

AGNIKARMA IN SHALAKYATANTRA.

Tarun Kumar Dwibedi¹, Veerayya R Hiremath², Nibedita Panda³, Shashikala K.⁴, Gururaj N.⁵.

1P.G. Scholar, 2 Professor and HOD, 4 Ass. Professor, Asst. Professor Dept. of Shalaky Tantra, SJGAMC&H, Koppal, Karnataka, India.

3 Consultant Dept. of Pancha Karma, R K Institute of Ayurvedic Medical Science, Dewraniya, Bareilly, UP.

ABSTRACT

Basic principles are the cause of invention and development. *Ayurved* is the base and origin of modern medicine and surgery. It is the oldest system of medicine that properly defines health and Treatment. *Ayurved* is composed of preventive, curative and well-planned dietary regimen or protocol for each diseases and protocol or procedures. *Bheshaja*, *Kshyara*, *Agnikarma* and *Shashtrakarma chikitsa* are known as the curative treatment in *Ayurved*. *Agnikarma* is the best among the parasurgical procedures or among *Chaturbidha Chikitsa-Upakrama*. Agni destroys the diseases and prevents reoccurrence. The father of modern health science, Hippocrates quoted that, "The diseases which medicines do not cure, iron cures; those which iron cannot cure, fire cures; and those which fire cannot cure, are to be reckoned wholly incurable. In the ancient India during the Vedic and *Samhita* period, the *Ayurved* scholars knew the concept of heat and its therapeutic uses over human body in oral cavity and even in the adnexa of eye in their disease condition. Regarding this, the detailed literature is available in different *Samhita* of *Ayurved*. The Cauterisation and its different forms are the developed state of Ancient *Agnikarma*. In both system of medicine, the heat therapy or *Agnikarma* is considered as the best treatment modality. Now a day, it is one of the unavoidable treatment modality in the surgical field. *Maharshi-Sushruta* (1500 BC) is considered as the father of Surgery. A detailed study that is the property, indications, contraindication, complication, preoperative, operative and postoperative care, along with the site of *Agnikarma* are available in his *Samhita*. Our *Ayurvedic* scholars even knew the application of *Agnikarma* in the *Urdhwajatrugata roga* that is application of therapeutic Agni or heat in the disease of Eye and its adnexa, Ear, Nose, Oral cavity and in headache. Cauterisation, electro cautery, diathermy, radiation and LASER therapy are the recent development based on *Agnikarma*. Though it is highly developed in Modern surgery, still we the *Ayurved* Scholars fails to provide its place in surgery of *Ayurved* and we have failed to develop it like the modern surgery did. Therefore, it is very essential to develop the acceptable *Agnikarma* procedure and to develop a Protocol or SOP in the *Ayurvedic* Surgical field.

Key words- *Agnikarma in UrdhwajatrugataRoga, Cauterisation, Electro Cautery, Diathermy, Radiation, LASER Therapy.*

INTRODUCTION

The *Agnikarma* is frequently used in all most all contemporary surgical procedures as Cauterisation, electro cautery, diathermy, radiation and LASER therapy. It is used to dissect, restore the hemostasis and to destroy tissue during surgery. Electrocautery and Diathermy are two possible techniques, which resembles the ultimate function of *Agnikarma*. *Agnikarma* is an ancient/classical parasurgical procedures explained in details by *Acharya Sushruta* and *Vridha Vagbhatta*. This procedure is practiced since 3000 years. The modern surgery also considers the same concept and develops the concept of Cauterisation, and LASER therapy. In practice, *Agnikarma* can be used as *Pradhana Karma* and *Paschat Karma* of many surgical procedures. *Agnikarma* is the best among *Shastra*, *Kshyara* and *Agnikarma* because; it prevents

reoccurrence^[1] and restores hemostasis during the procedure^[2]. Shalaky-Tantra deals with the disease above clavicle^[3]. There are many *Urdhwajatrugata roga* where the *Agnikarma* is used as *Pradhana Karma* and *Paschatkarma*. *Agnikarma* is an essential treatment modality for *Arbuda*, *Arsha* of *Karna*, *Nasa* and also in the disease like *Pakshamakopa*, *Pakshmo-poradha*, *Upapakshmamala*, *Jalarbuda*, *Medoja Galaganda*, and *Krimidanta*. In this study, we have aimed to present a clear image of *Agnikarma* in the *Nasa*, *Netra*, *Mukha*, *Karna Roga (Urdhwajatrugata Roga)* in details.

MATERIALS AND METHOD

Aim and objective:

- To elaborate and to discuss the concept of *Agnikarma* in *Urdhwajatrugata roga*.

Methodology:

- Literatures will be collected from different classical *Ayurvedic* texts, modern surgical books and from journals.
- The details of *Agnikarma* technique are discussed in details.

Literature review

Definition:

The word *Agni* is derived from the *Dhatu* 'Agativyapnoti'^[4] – it means, which spreads very quickly to everywhere. “*Agnina Kritva Yat Karma, Agne Sambandhi VaYat Karma, Tat Agnikarma*”^[5]. The word *Agnikarma* has been used in different context with different meanings. In *Ayurveda* *Agnikarma*, stands for the *Karmas*, which are done by using *Agni* that means procedure done with the help of Fire.

