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## ROLE OF PARASURGICAL PROCEDURES IN *SHALYA TANTRA*: A REVIEW OF *KSHARA KARMA, AGNI KARMA, AND RAKTAMOKSHANA*

**Dr. Abhishek Pathak**

Professor & HOD, Department of Shalya Tantra, Apex Institute of Ayurvedic Medicine and Hospital, Samaspur, Chunar, Mirzapur, U.P.

**Corresponding Author-** Dr. Abhishek Pathak, Professor & HOD, Department of Shalya Tantra, Apex Institute of Ayurvedic Medicine and Hospital, Samaspur, Chunar, Mirzapur, U.P.

**Email-** [abhivns81@gmail.com](mailto:abhivns81@gmail.com)

**Mob-** 94154 70579

### ABSTRACT

**Background** Para-surgical procedures are an important component of *Shalya Tantra* and occupy an intermediate position between conservative treatment and major surgical intervention. *Kshara Karma*, *Agnikarma*, and *Raktamokshana* are used for localized pain, swelling, bleeding, congestion, unhealthy tissue, anorectal disorders, chronic wounds, and selected musculoskeletal conditions. These procedures produce therapeutic effects through controlled chemical cauterization, thermal cauterization, and removal of vitiated or congested blood. **Aim** To review the role of *Kshara Karma*, *Agnikarma*, and *Raktamokshana* as para surgical procedures in *Shalya Tantra*. **Objectives** To describe the classical concept of para-surgical treatment. To review the preparation, actions, indications, and procedure of *Kshara Karma*. To explain the instruments, methods, and therapeutic role of *Agnikarma*. **Materials and Methods** A structured search of classical *Ayurvedic* texts, PubMed, PubMed Central, Google Scholar, and relevant reference lists was conducted up to June 2026. Clinical trials, comparative studies, pharmaceutical studies, systematic reviews, and contemporary surgical literature were included. The findings were synthesized narratively

because of heterogeneity in procedures and outcome measures. **Results & Discussion** The three procedures differ in their mechanisms and should be selected according to the nature, depth, location, and stage of the disease. Current evidence is promising but limited by small samples, variable protocols, open-label designs, and short follow-up. **Conclusion** *Kshara Karma*, *Agnikarma*, and *Raktamokshana* may provide effective minimally invasive options in properly selected patients. Standardized procedures, safety monitoring, and larger comparative clinical trials are required.

**Keywords:** *Shalya Tantra*; *Kshara Karma*; *Agnikarma*; *Raktamokshana*; *Kshara Sutra*; *Jalaukavacharana*

## INTRODUCTION

*Shalya Tantra* is the surgical branch of *Ayurveda* concerned with diseases requiring incision, excision, extraction, drainage, probing, suturing, cauterization, bloodletting, wound care, and reconstructive procedures. *Acharya Sushruta* described surgical instruments, operative methods, preoperative preparation, postoperative management, haemostasis, fractures, anorectal diseases, urinary disorders, and wound healing. The classical scope of *Shalya Tantra* included not only major operations but also several minimally invasive procedures performed through substances, heat, threads, and controlled blood removal.<sup>1-3</sup>

Para-surgical procedures produce surgical or tissue-modifying effects without extensive cutting and dissection. *Kshara Karma* acts through a plant-derived alkaline preparation that chemically cauterizes unhealthy tissue. *Agnikarma* involves the controlled application of heat to selected tissues or painful points. *Raktamokshana* consists of therapeutic blood removal through methods such as *Siravyadha*, *Prachchhana*, *Shringa*, *Alabu*, and *Jalaukavacharana*. Pharmaceutical and biological studies have provided possible scientific explanations for the alkaline action of *Kshara* and the anticoagulant and vasodilatory effects of medicinal leeches.<sup>4,5</sup>

Clinical research has evaluated *Apamarga Kshara* in haemorrhoids, *Agnikarma* in tennis elbow, and comparative applications of *Agnikarma* and *Raktamokshana* in lumbar pain. These studies reported improvement in symptoms such as pain, tenderness, bleeding, stiffness, swelling, and functional limitation. However, the therapeutic effect depended greatly upon patient selection, procedural skill, and the severity of the condition.<sup>6-8</sup>

Despite their increasing clinical use, the available literature remains heterogeneous. Variations exist in the preparation and strength of *Kshara*, temperature and duration of *Agnikarma*, quantity of blood removed, species and number of leeches, associated medicines, frequency of sittings, and follow-up periods. A structured review is therefore necessary to clarify their classical basis, contemporary relevance, evidence, limitations, and safety considerations.<sup>9</sup>

## **AIM AND OBJECTIVES**

### **Aim**

To review the role of *Kshara Karma*, *Agnikarma*, and *Raktamokshana* as para-surgical procedures in *Shalya Tantra*.

