

Review Article

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“AGNIKARMA IN MUSCULOSKELETAL PAIN: CLASSICAL BASIS, TECHNIQUE AND CURRENT EVIDENCE”**Tushar Tapadiya¹****AFFILIATIONS:**

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ABSTRACT

Background: Musculoskeletal pain conditions such as plantar fasciitis, knee osteoarthritis, lateral epicondylitis, sciatica and frozen shoulder are leading causes of disability worldwide. Agnikarma, therapeutic thermal cautery described by Sushruta, is widely used in Ayurvedic surgical practice for such pain, with claims of rapid and lasting relief. **Objective:** To review the classical basis, instruments and technique of Agnikarma, proposed mechanisms of action, and clinical evidence in musculoskeletal pain. **Methods:** Narrative review of Sushruta Samhita, reviews of Agnikarma research, and modern literature on thermal therapy, pain modulation and the closely related practice of moxibustion. **Results:** Sushruta describes Agnikarma as superior to Kshara and medicines for Vata and Kapha disorders of skin, muscle, tendon, bone and joint, and specifies the instruments, burn patterns, indications, contraindications and after-care. Reviews of Agnikarma research in knee osteoarthritis identified around 15 small Indian studies, most reporting reductions in pain, tenderness and stiffness, sometimes sustained for months, but without radiological change. A 2026 narrative review concluded that Agnikarma gives short-term pain relief in sciatica and osteoarthritis but that studies are small, heterogeneous and unstandardised. A meta-analysis of moxibustion, a related East Asian thermal therapy, found moderate evidence of pain reduction in knee osteoarthritis. Proposed mechanisms include counter-irritation, local vasodilation and modulation of pain signalling. **Conclusion:** Agnikarma is a low-cost, quick, outpatient procedure with promising but low-quality evidence. Standardised protocols for temperature, duration, points and number of sittings, and sham-controlled randomised trials, are needed. **KEYWORDS:** Agnikarma; thermal cautery; musculoskeletal pain; plantar fasciitis; knee osteoarthritis; sciatica; Shalya Tantra; moxibustion

INTRODUCTION

Musculoskeletal disorders are the leading contributors to the global need for rehabilitation, with low back pain and osteoarthritis among the most common^[1]. Plantar fasciitis is a frequent cause of heel pain in adults^[2], and lateral elbow tendinopathy is a common cause of elbow pain and work disability^[3]. Treatments include analgesics, anti-inflammatory drugs, physical therapy, injections and, occasionally, surgery. Many patients have persistent pain despite these measures, and long-term use of analgesics carries risks.

Agnikarma, literally “fire procedure”, is the application of heated metal or other instruments to specific points on the skin to produce controlled superficial burns. Sushruta describes it as one of the most important para-surgical procedures and claims that diseases treated by Agnikarma do not recur^[4]. In modern Ayurvedic surgical practice, Agnikarma is used widely for heel pain, knee osteoarthritis, sciatica, frozen shoulder, tennis elbow, low back pain, warts and corns.

This review describes the classical basis and technique of Agnikarma, discusses possible

mechanisms, summarises the clinical evidence, and identifies research needs.

METHODS

The classical source was Sushruta Samhita, Sutra Sthana 12 (Agnikarma Vidhi Adhyaya)^[4]. Reviews and clinical studies were identified through PubMed, Google Scholar and Ayurveda journals using Agnikarma, thermal cautery, heel pain, plantar fasciitis, osteoarthritis, sciatica, tennis elbow and frozen shoulder. Modern literature on thermal therapy, pain physiology and moxibustion was included to provide context. This is a narrative review.

CLASSICAL BASIS

Importance

Sushruta states that Agnikarma is superior to Kshara (caustic alkali) because diseases treated by it do not recur, and because conditions that cannot be cured by medicines, surgery or Kshara can be cured by Agnikarma^[4]. It is indicated mainly in disorders of Vata and Kapha.

Instruments (Dahanopakarana)

Sushruta lists different materials for different tissues^[4]:

Table 1: Instruments for Agnikarma by tissue level

Tissue level	Instruments described
Skin (Twak)	Pippali (long pepper), goat's dung, cow's tooth, arrow tip (Shara), Shalaka (probe)
Muscle (Mamsa)	Jambavaushtha (a black stone), metal instruments
Vessels, ligaments, joints and bones (Sira, Snayu, Sandhi, Asthi)	Honey, jaggery, oil, ghee or wax (heated)

In modern practice, metal Shalakas (probes) made of copper, iron, silver, gold or Panchadhatu (an alloy of five metals) are most commonly used, heated in a flame until red-hot and applied briefly to the skin.