Table No. 1-Agnikarma references-

Samhita	Sthana	Context
Charaka Samhita	Sutra sthan 24/46	Sanyasha <i>chikitsa</i> (Trasana <i>chikitsa</i>)
Charaka Samhita	Sutrasthana 28/26	Manasa roga <i>chikitsa</i>
Sushruta Samhita	Sutrasthana 12	<i>Agnikarma</i> prakarana
Sushruta Samhita	<i>Chikitsa</i> Sthana 1/8	60 <i>Vrana Upakrama</i> and <i>Dahana</i> as <i>Upakrama</i> in <i>Skandana karma</i> (Coagulation).
Sushruta Samhita	Su.U.6/60, 14/5, 16/6,	As <i>Vrana Upakrama</i>
Astanga Sangraha	Sutrasthana 40	<i>Agnikarma</i> prakarana
Astanga Hridaya	Sutrasthana 30	<i>Agnikarma</i> and <i>Ksharakarma</i> prakarana
Astanga Hridaya	U.25/50-52	As <i>Vrana Upakrama</i>

Classifications and Types of Agnikarma-

- Agnikarma* is classified in to three types depending on the Desired *Dhatu Dahana*. Those are *Twak Dagdha*, *Mamsa Dagdha*, *Asthi*, *Sira* and *Snayu Dagdha*.
- Depending on the Consequences of *Dahana*^[6,7] *Agnikarma* is of four types. ***Tuchha/ Tuttha Dagdha, Plustha Dagdha***- In this condition, there will be Burn of *Twak* (Skin) with severe burning sensation. The lesion will be blister less. ***Durdagdha*** is achieved due to improper handling of the *Agnikarma*, which leads to formation of blister and severe pain. ***Atidagdha*** is characterized by muscle spasm, denudation or destruction, burning sensation, *Dhoomayana*, pain, thirsty, fainting, deep wound, destruction of *Sira Snayu* and even death. ***Sudagdha / Samyagdagdha***- it is said to be *Sudagdha*, When purpose of *Agnikarma* is achieved that is restoration of hemostasis, *Twak Daha* sound, *Lasika Yukta srava*, *Pakwa Tala Phala vat Varna*, Mild pain with less Healing time.
- According to **Location of Dahana karma**, *Agnikarma* can be classified in to; **Sthanika-** *Dahana Karma* is done at the Lesion or at the disease site, like *Puyalasa*, *Pakshmo-poradha*, *Upapakshma*,

Arsha and *Arbuda* of *Urdhwajatru* etc. and *Stanantariya* that is *Dahana Karma* done distant to the site of lesion, Ex. *Gridhrasi*.

➤ The *Agnikarma* technique can be used as *PradhanaKarma*. Here the purpose are; diseased tissue destruction, coagulation, prevention of reoccurrence and pain reduction. Some of the examples of *Agnikarma* as *Pradhana Karma* are -

- *Arsha*
- *Arbuda*
- *Bedana*
- *Abhisyanda*
- *Adhimantha*
- *Siroroga,*
- *Bhru Bedana*
- *Lalata Bedana*
- *Danta Nadi*
- *Shlistha Vartma*
- *Upa Pakshma*
- *Lagana*
- *Linganasha*
- *Ati Rakta-Srava*
- *Pakshma Kopa*



Agnikarma can be adopted as **Paschatkarma**, to achieve hemostasis after *Siraveda*, post-operative haemorrhage as in tooth extraction, in the *Krimidanta chikitsa*, after Filling of *Madhuchishtha* and Jaggery and after *Chhedana Karma* of *Arbuda*, to prevent reoccurrence.

- **Instruments for Agni-Dagdha (Table No. 2):** The type of *Dahanakarma* and type of instruments are disease specific. Specific instruments are recommended according to the location of disease and type of tissue involved. This instrumentation depends on the heat absorbing capacity and heat releasing capacity of the matter used for the *Dahanakarma*. Some of the instruments are enlisted in the following table according to the tissue and disease involved. Usually the *Khadira* and *Badara* Firewoods are recommended for *Agnikarma* procedure^[8].

Table No. 2 Instruments in different Dagdha:-

Type of <i>Dagdha</i>	Instruments used
<i>Twak Dagdha</i>	<i>Aja Sakrit, Pippali, Godanta, Shara, Shalaka, Suryakanta Mani</i>
<i>Mamsa Dagdha</i>	<i>Jambostha, Other Metals like, Lauha, Swarna, Tamra, Rajata and Kamshya</i>
<i>Asthi, Sira and Snayu Dagdha</i>	<i>Madhu chhista (Honeybee wax) and Sneha</i>
<i>Arsha, Bhagandara, Granthi, Nadi Vrana</i>	<i>Jambostha, Madhu, Sneha and Jaggery</i>

- **Other Instruments and medicines (Figure No. 1, 2, 3, 4, 5, 6, 7):** *Shalaka* like; *Ardhendu vaktra Shalaka, Kulatha dal tulya Shalaka, Suchi, Ghrita, Taila, Yasti* and *Satadhauta Ghrita* are also used for this purpose.



Bee wax (*Madhuchishtha*)



Cow teeth (-*Danta*)



Goat stool (*Aja Sakrit*)



Jaggery (*Guda*)



Piper Longum (*Pippali*)



Suryakanta Mani



Glycyrrhiza Glabra (Yasthimadhu)

Figure No. 1, 2, 3, 4, 5, 6, 7 Showing Dravya used in Agnikarma.

***Agnikarma* Procedures:** *Agnikarma* is recommended in every season except the *Grishma* and *Sarad ritu*^[9]. Contact time or heating time of *Agnikarma* should be very short that is for few seconds and should not exceed more than 1min., as there is chance of complication like severe burn. Some research scholar recommend the contact time of *Agnikarma* as follows-

Table No. 3 Showing heating time of Dahnopakarana used for Agnikarma^[10]

Sl.no	Dahan Dravya	Instrument of Heating	Period of heating
1.	Swarna-Suchi Shalaka	High pressure gas	2-3 second
2.	Tamra Shalaka	High pressure gas	6 second
3.	Raupya-Shalaka	High pressure gas	10-15 second
4.	Swarna-Shalaka	High pressure gas	10 second
5.	Haridrakhanda	Candle	40 second
6.	Gaja Pippali	Candle	60 second
7.	Aja Sakrit	Candle	55 second

➤ **Poorvakarma (Pre-Operative procedure of Agnikarma)**

The diet must be *Pichhila*. The patient should not be in empty stomach while doing *Urdhwajatrugata Agnikarma Chikitsa*. However, there is exception in *mukha roga*. Prior to *Agnikarma* the season, *Marma*, *Vyadhi Sthana* and its *Dhatu* involvement etc. should be considered^[11].