### **Objectives**

1. To describe the classical concept of para-surgical treatment.
2. To review the preparation, actions, indications, and procedure of *Kshara Karma*.
3. To explain the instruments, methods, and therapeutic role of *Agnikarma*.

## **MATERIALS AND METHODS**

This review was prepared through a structured search of *Sushruta Samhita*, *Charaka Samhita*, *Ashtanga Hridaya*, PubMed/MEDLINE, PubMed Central, Google Scholar, and reference lists of relevant publications up to June 2026. Search terms included “*Shalya Tantra*,” “para-surgical procedures,” “*Kshara Karma*,” “*Kshara Sutra*,” “*Agnikarma*,” “*Raktamokshana*,” “*Jalaukavacharana*,” “medicinal leech therapy,” “haemorrhoids,” “fistula-in-ano,” “osteoarthritis,” and “tennis elbow.” Classical descriptions, pharmaceutical studies, randomized trials, comparative studies, systematic reviews, and modern surgical literature were included. The review was reported in a structured narrative form using relevant principles of PRISMA 2020.<sup>9</sup>

## **CONCEPTUAL STUDY: AYURVEDIC REVIEW**

### **Concept of Para-Surgical Procedures**

Para-surgical procedures are therapeutic interventions that produce cutting, scraping, cauterizing, draining, haemostatic, decompressive, or blood-removing effects without extensive conventional surgery. They may be used as independent procedures, as

preparation before surgery, as postoperative treatment, or as alternatives in selected patients who do not require major operative intervention.

The choice of procedure depends upon:

- Nature and depth of the lesion
- Predominant *Dosha*
- Involvement of *Rakta*
- Presence of pain, swelling, bleeding, congestion, or unhealthy tissue
- Strength and age of the patient
- Anatomical location
- Chronicity and stage of the disease
- Response to previous treatment

*Kshara Karma* is preferred when chemical scraping, cauterization, or destruction of unhealthy tissue is required. *Agnikarma* is considered where heat, pain reduction, or haemostasis is needed. *Raktamokshana* is selected in conditions associated with localized *Rakta Dushti*, congestion, burning, redness, discoloration, and swelling.

### ***KSHARA KARMA***

*Kshara* is an alkaline preparation obtained mainly from the water-soluble ash of selected medicinal plants. It possesses the capacity to scrape, destroy, dissolve, or remove unhealthy tissue. It is described as superior to several surgical instruments because it can perform actions such as *Chedana*, *Bhedana*, *Lekhana*, and *Dahana* and can reach narrow or irregular areas.

### **3. Preparation**

The selected plant material is dried and burned completely. The ash is mixed with water and allowed to settle. The supernatant liquid is repeatedly filtered until a clear alkaline solution is obtained. The filtrate is then heated and concentrated to achieve the required consistency.

The final action of *Kshara* depends upon:

- Source plant
- Quality of ash

- Ratio of ash and water
- Number of filtrations
- Heating duration
- Final pH
- Concentration
- Storage conditions

#### 4. Classification

##### According to Administration

**1. *Paneeya Kshara*** It is administered internally in selected digestive, urinary, obstructive, and metabolic conditions.

**2. *Pratisaraniya Kshara*** It is applied directly to localized lesions such as *Arsha, Bhagandara, Nadi Vrana, Charmakeela*, and unhealthy granulation.

