



## RESEARCH ARTICLE

### A REVIEW ON THE ACTION OF AGNIKARMA

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#### ABSTRACT

*Agnikarma* or thermal cauterization is one among the *anushastras* (substitute of surgical instrument) or para-surgical technique mentioned in Ayurveda. It is explained to provide complete relief in certain chronic diseases which are not cured by herbal medicine, surgical interventions and alkaline cauterization. Based on the specific heat retention and transmission capacity of different materials the ancient Indian surgeons had prescribed different materials like *pippali* (piper longum), *ajasakrut* (goats excreta), *godantha* (cow's tooth), *shara* (arrow), *shalaka* (metal Rods), *kshoudra* (honey), *guda* (jaggery), *sneha* (oil/fat) etc. for cauterizing specific body parts like skin, muscle, blood vessels, ligaments etc. According to the logic of the surgeon appropriate material should be selected for specific disease conditions. The mechanism of action of *agnikarma* is still obscure. *Agnikarma* act on a multi-factorial level in the body. Mainly it is indicated in the disease caused by *vata* and *kapha* because of its *tikshna* (quick action), *ushna* (Hotness), *sookshma* (subtle), *vyavayi* (Quick spreading), *vikashi* (works without being metabolised) properties to remove *srotorodha* (obstruction in channels of body). In this article an attempt is being made to unveil the principles of *agnikarma*.

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## INTRODUCTION

*Agnikarma* means procedure done with fire. References about *Agnikarma* are available in almost all *Ayurvedic* classics. It's preventive, curative and haemostatic properties were unveiled even centuries back. These same principles are adopted in advanced technologies like cauterization, diathermy, radiation therapy, laser therapy, stasion device etc. Clinically *Agnikarma* is the prime para-surgical procedure, to treat chronic diseases, which are mostly difficult to manage because of the antagonistic property of *doshas*, like disease caused by *vata* and *kapha*. *Agnikarma* can be done in all seasons except autumn and summer due to the increase in *pitta*, which generated out of the excessive hot climate (Susruta 2<sup>nd</sup> edition). Dalhana opines, in an emergency, even in any season it can be done. But precautions like covering the site with moist clothes, having cold foods and smearing cold pastes over the body has to be adopted, so that the *pitta* vitiation can be countered by the cold applications. Most commonly *Agnikarma* is done in neurogenic pain, tendinopathies or in diseases of skin, muscle, vein, ligament, bone or joint where

pain is an exclusive factor. It is also suggested in hyper-granulated neurogenic ulcers, sinuses, tumor, haemorrhoids, fistula-in-ano, warts, moles, trauma to joints and veins (Susruta et al., 2<sup>nd</sup> edition). *Agnikarma* is earmarked for its haemostatic properties as well. But in internal haemorrhage, multiple wounds and in rupture of internal organs it should not be practiced. Fearful persons, old aged, debilitated and children are also exempted because of their weak mental strength. In persons with dominant *Pitta* traits of the body (*pitha prakruthi*) and in un-retrieved foreign body which is a potent source of infection, the persons contraindicated for *swedana* are contraindicated for *Agnikarma* as it causes further vitiation of *pitta*. Based on the part where cauterization to be done and the ability of a material to retain and transmit heat energy, different instruments are enumerated by the ancient physicians. Substances which can retain less heat and can transmit lesser amount of heat energy are indicated for skin (*twak dagdha*) like piper longum, goat's, cow's tooth, wooden arrow and *shalaka*. Substances which can retain more heat energy and can transmit it to further deeper layers are used for burning the muscles, tendons and ligaments. For eg *jambavoshita* (a stone carved in the shape of *Eugenia jambolana* Lam.) and metals are used for transmitting the heat energy to the level of muscles and honey, jaggery or other viscous materials like oil, fat etc. are used to transmit the heat energy to ligaments,

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tendons or bloodvessels. (Susruta *et al.*, 2<sup>nd</sup> edition) Different Acharyas are having some difference in opinion regarding the instruments to be used.

involvement of tissue as *twak dagdha* (Skin burn), *mansa dagdha* (muscle burn), *Sira-snayu dagdha* (burn of tendon and vessels) and *asthi-sandhi dagdha* (burn of bone and Joints).