Patterns of burns (Dahana Vishesha)

Sushruta describes several shapes of burn marks: Valaya (ring), Bindu (dot), Vilekha (lines), Pratisarana (rubbing), Ardhachandra (crescent), Swastika and Ashtapada (eight-pointed)^[4]. In current practice, Bindu (dot) and Vilekha (line) patterns are most often used, typically with ten to twelve dots per sitting over the most tender area^[5].

Indications and contraindications

Indications include severe pain in skin, muscle, tendon, ligament, bone and joint caused by Vata;

Granthi (cysts), Arsha (piles), Bhagandara (fistula), Arbuda (tumours), warts, corns, sinus and bleeding from severed vessels^[4]. Contraindications include Pitta-dominant persons, those with internal bleeding, ruptured abdomen, foreign bodies, weak persons, children, the elderly, the timid, those with many wounds, and those unfit for sweating^[4].

Samyak Dagdha Lakshana

Sushruta describes the signs of a proper burn on the skin, including a crackling sound, foul smell and contraction of the skin, and warns against excessive burning^[4]. He also classifies accidental burns into four degrees (Plushta, Durdagdha, Samyak Dagdha and Atidagdha), an early classification of burn depth that parallels the modern distinction between

superficial, partial-thickness and full-thickness burns^[6].

After-care

After Agnikarma, the burn is covered with honey and ghee to soothe and promote healing, and the patient is advised to avoid water at the site for a day and to follow a suitable diet^[4].

TECHNIQUE IN CURRENT PRACTICE

A typical procedure includes the following steps:

1. **Assessment:** clinical diagnosis, identification of the point of maximum tenderness and exclusion of contraindications such as diabetes with neuropathy, peripheral vascular disease, bleeding disorders and skin infection.
2. **Preparation:** the area is cleaned; in some centres, a paste of Kumari (Aloe vera) is applied to the surrounding skin.
3. **Heating:** the Shalaka is heated in a flame until red-hot.
4. **Application:** the tip is applied briefly to each point, producing a superficial burn; the number of points depends on the area, commonly 10 to 12 for heel pain or knee pain.
5. **After-care:** the burns are dressed with Aloe vera pulp, honey and ghee, or a turmeric-based paste; the patient keeps the area dry for 24 hours.
6. **Repetition:** sittings are usually repeated at weekly intervals for three to four sessions, depending on response.

POSSIBLE MECHANISMS OF ACTION

The mechanism of Agnikarma has not been established experimentally, and reviewers have explicitly called for mechanistic studies^[5,7]. Several plausible explanations can be drawn from pain physiology and thermal therapy.

Counter-irritation and descending inhibition

A brief, intense, localised noxious stimulus can reduce pain elsewhere through descending inhibitory pathways, a phenomenon known as diffuse noxious inhibitory controls or conditioned pain modulation^[8]. Conditioned pain modulation is often reduced in chronic pain states, and interventions that engage it may help restore endogenous pain control^[9]. Agnikarma produces exactly this kind of brief noxious stimulus at or near the site of chronic pain.

Gate control

The gate control theory proposes that activation of large sensory fibres can inhibit transmission of pain signals in the dorsal horn of the spinal cord^[10]. Thermal and mechanical stimulation of the skin around a painful area may modulate pain through this mechanism.

Local vasodilation and tissue effects

Heat causes vasodilation, increases local blood flow, reduces muscle spasm and may increase the extensibility of collagen tissues^[11]. A superficial burn also triggers a local inflammatory and healing response, which may remodel chronically degenerated tissue such as the plantar fascia or common extensor tendon, in a manner analogous to other “regenerative” injection or shock-wave therapies.

Ayurvedic explanation

In Ayurvedic terms, the hot, sharp and penetrating qualities of Agni oppose the cold, dry and mobile qualities of Vata and the cold, heavy and sticky qualities of Kapha, thereby relieving obstruction in the channels and pain.

CLINICAL EVIDENCE

Knee osteoarthritis

A review of Agnikarma research in knee osteoarthritis, written by a Shalya Tantra specialist from a national Ayurveda institute, summarised about 15 studies, most of them small Indian trials with 18 to 60 patients^[5]. Comparisons included Agnikarma alone, Agnikarma combined with oral Ayurvedic medicines such as Panchatikta Guggulu, and probes made of different metals. Most studies reported reduced pain, tenderness and stiffness, and some reported improved range of motion. Several found that combining Agnikarma with oral medicines worked better than either alone. One trial reported better results with gold probes than with Panchadhatu probes, and another found direct application more effective than a conductive method, which the author linked to higher temperature. Effects were reported to be sustained for up to six months in some studies. At least two studies found no radiological change, suggesting symptomatic rather than structural benefit. The review noted that many cited studies were theses or case reports and that sample sizes were small^[5].