##### According to Strength

- *Mridu Kshara*: mild action for delicate or superficial tissues
- *Madhyama Kshara*: moderate action for controlled cauterization
- *Tikshna Kshara*: strong action for thick, fibrotic, chronic, or resistant lesions

#### 5. Actions

The main actions of *Kshara* include:

- *Chedana*: cutting or separation
- *Bhedana*: opening or penetration
- *Lekhana*: scraping
- *Dahana*: cauterization
- *Shodhana*: cleansing
- *Ropana*: healing
- *Stambhana*: control of bleeding
- *Kledahara*: reduction of moisture
- *Shothahara*: reduction of swelling

### **Procedure of *Pratisaraniya Kshara Karma***

The patient is clinically examined and written consent is obtained. The lesion is exposed, cleaned, and dried. Healthy surrounding tissue is protected with a suitable agent. *Kshara* is applied only over the target tissue using a controlled applicator. The application is continued until the expected colour and tissue changes appear. The *Kshara* is then removed and neutralized using an acidic or soothing substance. The area is reassessed for bleeding, excessive burn, and surrounding tissue injury. Appropriate dressing, diet, bowel regulation, and follow-up are advised.

### **7. Indications**

*Kshara Karma* may be used in selected cases of:

- First- and second-degree internal haemorrhoids
- Small prolapsing pile masses
- Warts and skin tags
- Unhealthy granulation
- Chronic sinus
- Selected superficial growths
- Sloughy wounds
- Fistula-in-ano through *Kshara Sutra*<sup>11</sup>

### **8. Contraindications**

The procedure should be avoided or used cautiously in pregnancy, severe anaemia, uncontrolled diabetes, bleeding disorders, inflammatory bowel disease, suspected malignancy, severe immunosuppression, deep lesions near major vessels or nerves, extensive haemorrhoids, anal stenosis, and poor wound-healing conditions.

### ***KSHARA SUTRA***

#### **Concept and Preparation**

*Kshara Sutra* is a medicated surgical thread coated repeatedly with substances such as *Snuhi Ksheera*, *Apamarga Kshara*, and *Haridra*. The prepared thread is inserted through a fistulous tract and tied as a medicated seton.

Its actions include:

- Continuous drainage
- Chemical cauterization
- Gradual cutting
- Destruction of unhealthy tract lining
- Removal of granulation tissue
- Simultaneous healing behind the thread

### **10. Application in Fistula-in-Ano**

The fistulous tract is assessed clinically and, where required, through magnetic resonance imaging or endoanal ultrasonography. The internal opening, external opening, course of the tract, sphincter involvement, abscess, and secondary extensions are identified. Under suitable anaesthesia, a probe is passed through the tract. The *Kshara Sutra* is drawn through and tied without excessive tension. It is replaced periodically until gradual cutting and healing are completed. A multicentric randomized trial demonstrated that *Kshara Sutra* could be used as an ambulatory treatment for fistula-in-ano, although the healing period was longer than conventional surgery.<sup>12</sup> Comparative studies have shown that *Kshara Sutra*, fistulotomy, and other sphincter-preserving procedures have different advantages depending upon fistula anatomy and complexity.<sup>13-15</sup>

### **Advantages**

- Continuous drainage of the fistulous tract
- Gradual cutting with simultaneous healing
- Limited requirement for major equipment
- Possible outpatient application
- Potential preservation of sphincter function
- Useful in selected recurrent cases

### **Limitations**

- Prolonged treatment
- Repeated thread changes

- Pain and burning
- Persistent discharge
- Requirement for regular follow-up
- Difficulty in complex branching fistulas
- Risk of secondary abscess and false passage

### **AGNIKARMA**

*Agnikarma* is the controlled application of therapeutic heat to a selected tissue or painful point using a heated instrument or substance. It is not uncontrolled burning. Proper performance requires selection of the instrument, temperature, duration, depth, pattern, and anatomical site.

### **14. Instruments**

Classical *Dahana Upakarana* include:

- *Pippali*
- *Godanta*
- *Shara*
- *Shalaka*
- *Jambavaushtha*
- Heated metallic probes
- Heated oil, ghee, honey, or wax

### **15. Classification According to Tissue**

- *Twak Dagdha*: superficial skin application
- *Mamsa Dagdha*: application over muscular tissue
- *Sira-Snayu Dagdha*: application involving vessels, tendons, or ligaments
- *Asthi-Sandhi Dagdha*: application in bone and joint disorders

### **16. Patterns**

Classical patterns include:

- *Bindu*: point pattern
- *Rekha*: linear pattern
- *Valaya*: circular pattern
- *Ardhachandra*: semicircular pattern
- *Svastika*: crossed pattern
- *Pratisarana*: broader surface application

### **Procedure**

The painful or diseased area is examined and marked. Contraindications are excluded, and consent is obtained. The selected *Shalaka* is heated and briefly applied at predetermined points. Excessive pressure, prolonged contact, and repeated heating of the same point are avoided. After the procedure, the area is cooled and dressed appropriately. The patient is observed for blistering, severe pain, deep burns, infection, bleeding, or scar formation.