**Table 1. Instruments for thermal cauterization as per classics**

Instrument	Susruta	Charaka	Ashtanga Sangraha	Ashtanga Hridayam
Pippali	+	-	+	-
Aja shakrit	+	-	+	-
Godanta	+	-	+	+
Shara	+	+	+	+
Shalaka	+	-	+	-
Jamavostha	+	-	+	+
Dhatu	+	-	-	-
Madhu	+	+	+	+
Mudhuchista * <sup>1</sup>	+	+	+	-
Guda	+	-	+	+
Sneha * <sup>2</sup>	+	+	+	+
Yashtimadhu * <sup>3</sup>	-	-	+	-
Suchi * <sup>4</sup>	-	-	+	-
Varthi * <sup>5</sup>	-	-	-	+
Suryakantha * <sup>6</sup>	-	-	+	-

\*1 bee wax \*2 oil/fat \*3 Glycyrrhiza glabra \*4 needle \*5 wick \*6 sunstone

**Table 2. Signs of cauterization at various levels**

<i>Twak dagdha</i>	<i>Mamsa dagdha</i>	<i>Sira snayu dagdha</i>	<i>Sandhiasthi dagdha</i>
Shabda pradurbhava (production of sound)	Kapotha varnatha (colour of pigeon)	Krishnonnatha vranatha (ulcer being black and elevated)	Karkkashvranatha (roughness of wound)
Durgandhata (bad odour)	Alpaswayathuvedana, (mild swelling, pain)	sravasannirodhascha (cessation of exudation)	Asthira vranatha (lack of firmness)
Twak sankocha (constriction of skin)	Shushkasamkuchita vranatha (dryness and constriction)		

**Table 3. Disease specific sites for thermal cauterization**

Disease	Site
<i>Arshas</i> (haemorrhoids) <i>vata and kapha</i>	Site of <i>arshas</i>
<i>Antra vrudhi</i> (inguinal hernia)	Inguinal region
<i>Nadi vrana</i> : (sinus)	Track
<i>Pleha udara</i> (splenomegaly)	<i>Dakshina bahu sira at manibandha</i> (below the left thumb at the wrist)
<i>Kadara</i> (corn)	Spot
<i>Bhagandhara</i> (Fistula in ano): <i>kaphaja</i>	Fistula track
<i>Shonitha ati pravruithi</i> (bleeding)	Entire area
<i>Dushta vrana</i> (chronic non-healing ulcers)	<i>Agni karma</i> can be done by filling the wound
<i>Shiroroga</i> (head diseases) <i>Adhimantha</i> (glaucoma) <i>Anga shaidhilya</i> (weakness of body)	<i>Bhru, lalaada, shankha</i> (eyebrow, forehead or temple)
<i>Varthma rogaeshu</i> (diseases of eyelid)	<i>Varthma-roma-koopa</i>
<i>Snayu, asthi, sandhi</i> (ligament, bone and joint diseases)	Most tender spot
<i>Gridhrasi</i> (sciatica)	Achilles tendon ( <i>anthara kandara gulpha madhyae</i> ).

Exact site of *agnikarma* should be marked, cleaned and then, it is performed at the expected site as per the condition and up to the optimum sign of cauterization (*samyak dagdha lakshana*), without any complication, followed by application of mixture of honey & ghee or cold viscous substances. Based on the shapes of burns, *agnikarma* can be of either *valaya* (encircling the root of the diseased portion), *bindu* (dots made with the tip of salaka), *vilekha* (straight curved or horizontal lines drawn with salaka) or *pratisarana* (rubbing with the side of salaka) (Susruta *et al.*, 2<sup>nd</sup> edition). *Acharya Vagbhata in Ashtanga sangraha*, mentions that it can also be of *Ardhchandra* (semilunar), *swastika* (swastik sign shaped) or *Ashtapada* (directed in eight directions) (Ashtanga Sangraha of Vagbhata). It can be done at the site of disease (*sthanika* - e.g.; *kadara*) or at a different site (*sthanantariya*- e.g.; *gridhrasi*). Due precautions should also be taken when the burn extends beyond skin, hence it is classified clinically on the basis of

Depending upon the nature of material used for *agnikarma*, it can be done with viscous liquids (*Snigdha dravya* - eg; ghee) or with dry substances (*Ruksha dravya* - eg; pippali). The burn wound can be either *Plushtam* (insufficiently burnt/first degree burn), *durdagdha* (insufficiently burnt/second degree burn), *samyakdagdha* (properly burnt) or *atidagdha* (excessively burnt). Signs of proper cauterization (*Samyak Dagdha lakshana*) is identified with burns not very deep, having the color of ripe palm (brownish-black), easily healing and with mild pain. It is also associated with the respective symptoms explained in various levels of burns as follows.