Ayurvedic Agnikarma pre-operative protocol

- Preparation of *Shalaka*, smoke less fire.
- Preparation of *Madhu*, *Ghrita* mixture and other emergency medicines and equipment.
- Prayer to Almighty. This may be to restore normal psychological state of patient and may be to provide relaxation to patient.
- Head must be towards the East direction and position according to the location of the Lesion.
- Disinfection or washing of desired area with *Triphala Kashaya*.
- The assistants or attendants immobilize the patient.

In current time below protocol are followed prior to the *Agnikarma*

- The Procedure must be described to the Patient and a proper written consent must be signed.
- Proper Aseptic measures is followed.
- Proper Assessment of the patient, Lesion and vitals of the patient are noted.
- Inj. TT. One ampoule IM.
- Inj. Xylocaine for Local anaesthesia around the lesion.

➤ **PradhanaKarma (Principal procedure of Agnikarma)**

Desired type of Agni *dagdha* lesions (**Figure No. 8**) are made over appropriate location or lesion. The shape and size of *Agnikarma* depends on the disease or diseased tissue. According to shape and size classical *Agnikarma* are, *Valaya* (Circular), *Bindu* (Dot), *Vilekha* (Making of different shapes by heated *Shalaka*), *Pratisarana*^[11] ((Rubbing at indicated site by heated *Shalaka*). In this concern *Bagvattachrya* added, *Ardha-chandra* (Crescent shape), *Swastika* (eight limbs in different directions), *Ashtapada*^[8] (specific shape of *Swastika Yantra*).

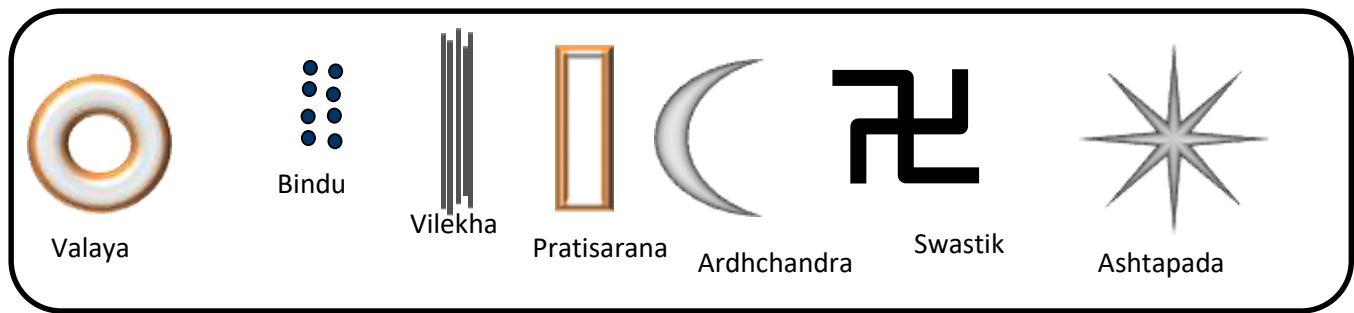


Figure No. 8 Showing shapes of Agnikarma lesions

- **Paschat Karma (Post Agnikarma Management)** ^[6]. For *Ropana Karma* purpose of *Dagdha Varna*, *Snigdha* and *Sheeta Dravya* or thick *Lepa* of *Yasthimadhu Choorna* along with *Madhu* and *Ghritha* are used. Some practitioner are also using the paste of *Ghrithakumari* and *haridra*.

Superiority and Benefits of Agnikarma: *Agnikarma* is a non-pharmacological treatment modality. The pain is comparatively less as compared to other *Shashtrakarma*. *Agnikarma* is an essential painless and a very effective *Ayurvedic* treatment modality, it is *Ashukari*, Prevents reoccurrence or recurrence is very rare ^[9]. It causes vasoconstriction, which check the haemorrhage ^[12]. Post-operative haemorrhage is nil or very less, Suture is not necessary for this procedure, Bandage is not needed in *Agnikarma*, Minimum Post-Operative care is required. *Agnikarma* can be used in the form of *Pradhanakarma* and *Paschatkarma*.

Complications of Agnikarma ^[13]: Though it is an effective treatment modality, still it has also few complications. Improper *Agnikarma* may even lead to death. Improper handling of *Agnikarma* procedure may lead to Blisters, Severe Burning, Pain, Thirst, Fainting, Tissue destruction (*Sira*, *Snayu*, and *Mamsa*), deep-wound, *Atidagdha* and *Durdagdha* *Laxana* and Death.

Pramadadagdha ^[6,8]: It is excessive burning by doctor and it is of four types, *Tuttha-Dagdha*, *Durdagdha*, *Samyagdagdha* and *Atidagdha*.

Contraindications of Agnikarma ^[8, 11]: *Agnikarma* must be avoided in *Sarad* and *Grishma Ritu*. In patients with *Pitta* aggravation, wounds containing *Shalya* (Foreign body), in eye except *Vartma Mandala* (Lid) ^[14] *Kostha* filled with *Rakta*, Multiple *Vrana*, on the *marma*, in case of *Bala*, *Vridha*, *Veeru* and *Durbala* Patients. *Agnikarma* is also contraindicated for those, who are contraindicated for *Swedana* like *Pandu*, *Meha*, *Trisha* and *Raktapitta* patients etc.