### **Therapeutic Role**

*Agnikarma* is commonly used in:

- *Sandhigata Vata*
- *Snayugata Vata*
- Tennis elbow
- Heel pain
- Localized back pain
- Chronic tendon or ligament pain
- Selected superficial growths
- Small bleeding points

A randomized preliminary study reported improvement in pain, tenderness, and function in tennis elbow following *Agnikarma*. A comparative study in lumbar spondylosis showed symptomatic improvement with both *Agnikarma* and *Raktamokshana*. Clinical studies in knee osteoarthritis also reported reduction in pain, stiffness, and tenderness.<sup>16,17</sup>

### **Possible Mechanism**

## **Contraindications**

*Agnikarma* should be avoided in pregnancy, severe anaemia, active fever, uncontrolled diabetes, bleeding disorders, peripheral neuropathy, severe vascular disease, loss of sensation, active infection, suspected malignancy, severe debility, and areas near major nerves or vessels.

## **RAKTAMOKSHANA**

*Raktamokshana* is the controlled therapeutic removal of blood. It is selected when aggravated *Dosha*, particularly *Pitta*, is associated with *Rakta* and produces pain, burning, redness, discoloration, swelling, itching, congestion, or inflammation. The aim is not unrestricted blood removal. The method, quantity, anatomical site, frequency, and timing must be individualized according to the disease, patient strength, age, season, and condition of *Rakta*.<sup>18,19</sup>

## **Classification**

### ***Shastra Krita Raktamokshana***

- *Siravyadha*
- *Prachchhana*

### ***Anushastra Krita Raktamokshana***

- *Jalaukavacharana*
- *Shringa*
- *Alabu*
- *Ghati Yantra*

### ***Siravyadha***

*Siravyadha* involves controlled venepuncture for removal of a measured amount of blood. It requires anatomical knowledge, aseptic precautions, assessment of bleeding risk, and proper post-procedure haemostasis.

### ***Prachchhana***

*Prachchhana* involves multiple small superficial incisions over a localized area. The incisions should be shallow, non-overlapping, and away from major nerves, vessels, and vital structures.

### ***Shringa and Alabu***

*Shringa* and *Alabu* create negative pressure over a scarified area. They have similarities with modern wet cupping. Their use requires sterile equipment, controlled suction, and monitoring of blood loss.

### ***Jalaukavacharana***

*Jalaukavacharana* is the therapeutic application of medicinal leeches. It is considered a comparatively gentle method and is suitable for selected localized and sensitive conditions.

Leech saliva contains biologically active substances with:

- Anticoagulant action
- Antiplatelet action
- Vasodilatory effect
- Tissue-spreading effect
- Possible anti-inflammatory effect

### **Procedure**

The patient is assessed for anaemia, bleeding tendency, anticoagulant use, allergy, diabetes, immunosuppression, pregnancy, infection, and vascular disease. A medicinal leech obtained from a controlled source is placed over the cleaned site. The leech is allowed to attach and detach naturally. It should not be forcibly removed. After detachment, the site is covered with a sterile absorbent dressing and monitored for prolonged bleeding. A used leech must never be transferred to another patient.

### **Clinical Applications**

Potential applications include:

- Localized venous congestion
- Congested reconstructive flaps
- Replanted digits with impaired venous drainage
- Selected inflammatory swelling
- Knee osteoarthritis
- Chronic lateral epicondylitis
- Selected chronic wounds

Randomized studies have reported short-term pain reduction and functional improvement in knee osteoarthritis and chronic lateral epicondylitis following medicinal leech therapy.<sup>18,19</sup> Medicinal leeches have an important adjunctive role in reconstructive surgery when arterial inflow is present but venous outflow is inadequate. They provide temporary drainage until venous channels develop or definitive surgical correction is possible.<sup>20</sup>

### **Contraindications and Complications**

*Raktamokshana* should be avoided in:

- Severe anaemia
- Haemophilia
- Thrombocytopenia
- Uncontrolled anticoagulant therapy
- Severe hypotension
- Pregnancy
- Severe immunosuppression
- Active systemic infection
- Unstable cardiac disease
- Severe peripheral arterial disease