The specific site for *agnikarma* is mentioned only for a few conditions in the classics. The rest has to be performed according to the logic of the physician. For example in it should be done at the (See Table 3).

## DISCUSSION

Clinically *Agnikarma* is the prime parasurgical procedure. Disease treated by *agni* will not recur again and is useful in treating chronic diseases. Due to its hot potency (*Ushna veerya*) and penetrating property (*Tikshna ushna guna*), it gives good result in *Vatha kaphaja* diseases, which are mostly difficult to manage because of the antagonistic property of *doshas*. And because of its *Ushna veerya* always there exist a possibility to vitiate the *pitta* and *raktha* inturn. Inorder to avoid this *Acharyas* have wisely given an advice to exempt the use of *Agnikarma* in the months of *sarath* and *greeshma*. While discussing about the contraindications an important area is regarding the *Swedaanarhas*. Those include obese, with predominant dryness in the body, debilitated, *vata* dominant condition, cataract, anemia, ascitis, herpes, cellulites/erysipelas, other skin diseases, diabetes, alcoholic intoxication and poisoning. In conditions like anemia, toxicity, alcoholic intoxication, erysipelas, cellulites and in skin diseases *Agnikarma* will cause further *pitta* vitiation. In diabetic patients it can delay the healing of the wound produced. In debilitated due to low mental and physical strength he cannot withstand the thermal cauterization. Even though *Acharya Susrutha* has explained three types of *dagdha*, a difference in opinion exist among a few *Acharyas*. According to *Kashyapa* it is not necessary to do *sirasnayu sandhiasthidagdha* as it can lead to complications like excessive bleeding. *Acharya Bhadra shounaka* gives another opinion that when *twak dagdha* is done the thermal energy is transmitted to *mamsa dagdha* and when *mamsa dagdha* is done the heat energy is transmitted to *sirasnayu –sandhi and asthi*. This suggestion can be substantiated from our routine clinical practice of cauterizing the skin at the heel in *Achilles tendinitis*. *Panchadhatu salaka* a recent innovation of *Prof. P D Guptha* is widely used for all types of cauterization. It is having 40% of copper, 30% of iron and silver, zinc, tin 10%, each. It can transmit more heat energy to deeper tissues with minimum tissue injury. The concept of *panchadhatu/loha* is mentioned in ancient text book of '*shilpashastra*' (<https://en.m.wikipedia.org/wiki/panchaloha>). These are the five metals present in human body. Studies have revealed that many individuals lack some of these metal components in the body. *Agnikarma* by this *shalaka* can help in refilling the components to bring stability and positivity in life. It can help in balancing the life force or *pranashakthi*.

The wonders created by *agnikarma* in clinical practice often make us spellbound. At times it produces instantaneous relief of chronic pain, tissue cutting, coagulation, blending, fulguration or wound healing. The actual mechanism of action of *agnikarma* still remains as an enigma to the medical community. Several theories can be adopted to explain these mechanisms but their action varies according to the condition. The theory of pro-inflammation- according to which the induction of an acute inflammation will gather more amount of lymphocytes, neutrophills, histamines and prostaglandins to the site and rectifies the chronic inflammation present at the site. The theory of thermodynamics applied upon a biological system- suggests that when thermal energy is transferred from an instrument to a tissue its internal energy increases and the heat energy gets transferred to the cells. The thermostatic centre of the body immediately gets activated to distribute this

localized rise in temperature throughout the body. As a result vasodilatation occurs and blood flow increases. According to *Van't Hoff's* principle the basal metabolism of the body increases by certain percentage for every  $1^{\circ}$  rise in body temperature ([https://en.m.wikipedia.org/wiki/Van't\\_Hoff\\_Equation](https://en.m.wikipedia.org/wiki/Van't_Hoff_Equation)). Rise in temperature induces relaxation of muscles & hence muscles spasm with inflammation and pain gets reduced. Muscles relaxes most readily when tissues are warm which in turn reduces the spasm, inflammation and pain