Samyak Yoga Laxana ^[6]: *Rakta Srava Shanti* in *Siraveda* and *Ati Rakta srava*, in *Twak Dagdha*, Sound of *Twak Dagdha*, *Lasika Yukta srava*, *Tala Phala* like color and *Kopata Varna*, in *Arbuda*; diseased tissue destruction and quick healing are the *Samyak Laxana* of *Agnikarma*.

Dagdha Chikitsa ^[6]: In *Samyagdagdha* the paste of *Tubakshiri*, *Plaksha*, *Raktachandna*, *Giloy Choorna* and *Ghritha* are applied over the lesion. Even if, it is not cured, then it must be treated like *Pittaja Vidradhi*. In *Durdagdha* lesion, *Sheetala upachara* (cold therapy), *Ushna upachara*, *Satadhauta Ghritha* application and *Sheeta Parisheka* are recommended. *Pittaja Visarpa vat chikitsa* is recommended for *Atidagdha* lesions.

AGNIKARMA IN URDHWAJATRUGATA ROGA

The basic concept of *Agnikarma* or the ancient *Agnikarma* Protocols are vividly available in the *Sushruta samhita sutra Sthana 12*, *Astanga Sangraha Sutra Sthana 40* and *Astanga Hridaya Sutra Sthana 30*. In the disease context of *Shalaky Tantra*, *Agnikarma* is specifically mentioned in the contexts of tissue destruction like *Arsha*, *Arbuda*, Disease of *Vartma*, for pain management purpose and to achieve hemostasis like in the case of dental extraction.

• SIRO ROGA

1. In *Siro Roga*, *Twak Daha* is applied on *Bhru*, *Lalata* and *Sankha Pradesha*^[11] with *Suryakanta Mani*, *Pippali*, *Aja Sakrit*, cow tooth, arrow and *Shalaka*.
2. In *Vataja Siro Soola*, if *Vata* is not balanced by the *chikitsa Upakrama* then the *Agnikarma* must be applied^[15].
3. *Ardhavabhedaka*—*Dahana/Agnikarma* is one of the treatment modality of *Ardhavabhedaka*^[16].

• NETRA ROGA

1. **BHRU BEDANA:** *Twak Daha* done with *Suryakanta Mani*, *Pippali*, *Aja Sakrit*, Cow Tooth, *Shara*, *Shalaka* over *Bhru*, *Lalata* and *Sankha Pradesha*^[8].
2. **PAKSHMA ROGA:** If it is not cured by *Shashtra karma* then *Kshyara karma* or *Agnikarma* is to be done. Evert the lid then the *Pratisarana* with *Kshyara* or *Agnikarma* is to be done on vitiated **Bali** (**Trichiasis**)^[17].
 - **Pakshmo-poradha:** the *Agnikarma* must be done by everting the lid, over the vitiated cilia and hair-root. The vitiated cilia is to be epilated by *Sadamsha Yantra* and that follicle or spot is to be burnt or *Dahana Karma* is to be done^[18]. *Lauha Shalaka*, *Dahana* to the hair follicle by saving the eye ball with wet cloth^[19].
 - **Upapakshmamala (Figure No. 9)**- *Agni* or *Kshyara Pratisarana*^[17].



Figure No. 9 Showing *Agnikarma* in *Upapakshmamala* (**Trichiasis, Dis trichiasis**).

3. VARTMA ROGA:--

- In **aggravated Vartma roga or upadrava Yukta**, *Agnikarma* must be done with a gap of *Mudga matra*. Here the *Bindu* type of *Twak Daha* is to be done^[20].
- In **Arbuda**, the *Arbuda* is to be excised from its root and *Lekhana* and *Pratisarana* is to be done followed by *Kshyara* and *Agnikarma*^[18]. The *Drishti*, which can be taken as *Cornea*, to be covered with wet cloth or cotton and *Agnikarma* to be done at lid margin over the hair follicle, root^[11].
- **Lagana (Figure No.10):** In Large Size of *Lagana*, *Kshyara* and *Agnikarma* are done^[21]. If *Lagana* is not cured by the treatment of *Kaphotklishtha chikitsa*, then *Agnikarma* is to be followed^[22]. After Proper *Siraveda* (Vein Puncture) *Agnikarma* done with *Jambostha*, *Shalaka*, *Suchi*, *Madhuchishtha*, *Guda*, *Sneha* over the stable *Sira*^[8].

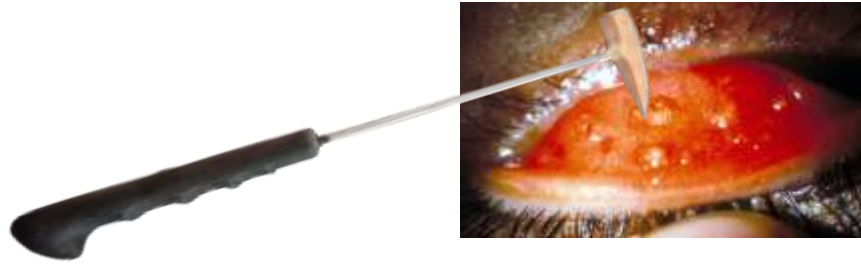
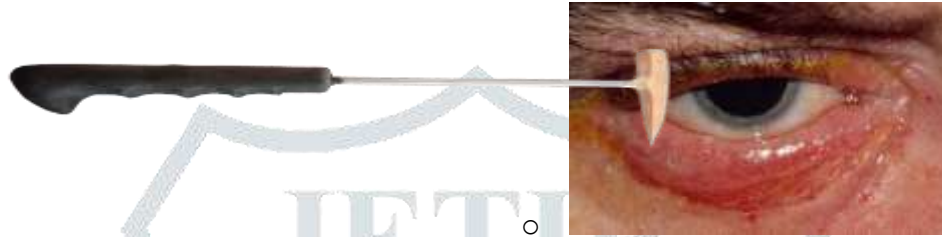


Figure No.10 Showing Agnikarma in Lagana

- **Visha Vartma:** Agnikarma is one of the treatment modality^[22].
- **Shlistha Vartma (Figure No. 11):** Mamsa Daha is applied with, Madhu-Sneha, Guda, Jambostha Yantra^[22, 23].