Important complications of leech therapy include prolonged bleeding, anaemia, itching, allergy, scarring, vasovagal reaction, and infection with *Aeromonas* species. Careful sourcing, aseptic precautions, monitoring of haemoglobin, and appropriate antimicrobial protocols are essential.<sup>21</sup>

### **GENERAL SAMPRAPTI OF CONDITIONS REQUIRING PARA-SURGICAL PROCEDURES**

Unhealthy diet, trauma, constipation, repeated strain, infection, poor hygiene, or disturbed circulation

↓

Aggravation of *Vata*, *Pitta*, and *Kapha*

↓

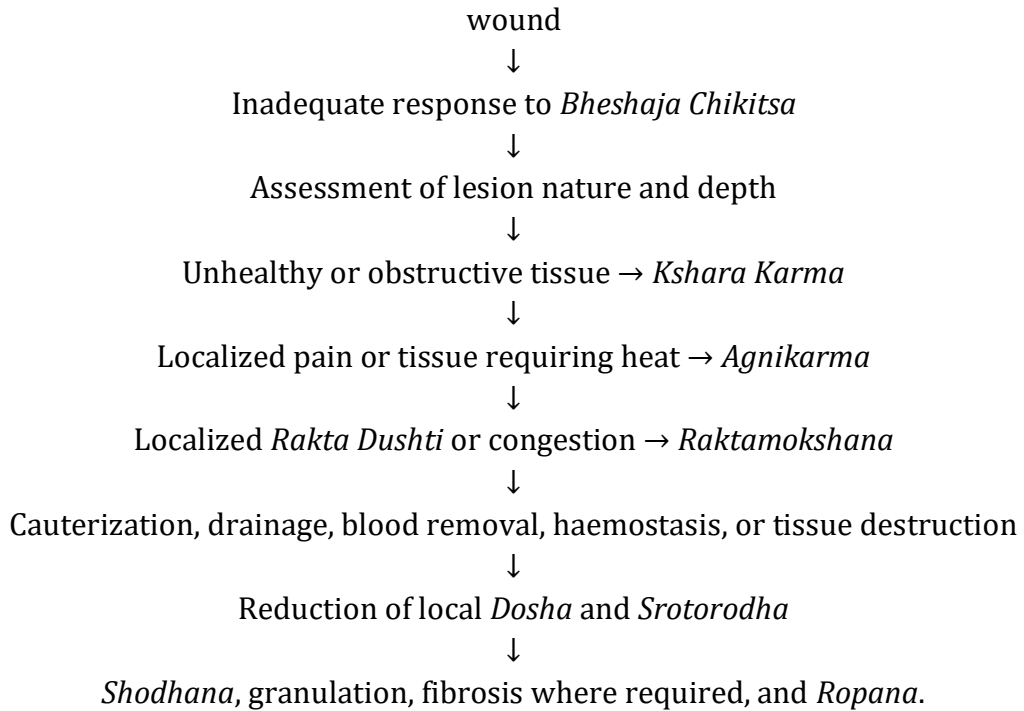
Involvement of *Rakta*, *Mamsa*, *Meda*, *Sira*, *Snayu*, or local *Srotas*

↓

*Dosha-Dushya Sammurchhana* at a vulnerable site

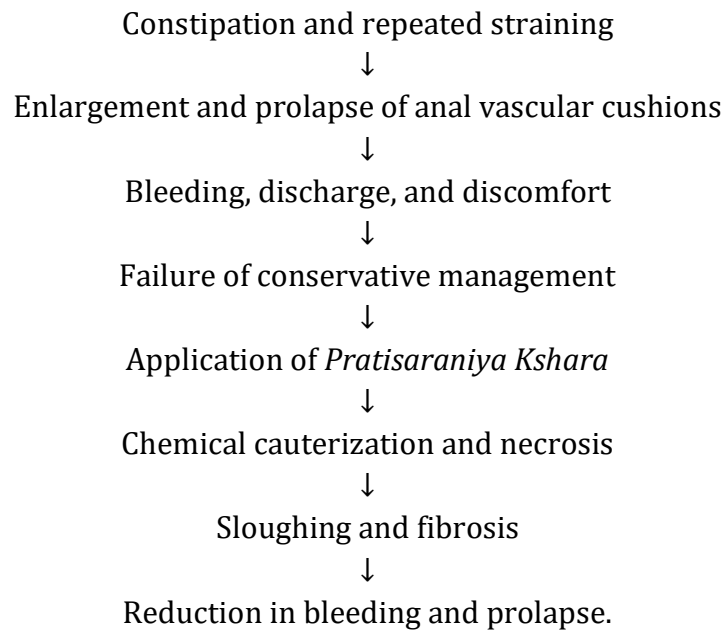
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Pain, swelling, bleeding, obstruction, congestion, fibrosis, unhealthy tissue, sinus, or chronic