**Contact inhibition theory:** This theory may be applicable to the action of *agnikarma* in curing black mole or wart in skin. The theory suggests that when there is contact between adjacent cells, the cells do not divide due to a limiting factor known as "contact inhibition ([elitehealthcare.biz>starion-products](https://www.elitehealthcare.biz/starion-products)). So when skin cells are cut, the contact is lost since a gap is formed. This is how healing works, the cells will divide until they contact each other again; at that point contact inhibition correct the pathology. Coagulation of blood through cauterization involves the application of energy to denature tissue proteins, so that these proteins essentially become sticky and form a coagulum or clot. At the molecular level what happens is that the applied energy changes the three dimensional conformation of tissue proteins so that the protein chain is unraveled. This unraveling of the protein chain exposes hydrogen bonding side groups, in this unraveled state new hydrogen bonds can form not between groups on the same protein chain but between adjacent chains. In essence, these unraveled protein chains get stuck together and form a tangled intertwined matrix of protein strands. This is a physiochemical process and does not involve the biological coagulation cascades of the normal clotting mechanism ([https://en.m.wikipedia.org/wiki/contact\\_inhibition\\_theory](https://en.m.wikipedia.org/wiki/contact_inhibition_theory)).

The gate control theory of pain asserts that non-painful input closes the "gates" to painful input, which prevents pain sensation from traveling to the central nervous system. The thin (pain) and thick (touch, pressure, vibration) nerve fibers carry information from the site of injury to two destinations in the dorsal horn of the spinal cord: transmission cells (carry the pain signal up to the brain), and inhibitory interneuron (impede transmission cell activity) ([www.spine-health.com>conditions >motion](http://www.spine-health.com/conditions/motion)). Greater the large fiber activity relative to thin fiber activity at the inhibitory cell, so less pain is felt i.e. stimulation by non-noxious input is able to suppress pain. **Superficial nerve ending theory:** Free nerve endings can detect temperature, mechanical stimuli (touch, pressure, stretch) or pain. Thermal nociceptors are activated by noxious heat or cold at various temperatures. There are specific nociceptor transducers that are responsible for response to the thermal stimulus. The first to be discovered was TRP V1, and it has a threshold that coincides with the heat pain temperature of  $42^{\circ}\text{C}$ .

According to *Acharya Susrutha* *agnikarma* increases *pitta* which in turn leads to *raktha (blood) vitiation* This suddenly leads to *burning sensation, blister formation, fever* and *thirst* which may be correlated to acute immune respons to burn. (*Susrutha 2<sup>nd</sup> edition*) *Agnikarma* is *kapavatha shamana* due to its antagonistic properties. *Ushna (hot), tikshna (sharp), sukshma(subtle) properties* of *agni* remove blockage in

channels (*srotorodha*) and *ashukari* (*quick action*) property results in instantaneous relief. In Ayurvedic terms the analgesic action of *Agnikarma* can be explained as follows. Pain is caused anywhere in the body is due to *vata*. Skin is one of the seat of *vayu*; *agnikarma* is performed to release the *sangha* (obstruction) of *vayu*. Being an *Ushna chikitsa* it pacifies *vata*, and thus the pain is relieved immediately. *Agnikarma* also arrests the pathogenesis of a disease (*dosha dhushya vighatana karaka*). Because *ushna property* stimulate the tissue metabolism (*dathvagni*) and (combustion of the metabolic wastes) *amapachana* thus remove the *avarana*. *Agnikarma* is having the property of *sirasankochana* by that quality even it helps for *rakthasthambhana* (haemostasis).

## Conclusion

The *Agnikarma* deals with the action of thermal energy in the human body. It is a potent and minimally invasive parasurgical procedure which has wide application in chronic conditions as well as in emergency management. Its applications are widely practiced in modern surgical practice-viz. cauterization, laser, radiation etc. It has a wide number of applications which may be substantiated with numerous theories. New vistas of research should be opened up in this topic for achieving a crystal clear validation of its applications in Ayurveda.

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