○ Figure No. 11 Showing Agnikarma in Shlistha Vartma

- In *Ati rakta pravrutti*, *Shlistha Vartma*, *Upapakshma*, *Lagana*, *Linganasha* and *Danta Nadi*, after Proper *Siraveda* (Vein Puncture) Agnikarma is applied with *Jambostha*, *Shalaka*, *Suchi*, *Madhuchishtha*, *Guda*, *Sneha* over the appropriate area according to the disease on the stable *Sira*^[8] and *Mamsa Daha* may also be adopted^[6, 11].
- **Upapakshma (Figure No. 12):** Agnikarma and *Ksharakarma* are followed by everting the lid^[24]. In this case *Lakshya* marking followed by Agnikarma and then *Vrana vat upachara* is followed^[24]. After Proper *Siraveda* (Vein Puncture) Agnikarma done with *Jambostha*, *Shalaka*, *Suchi*, *Madhuchishtha*, *Guda*, *Sneha* over the appropriate area on the stable *Sira*^[8].



Figure No. 12 Showing Agnikarma in Upapakshma

- **Arsha-Arbuda:** After *Mrudu Swedana*, the lid is everted and the mass is lifted by *Suchi* then excision of the *Arsha* or *Arbuda* mass followed by *Pratisarana* and when bleeding stopped, Agnikarma is to be done with Red hot *Shalaka* to destroy the remaining mass of diseased tissue^[25].

4. SANDHIGATA ROGA

- If *Puyalasa (Pilla Roga)* is not cured with indicated Treatment modalities then Agnikarma is helpful with *Sukshma Shalaka*^[26].
- **Alaji /Bahya Alaji-** In the ruptured condition, *Lekhana karma* followed by *Kshara* and Agnikarma is applied^[24].
- **Bahya Alaji-** Incision followed by *Kshara* or Agnikarma is indicated^[18].

5. SARVAGATA ROGA

- **Abhisyanda:** *Twag Dagdha* is indicated over *Bhru*, *Sankha*, and *Lalata* with *Suryakanta Mani*^[8]

- **Adhimantha:** If *Vataja-Adhimantha* is not alleviating with Oral medications then *Twag Dagdha* is indicated over *Bhru*^[27], *Lalata* and *Sankha Pradesha*^[11] with *Suryakanta Mani*^[8].
- If *Adhimantha* is not cured with indicated *Oushadha* and *Sira Mokshyana* then *Agnikarma* is recommended over the *Bhru*^[28]
- If *Adhimantha* is not cured with *Chhedana* of *Sira* then *Agnikarma* above *Bhru* is recommended^[29].

6. DRISHTI GATA ROGA

- In *Nili / Linganasha* after Proper *Siraveda* (Vein Puncture), *Mamsa Daha* done with *Jambostha*, *Shalaka*, *Suchi*, *Madhuchishtha*, *Guda*, *Sneha* over the appropriate area according to the disease on the stable *Sira*^[6, 8].
 - *Daha karma* at *Bhru Madhya* can be done^[30]. *Twak Daha* is to be done with *Suryakanta Mani* in *Linganasha*^[30] In the *Siraveda* at *Apanga* of *Linganasha*, causes inflammation, pain and bleed, this will be managed with *Dahana* i.e. *Agnikarma Bhru Madhya*^[30]. After *Siraveda*, there will be different type of pain, so to reduce this *Parisheka* with *Ghrita Paka* done with *Yasthimadhu* and milk or *Dahana Karma*^[30].
- **Contraindication in Netra roga:** *Agnikarma* is contraindicated over *Sukla* and *Krishna bhaga* of *Netra*.
- **NASA GATA ROGA (Figure No. 13, 14)**
 - *Mamsa Daha* is indicated with *Jambostha*, *Suchi*, *Shalaka*, *Ghrita*, *Guda*, *Madhu*, *Yasthimadhu*, *Taila*, *Vasa*, *Sneha*, *Swarna*, *Lauha*, *Lauha*, *Raupya* and *Kamshya* on *Arsha* and *Arbuda*.
 - **Nasarsha and Arbuda:** General, management of *Arsha* is excision followed by *Agnikarma*. So *Agnikarma* is a treatment protocol for *Arsha* occurring in any location^[31]. In *Nasa Arsha* and *Arbuda*, *Agnikarma* or *Ksharakarma* is adopted followed by application of *Pichu-Varti*, prepared with *Danti Beeza*, *Nishotha*, *Saindhava*, *Manahshila*, *Hartala*, *Pippali*, *Chitraka Moola*, which is applied with *Ghee* and *Madhu*^[32].
 - In *Arsha*, appropriate *Kshara* and *Agnikarma* must be done. In *Sthula Arsha*, *Chhedana Karma* followed by *Dahana* then *Shita Pradeha* is indicated^[33].
 - **Arbuda** --The mass is held with *Badisha Yantra* then excised by *Mandalagra Shastra*, followed by *Taila Dahana* with *Shalaka* and *Shita Pradeha* is applied to the wound^[33].