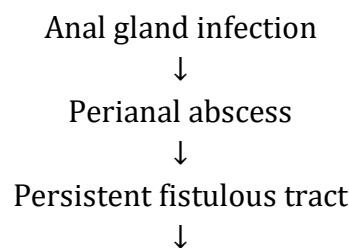


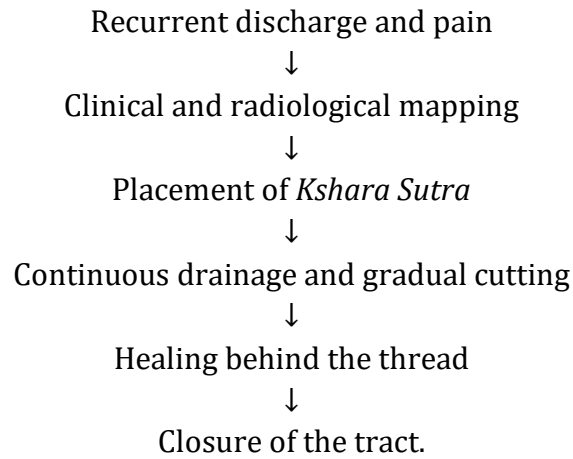
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##### **Haemorrhoids and *Kshara Karma***

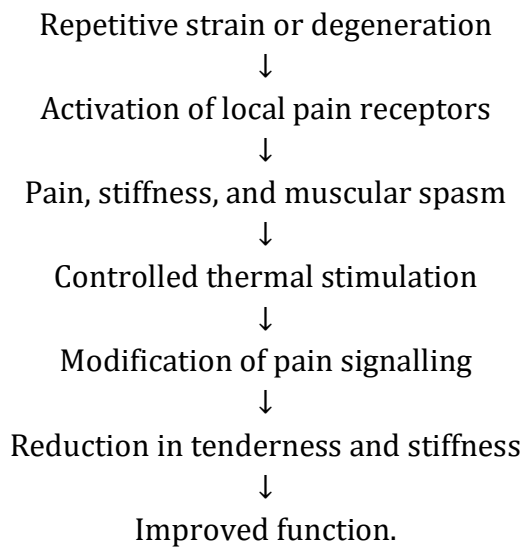


##### **Fistula-in-Ano and *Kshara Sutra***

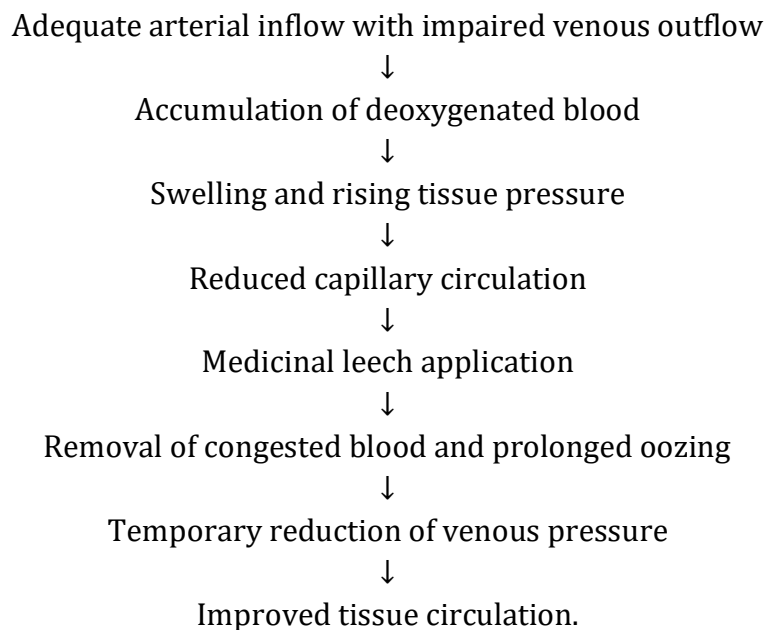




**Musculoskeletal Pain and *Agnikarma***



**Venous Congestion and *Jalaukavacharana***



## RESULT AND FINDINGS

- Para-surgical procedures occupy an important position between conservative management and major surgery.
- *Kshara Karma*, *Agnikarma*, and *Raktamokshana* possess different mechanisms and should not be used interchangeably.
- *Kshara Karma* produces controlled chemical cauterization, scraping, tissue destruction, and fibrosis.
- *Apamarga Kshara* has shown encouraging results in early internal haemorrhoids.
- Standardization of *Kshara* preparation, pH, strength, and contact duration is essential.<sup>4</sup>
- *Kshara Sutra* combines continuous drainage, chemical debridement, gradual cutting, and simultaneous healing.
- Clinical evidence supports *Kshara Sutra* as an option in selected fistula-in-ano, although prolonged treatment is a major limitation.
- *Agnikarma* may provide symptomatic relief in tennis elbow, lumbar pain, and knee osteoarthritis.
- Current evidence does not establish structural regeneration following *Agnikarma*.
- *Raktamokshana* includes both sharp and minimally invasive bloodletting methods.
- *Jalaukavacharana* has the strongest modern correlation with medicinal leech therapy.
- Leech therapy may provide short-term symptomatic benefit in knee osteoarthritis and lateral epicondylitis.
- Medicinal leeches have an accepted supportive role in selected cases of venous congestion in reconstructive surgery.
- Prolonged bleeding, anaemia, allergy, and infection are important risks of leech therapy.<sup>21</sup>
- Most clinical studies have small samples, variable procedures, limited blinding, and short follow-up.

## DISCUSSION

Para-surgical procedures demonstrate that classical *Shalya Tantra* included a graded and individualized approach to surgical disease. *Kshara Karma* was selected for unhealthy, elevated, obstructive, or fibrotic tissue; *Agnikarma* was applied where controlled heat, pain reduction, or haemostasis was required; and *Raktamokshana* was used where localized *Rakta Dushti*, burning, swelling, or congestion was prominent. Their clinical success depends upon matching the mechanism of the procedure with the dominant pathology.<sup>22</sup>

