) 7 coats each, snuhi latex + Haridra powder (Alternately) 3 each.

Table no. 1. [2]

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Equipments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbours surgical linen thread 20 G</td>
<td>Tensiometer, Silica bag</td>
</tr>
<tr>
<td>Latex of euphorbia nerifolia (snuhi ksheera)</td>
<td>pH meter, Glass tube</td>
</tr>
<tr>
<td>Caustic powder of achyranthes aspera (apamarga kshara)</td>
<td>Oven, Sterile gauge pieces</td>
</tr>
<tr>
<td>Powder of cucuma longa (haridra)</td>
<td>Glass tubes, UV Light source</td>
</tr>
<tr>
<td></td>
<td>Kshara sutra cabinet, Kshara sutra hanger</td>
</tr>
<tr>
<td></td>
<td>Incubator, Petromax blower flame</td>
</tr>
<tr>
<td></td>
<td>Petry dish</td>
</tr>
</tbody>
</table>

Thread

The principle in the selection of the linen thread for the preparation of kshara sutra is that it should be acceptable, should not cause contact reaction and when it is used for tight tying it should be in good tensile strength and should not tear. The thread should have the capacity of retaining the coating of medicaments. Thus, surgical barbours linen thread size 20G, has been found to be the best one after the other studies with regard to the thread. [3]

Latex

The idea behind the use of latex is that it is sticky in nature and forms a fine coating over the thread. [4]

Collection of haridra powder

A fine powder of the dried rhizome of curcuma longa is collected for the manufacture of kshara sutra, the haridra powder is used in the last three coating of kshara sutra as antiseptic and with anti histamic substance and also prevent the direct contact of kshara with the atmospheric air that can lessen the potency of ksara sutra therefore by the coating of haridra powder can be prevented and for a longer period. [5]
Apamarg kshara
Kshara is a product prepared by burning the plant and making the ash in water and keeping it overnight, after filtration the water is heated to get a fine white coloured powder. This preparation is referred in all the text books there are many plant which are assigned for preparation of kshara the studies using different kshara have been conducted and achyranthes aspera is found to have acceptable qualities with regards to the preparation of the thread and management of the disease afore said.[6]

Equipment
This is especially devised for preparation of kshara sutra the latest horizontal kshara sutra cabinet is adopted by the various departments few prefers vertical kshara sutra cabinets. It has two compartments side by side meant to put the kshara sutra hangers in proper way.it is completely closed cabinet maintain about 40⁰c constantly .it is also having the U.V light tube for steralition of apamaga kshara sutra, kshaa sutra cabinet has two chambers.[7]
1. Bigger chamber
2. Smaller chamber

The bigger chamber is meant for keeping the kshara sutra hangers while smaller chamber containg hot air blowers, fan etc. A thermometer is also fitted which will indicate the temperature inside the cabinet.

Hangers[7]
The kshara sutra hangers are the rectangular shaped structures, made up of thick aluminium/wooden strips of about 2cm in width and 4cm in thickness. It contains 2 short arms and 2 long arms.

Each hanger has small cut (notches) on the both side which are placed at a distance of 2-3cm froms each other. These notchs are meant for hooking barbours linen thread size 20 though out the width and length of the hanger

Advantages
1. To prevent the atmospheric dust particles from sticking over the wet threads.
2. To dries the coated thread rapidly.
3. To avoid contamination
4. To maintain sterilization through U.V.light.
5. It acts as a bactericidal through constant temperature.
6. By constant heat and dryness it prevents the hydrophilic activity of the coated medicated kshara sutra.

**Petry dish**

It should be autoclaved and is used for storage of apamarga kshara, snuhi kheer and haridra during their application over the thread. The petry dish is cleaned and autoclaved after each application.\(^8\)

**Glass tubes**

They are used for packing of the prepared kshara sutras the glass tubes are autoclaved.

**Technique of preparation**\(^9\)

1. Surgical linen thread size 20G is tied to one end of the hanger and hooded to all the four sides till the other end of the hanger is reached where it is tied snugly once again.
2. The thread are then smeared in snuhi latex with the help of a clean gauze. All the four sides of the thread are uniformly smeared the hanger is then placed in the cabinet the cabinet is closed properly and threads are kept dry with the help of two 200 watts bulbs and or hot air blower the same process is repeated eleven times. After each coating U.V. exposure is given to the thread for 20-30 minutes daily.
3. The twelfth coating is done by first smearing thread with snuhi latex and then passing the wet linen thread through a heap of finely powdered apamarga kshara. When all the threads are smeared with kshara the hanger is gently saken so that the excess kshara particles fell down. The hanger is now replaced in now replaced in the cabinet for drying and for U.V. light exposure. This process is repeated till seven coating of snuhi and apamarga kshara are achieved.
4. The remaining three coating are finally completed with snuhi and fine powder of turmeric. Snuhi latex is applied gently and uniformly over the thread and then the wet threads are passed through a heap of fine turmeric powder. After each coating the threads are dried in the cabinet and given U.V. light exposure for 30 minutes. Thus 21 coating over the threads are completed the order of coating can be summarized as follows.
Lahari et al.  World Journal of Pharmacy and Pharmaceutical Sciences