Figure No. 13, 14 Showing *Agnikarma* in *Nasarsha* and *Arbuda*

Common Kaphaja Arbuda Chikitsa: Flies are attracted by application of *Kulatha Kalka*, *Mamsa* paste, *Dadhi*, *Matsu* etc. Those Flies produces *Krimi*. Those *Krimi* fed upon the *Kaphaja Arbuda*. Then *Lekhana karma* is applied over the rest of *Arbuda* followed by *Agnikarma*. Careful *Kshara* and *Agnikarma* is also applied to the *Kaphaja Arbuda*^[34]

- **KARNA ROGA**

- **Arsha (Figure No. 15)**- General, management of Arsha is excision followed by Agnikarma^[31]. Arsha and Arbuda of is to be treated like Nasa-Arsha and Arbuda^[35], i.e. Kshyara and Agnikarma followed by Application of Danti etc. Pichu-Varti application to the EAC^[35]. Agnikarma is to be done with Kshara-karma followed by application of Pichu-Varti, prepared with Danti Beeja, Nishotha, Saindhava, Manahshila, Hartala, Pippali, Chitraka-Moola and applied with Ghee and Madhu to the Nasal cavity^[32]. In large Arsha, Chhedana karma followed by Agnikarma is indicated^[31].
- **Arbuda**: The Arbuda mass is held with Badisha Yantra and excised by Mandalagra Shastra followed by Taila Dahana with Shalaka and Shita Pradeha is applied to the wound^[33]

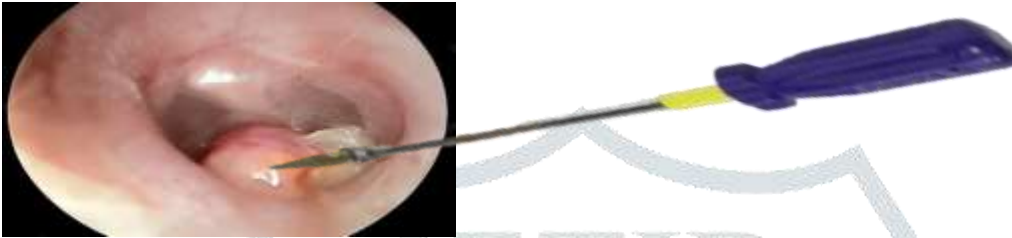


Figure No. 15 Showing Agnikarma in Karna Arsha

- **MUKHA ROGA** (Table No. 5)

- i. **OSTHA**

- **Medoja Osth Roga (Figure No.16)**-Swedana is done prior to incision then Meda is removed and Pratisarana Agnikarma is done^[36, 37]. Meda is removed by Vedanakarma followed by Agnikarma. Then Pratisarana-karma with Priyangu, Lodhra and Triphala etc.^[38].



Figure No.16 Showing Agnikarma in Medoja osth Roga

- **Jalarbuda (Figure No. 17)** - If Jalarbuda is large and spread to deeper tissue then Kshyara or Agnikarma is applied followed by Ropana-Karma^[36, 37].



Figure No. 17 Showing Agnikarma in Jalarbuda

ii. DANTAMOOOLA GATA ROGA

1. **Danta Vidradhi (Figure No. 18):** If the *Vidradhi* is Hard and deep, then *Vedana* (incision) followed by *Agnikarma* [39] If the *Danta Vidradhi* gets *Paka*, Incision is to be done followed by *Agnikarma* [40].

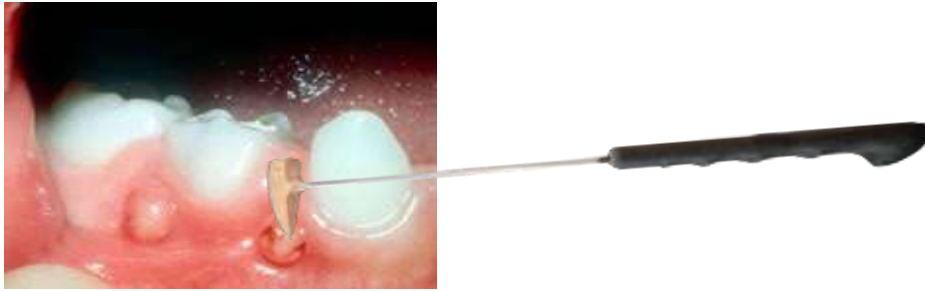


Figure No. 18 Showing *Agnikarma* in *Danta Vidradhi*

2. **Vardhana/ Kalli Vardhana/ Adhidanta (Figure No. 19):** In this condition, if tooth extraction followed by Haemorrhage then *Agnikarma* and *Ropana Karma* is indicated [41, 42].



Figure No. 19 Showing *Agnikarma* in *Adhidanta*

3. **Danta Nadi:** In *Danta Nadi* after Proper *Siraveda* (Vein Puncture) *Agnikarma* done with *Jambostha*, *Shalaka*, *Suchi*, *Madhuchishtha*, *Guda*, *Sneha* over the appropriate area according to the disease and on the stable *Sira*[8]. If *Danta*, associated with Zigzag, deeply seated multiple sinuses, then wax (*Madhuchishtha*) and Jaggery to be filled and *Agnikarma* is to be performed with *Shalaka* [43, 44].
 - If *Nadi-Vrana* is not cured by the excision of *Danta-Mamsa* then the diseased tooth is to be extracted and *Agnikarma* is to be done [45]. If the *Nadi-Vrana* (sinus) is present near the tooth then the diseased gingiva is to be excised followed by *Agnikarma* [46].

iii. DANTA ROGA

- **Dalana / Sheeta Danta (Figure No. 20):** In this condition the *Swedana Karma* is to be done over *Danta Moola* followed by *Danta Moola Lekhana* with *Brihi Mukha Shastra* then *Daha karma* with *Ushna Taila* followed by *Pratisarana* [36, 37].