Contemporary evidence is strongest for specific indications rather than general use. *Apamarga Kshara* has shown encouraging results in early internal haemorrhoids, while *Kshara Sutra* has been studied in fistula-in-ano. *Agnikarma* has demonstrated symptomatic improvement in localized musculoskeletal pain. Medicinal leech therapy has shown benefit in selected painful conditions and has an established supportive role in venous congestion. However, most available trials contain small samples, variable techniques, associated treatments, and inadequate long-term follow-up.<sup>23</sup>

Future research should use standardized diagnostic criteria, proper randomization, independent outcome assessment, and systematic adverse-event reporting. Studies on *Kshara Karma* should document pH, concentration, contact duration, and neutralization. *Agnikarma* trials should report instrument material, temperature, duration, point pattern, burn depth, and healing time. Research on *Raktamokshana* should record blood loss, haemoglobin changes, leech species, infection-control measures, antimicrobial protocols, and complications. These improvements will help define the exact role of para-surgical procedures in safe and integrated surgical practice.<sup>24</sup>

## CONCLUSION

*Kshara Karma*, *Agnikarma*, and *Raktamokshana* are important para-surgical procedures of *Shalya Tantra*. *Kshara Karma* is mainly useful for chemical cauterization and removal of unhealthy tissue, particularly in selected haemorrhoids and fistula-in-ano through *Kshara Sutra*. *Agnikarma* may provide symptomatic benefit in localized painful musculoskeletal conditions through controlled thermal stimulation. *Raktamokshana*, especially *Jalaukavacharana*, may help in localized congestion and selected inflammatory or painful conditions. These procedures should be performed only after proper diagnosis, anatomical assessment, patient selection, informed consent, aseptic preparation, and planning for complications. Current evidence is encouraging, but larger multicentric trials and standardized protocols are required.

**CONFLICT OF INTEREST** -Nil.

**SOURCE OF SUPPORT** None.

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