Musculoskeletal pain more broadly

A 2026 narrative review of Agnikarma in musculoskeletal disorders, covering studies from 2015 to 2025, reported short-term pain relief and

longer-term improvement in joint function and mobility, mainly in sciatica and osteoarthritis^[7]. Several included studies suggested that Agnikarma worked better than, or complemented, other procedures such as Siravedha and Raktamokshana. The authors highlighted major limitations: no standardised temperature, duration or treatment points; small samples; short follow-up; and limited practitioner training. They concluded that larger controlled trials are needed before Agnikarma can be recommended in conventional care^[7].

Heel pain, tennis elbow and other conditions

Numerous clinical studies and case series report rapid relief of heel pain due to plantar fasciitis or calcaneal spur after one to four sittings of Agnikarma, often compared with Siravedha, leech therapy or oral medicines. Preliminary randomised studies have compared Agnikarma with therapeutic

ultrasound in tennis elbow. These studies are generally small and open-label, use non-standard outcome measures and have short follow-up.

Evidence from a related therapy: moxibustion

Moxibustion, the burning of mugwort near or on the skin at acupuncture points, is a thermal therapy from East Asian medicine with similarities to Agnikarma. An updated systematic review and meta-analysis found that moxibustion was effective for pain reduction and symptom management in knee osteoarthritis compared with sham moxibustion and oral drugs, but rated the evidence as moderate because of risk of bias and small samples^[12]. This suggests that thermal skin stimulation can produce clinically relevant analgesia, and offers a model for how Agnikarma trials could be designed, including sham controls.

Table 2: Summary of clinical evidence for Agnikarma

Condition	Evidence	Main finding	Certainty (authors' judgement)
Knee osteoarthritis	Review of ~15 small studies ^[5]	Reduced pain, tenderness, stiffness; no radiological change	Low
Sciatica and other musculoskeletal pain	Narrative review ^[7]	Short-term pain relief	Low
Plantar fasciitis, tennis elbow	Small open-label studies and case series	Rapid pain relief reported	Very low
Related thermal therapy (moxibustion)	Meta-analysis of RCTs ^[12]	Pain reduction in knee OA vs sham and drugs	Moderate

SAFETY

Agnikarma deliberately produces superficial burns, so safety depends on correct technique and patient selection. Possible adverse effects include blistering, infection, delayed healing, hyperpigmentation or hypopigmentation, and scarring, including hypertrophic scars or keloids in susceptible individuals. Patients with diabetes, peripheral neuropathy or peripheral vascular disease are at higher risk of poor healing and should generally not receive Agnikarma on the feet. Informed consent should explain the expected marks and the small risk of scarring. Clean instruments, controlled heating and appropriate wound care reduce risks.

STANDARDISATION AND RESEARCH NEEDS

Major barriers to evidence are the lack of standardised protocols and outcome measures. Research priorities include:

1. **Standardising the stimulus:** specifying probe material, tip size, temperature at contact (measured with thermocouples or infrared thermometers), contact duration, number of points, pattern and spacing.
2. **Sham controls:** developing a sham procedure, for example a probe heated to a lower temperature or applied without skin contact, to separate specific from non-specific effects.
3. **Comparators:** comparing Agnikarma with guideline-recommended treatments such as stretching, orthoses and manual therapy for plantar fasciitis^[13], or exercise and weight management for knee osteoarthritis^[14].

4. **Validated outcomes:** visual analogue scale, Foot Function Index, WOMAC, Patient-Rated Tennis Elbow Evaluation and quality-of-life measures, with follow-up of at least three to six months.
5. **Mechanistic studies:** measuring pressure pain thresholds, conditioned pain modulation, local blood flow, inflammatory markers and ultrasound changes in tissues such as plantar fascia thickness.
6. **Safety reporting:** systematic recording of burns, healing time, pigmentation and scarring.

DISCUSSION

Agnikarma is one of the most distinctive procedures in Ayurvedic surgery. Sushruta's description of instruments, burn patterns, indications, contraindications and burn classification shows a sophisticated understanding of therapeutic and accidental burns. The procedure is quick, inexpensive and suitable for outpatient settings, and clinical experience suggests rapid relief in many patients.

However, clinical evidence remains weak. Studies are small, open-label and unstandardised, and many are unpublished theses. Without sham-controlled trials, it is impossible to separate the specific effects of Agnikarma from placebo, natural recovery and concurrent treatments. The analogy with moxibustion, which has a more developed evidence base, suggests that thermal therapies can have real effects and that rigorous trials are feasible.

CONCLUSION

Agnikarma, described in detail by Sushruta, is a promising para-surgical treatment for musculoskeletal pain, particularly knee osteoarthritis, heel pain and sciatica. Current evidence from small studies is encouraging but of low certainty. Standardised protocols, sham-controlled randomised trials, validated outcome measures and mechanistic studies are needed to establish its place in pain management.

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