Figure No. 20 Showing *Agnikarma* in *Dalana*

- **Krimidanta (Figure No. 21):**-Tooth Cavity to be filled with (*Madhuchishtha* with *Guda* or *Ghrta*) then *Agnikarma* is performed with Blunt and bend *Shalaka* [8, 47]. After the mobile tooth extraction, *Agnikarma* is indicated to achieve Haemorrhage [48].

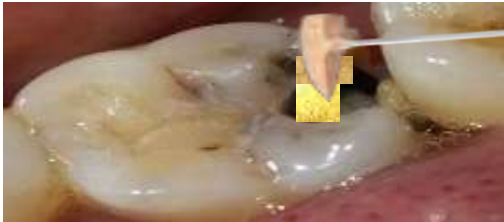


Figure No. 21 Showing Agnikarma in Krimidanta

- **Adhidanta:** After Tooth Extraction, Agnikarma is indicated for Rakta-Skandana [42] (coagulation).
- **KANTHA ROGA (Figure No. 22, Table No. 8)**
- **Medoja Galaganda:-** In Medoja Galaganda, after incision, Meda is removed followed by Daha karma with hot Meda, Madhu, Majja and Ghrita then Madhu and Ghrita is applied followed by Lepa with Kashisa, Tuttha, Gorochana Choorna and Vrana Upakrama like, Lepa and Gaadha Bandha (tight bandage) etc. is indicated [49].
- If Medoja Galaganda is not cured With Shastra Karma then Dahana with any one among Vasa, Ghrita, and Madhu is done followed by Vrana Ropana Karma [50]. Agnikarma is one of the treatment modality for Medoja-Galaganda [8].
- **Gandamala-** Agnikarma is one of the treatment modality for Gandamala [8].



Figure No. 22 Showing Agnikarma in Galaganda

Table No. 4, 5, 6, 7 and 8 showing indications of Agnikarma with their purpose.

NETRA ROGA	DISEASE CORELATION	LOCATION OF AGNIKARMA	PURPOSE OF AGNIKARMA
Vartma Roga	Disease of alpalbral conjunctiva	Over the Vartma(Palpabral conjunctiva)	Diseased Tissue Destruction, Prevents Reoccurrence
Pakshamakopa	Trichiasis, Entropion, Districhiasis	over Lid margin or over hair follicle.	Diseased hair follicle Destruction,Prevents Reoccurrence
Pakshmo-poradha	Trichiasis, Entropion,	over Lid margin or over hair follicle.	Diseased hair follicle Destruction,Prevents Reoccurrence
Upapakshma	Districhiasis	over Lid margin or over hair follicle.	Diseased hair follicle Destruction,Prevents Reoccurrence
Shlitha Vartma	Blepharitis	over Lid margin or over the diseased tissue	Diseased Tissue Destruction
Visa Vartma		Incision over the lesion and Agnikarma	Diseased Tissue Destruction
Krichhrammeela	Blepharospasm	over Lid margin or over the diseased tissue	Diseased Tissue Destruction
Alaji	Ext. Hordeolum, Dacryocystitis	Incision over the lesion and Kshara or Agni Karma	Diseased Tissue Destruction, Prevents Reoccurrence
Puyalasa	Dacryocystitis	Over the Vrana	Diseased Tissue Destruction, Prevents Reoccurrence
Abhisyanda	Conjunctivitis		Diseased Tissue Destruction, Prevents Reoccurrence
Adhimantha	Glaucoma	Above the Eyebrow	Pain Reduction
Lagana	Trachoma	Over the lesion	Diseased Tissue Destruction, Prevents Reoccurrence
Vartma arsha/arbuda	Ophthalmic sporidiosis, Tumour	Over the disease tissue	Diseased Tissue Destruction, Prevents Reoccurrence
Nili/ Linganasha	Cataract		
Bhru Vedana	Pain in eye brow	Apanga, Upanashika, Lalata	Pain Reduction
Netra Soola	Ocular pain	Apanga, Upanashika, Lalata	Pain Reduction

MUKHA ROGA			
DISEASE	DISEASE CORELATION	LOCATION OF AGNIKARMA	PURPOSE OF AGNIKARMA
Medoja Osth roga	Tumour of Lip	Over the disease tissue	Diseased Tissue Destruction, Prevents Reoccurrence
Jalarbuda	Mucocele	Over the diseased area	Diseased Tissue Destruction, Prevents Reoccurrence
Danta Nadi	Dental abscess	Over the disease area	Diseased Tissue Destruction, Rakta Srava Shamana
Krishna Danta	Dental discoloration	After tooth extraction over bleeding area	Diseased Tissue Destruction, Rakta Srava Shamana
Chala Danta	Mobile tooth, loose tooth	After tooth extraction over bleeding area	Diseased Tissue Destruction, Rakta Srava Shamana
Dalana	Fractured tooth	Over the diseased area	Reduce pain
Krimidanta	Dental carries	After tooth extraction over bleeding area	Diseased Tissue Destruction, Rakta Srava Shamana
Adhidanta	Coronitis	Over the diseased area	Reduce pain
Sheeta Danta	Tooth Sensitivity	Over the diseased area	Reduce pain
Danta vidradhi	Dental abscess	After tooth extraction over bleeding area	Diseased Tissue Destruction, Pain Reduction.