<table>
<thead>
<tr>
<th>S. no.</th>
<th>Coating</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>snuhi latex</td>
<td>= 11</td>
</tr>
<tr>
<td>2.</td>
<td>snuhilatex +apamarga kshara(alternately)</td>
<td>= 7 each</td>
</tr>
<tr>
<td>3.</td>
<td>snuhi latex + haridra poder (alternately)</td>
<td>= 3 each</td>
</tr>
<tr>
<td></td>
<td>Total numbers coating</td>
<td>= 21</td>
</tr>
</tbody>
</table>

 Thickness of thread after coating
The threads should have more or less uniform thickness, varying between 2.10± 0.11mm.\[^{10}\]

 Packing of kshara sootra
After this each thread measuring 11-12 inches is cut away at the two end overlying the wooden/aluminium strip and the threads are packed and sealed in oven dried sterile glass tubes. Packed threads are once again given U.V. light exposure for 30 minutes the whole process was done with gloved hands.

 Methods of labeling.\[^{11}\]
Following details were mentioned on the label put on each thread
1. Name
2. Date of manufacturing
3. Ph
4. Batch number

 Ph of different drugs in apamarga kshara sutra\[^{12}\] Table no. 2.

<table>
<thead>
<tr>
<th>Sr. no.</th>
<th>Drugs</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>snuhi latex</td>
<td>5.6</td>
</tr>
<tr>
<td>2.</td>
<td>apamarga kshara</td>
<td>10.2</td>
</tr>
<tr>
<td>3.</td>
<td>haridra powder</td>
<td>6.2</td>
</tr>
</tbody>
</table>

 Mechanism of action of kshara sutra
The kshara sutra as medicated encircling ligation is made up of, alkali powder and haridra powder coated in surgical linen threads size 20G in difinate order. The latex as coated firstly 11 times produces debridement of the tissues by the way of proteolytic enzymes present in the latex which act in acidic media only. But here it is worth to note that the moment kshara is added to it, The proteolytic action immediately ceases since, kshara is highly alkaline (pH9-11) and latex acid in nature (ph 5-6) being alkine in nature, (pH 5-6). Being alkali 9in nature, The kshara produces the debridement of the wound by the way of its hygroscopic and caustic nature.\[^{13}\]
Table no. 3.

<table>
<thead>
<tr>
<th>Indications of kshara sutra</th>
<th>Contraindication of kshara sutra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fistula in ano</td>
<td>Osteomyelitis of pelvic bones</td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>Osteomyelitis of femur</td>
</tr>
<tr>
<td>Chronic fissure in ano with fissure</td>
<td>Tuberculosis of hip joint</td>
</tr>
<tr>
<td>Neoplastic pedunculated swelling</td>
<td>Tuberculosis of spine</td>
</tr>
<tr>
<td>Chronic sinuses</td>
<td>Intra – abdominal cold abcess</td>
</tr>
<tr>
<td>Intra – abdominal cold abcess</td>
<td>Pelvic abcess</td>
</tr>
<tr>
<td>Corn</td>
<td>Regional ilitis</td>
</tr>
<tr>
<td>Rectal polyps and papillomas</td>
<td>Intra – abdominal cold abcess</td>
</tr>
<tr>
<td>Warts</td>
<td></td>
</tr>
<tr>
<td>Abscess Pilonidal sinus</td>
<td></td>
</tr>
</tbody>
</table>

Advantages of kshara sutra therapy\(^{[14]}\)

1. Simple, safe and sure treatment
2. Kshara sutra is chemical fistulectomy rather than surgical fistulectomy
3. It is simple minimum invasive surgical technique
4. Perfomed in minor O. T. conditions
5. Minimum investigations required
6. No hospitalization required, it is an ambulatory procedure
7. Only local / topical / block anesthesia required
8. No antibiotic coverage if required only after culture and antibiogram
9. Kshara sutra is also used in patient who are otherwise not fit for surgery e.g. diabetics, cardiac patient hypertensives
10. Cost effective – low cost
11. Minimum scar formation at the wound site

REFERENCE