NASA ROGA			
DISEASE	DISEASE CORELATION	LOCATION OF AGNIKARMA	PURPOSE OF AGNIKARMA
Nasa-arsha	Nasal polyp	Over the diseased tissue	Diseased Tissue Destruction, Prevents Reoccurrence
Nasa-arbuda	Nasal neoplasm	Over the diseased tissue	Diseased Tissue Destruction, Prevents Reoccurrence

KARNA ROGA			
DISEASE	DISEASE CORELATION	LOCATION OF AGNIKARMA	PURPOSE OF AGNIKARMA
Karna arsha	Aural polyp	Over the diseased tissue	Diseased Tissue Destruction, Prevents Reoccurrence
Karna Arbuda	Aural neoplasm, Keloid	Over the diseased tissue	Diseased Tissue Destruction, Prevents Reoccurrence

KANTHA ROGA			
DISEASE	DISEASE CORELATION	LOCATION OF AGNIKARMA	PURPOSE OF AGNIKARMA
Galaganda	Goiter	After removal of the content, Over the diseased tissue	Diseased Tissue Destruction
Gandamala	Goiter	Over the diseased tissue	Diseased Tissue Destruction

DISCUSSION

4500 years ago, in the ancient era, *Ayurved* was the only treatment modality. Different health issues were treated with different *Oushadha-Kalpna*, *Panchakarma* and *Shalya chikitsa*. The *Shalya Chikitsa* includes *Yantra-Shastra*, *Kshyara* and *Agnikarma*. *Agnikarma* was used either as *Pradhana Karma* or as *Paschat Karma*. The main aim of the *Agnikarma* procedure are to reduce pain, achieve hemostasis, destroy the diseased tissue and to prevent reoccurrence of the disease. To achieve, Destruction of the *Vikruta Dhatu*, *Bedana Shamana*, to cease *Ati-Rakta-Srava* (coagulation), for prevention of reoccurrence (*Arsha*, *Arbuda* and *Granthi* etc.) *Agnikarma* can be used as *Pradhana Karma* or as *Paschat Karma* according to the need. After dental extraction, after *Chhedana* and *Vedana Karma*, to prevent reoccurrence and to reduce pain, *Agnikarma* can be used as *Paschat Karma*. *Agnikarma* is also can be used in chronic diseases like *Pillaroga (Puyalasa)* and chronic pain.

Recent Advancement

The father of modern health science, Hippocrates quoted that, “The diseases which medicines do not cure, iron cures; those which iron cannot cure, fire cures; and those which fire cannot cure, are to be reckoned wholly incurable” [51]. Therefore, there have been a great development in this direction. Cauterization is the developed state of *Agnikarma*. Now a days in the modern surgery Cauterization is used for coagulation and for tissue destruction. The Cauterization is the procedure of destroying the unhealthy tissue or clotting vessels to control bleeding by using heat, medicinal herbs and chemicals [52]. The Electro-cautery, Chemical-Cautery and Diathermy are the forms of cauterization.

Electro-cautery ^[53]

Electrocautery uses heat conduction from a metal probe heated to a high temperature by electrical current. This may be accomplished by direct current. This is usually used to achieve hemostasis in small vessels and to cut small tissues.

Electro surgery

Electrosurgery is used routinely to cut, coagulate, dissect, fulgurate, ablate, and shrink body tissue with high frequency (i.e. radiofrequency) electrical current. It involves using a high frequency electric current to cut tissue and coagulate bleeding. The flow of electricity requires a complete pathway (circuit). It may be Monopolar or Bipolar. In monopolar type, electrical energy flows from the generator (ESU unit), to the active electrode (cautery pencil) then passes through the patient to the dispersive cautery pad, thus completing the electrical circuit. The uses are Cut, Coagulate and Blend- produces cutting effect with hemostasis. Using a constant waveform, the surgeon is able to vaporize or cut tissue. This waveform produces heat very rapidly. The generator modify the waveform, so that the duty cycle (on time) is reduced. This interrupted waveform will produce less heat. Instead of tissue vaporization, a coagulum is produced. A “blended current” is not a mixture of both cutting and coagulation current rather a modification of the duty cycle. As we go from Blend 1 to Blend 3 the duty cycle is progressively reduced. A lower duty cycle produces less heat. Blend 1 is able to vaporize tissue with minimal hemostasis whereas Blend 3 is less effective at cutting but has maximum hemostasis. Bipolar electrosurgery uses 2-tined bipolar forceps. One tine of the forceps serves as the active electrode, and the other tine serves as the return electrode. The electrical current is confined to the tissue between the tines of the bipolar forceps. The grounding pad is not needed for bipolar cases. Often “electrocautery” is used to describe electrosurgery. This is incorrect. Electrocautery refers to direct current (electrons flowing in one direction) whereas electrosurgery uses alternating current. During electrocautery, current does not enter the patient’s body. Only the heated wire comes in contact with tissue but in electrosurgery, the patient is included in the circuit and current enters the patient’s body.

Chemical-Cautery:

Some chemicals are responsible for tissue destruction. So in this procedure a small amount of chemical is used to destroy the diseased tissue. There may be damage to surrounding normal tissue, resulting in pigmentation and scarring. Some of the examples are Silver nitrate, Trichloroacetic acid and Cantharidin. Silver nitrate is dipped into lunar caustic solution and pressed onto the lesion to be cauterized for a few seconds. Cantharidin is an extract of the blister beetle, which causes epidermal necrosis and blistering, usually used to treat warts.

Diathermy ^[54]

Electrosurgery is a common synonym used for Diathermy. However in other contexts/ diathermy means dielectric heating, produced by rotation of molecular dipolar in a high frequency electromagnetic field.

Mode of Action of Agnikarma (Flow chart No. 1)

In *Ayurved* the main purpose of *Agnikarma* are same as that of modern surgery. The common function are, *Bedana Shamana* (Reduction of Pain), *Rakta Sthambhana* (Coagulation), *Dahana Karma* (Diseased tissue destruction or Dissection and *Apoonarvaba* (prevention of reoccurrence).

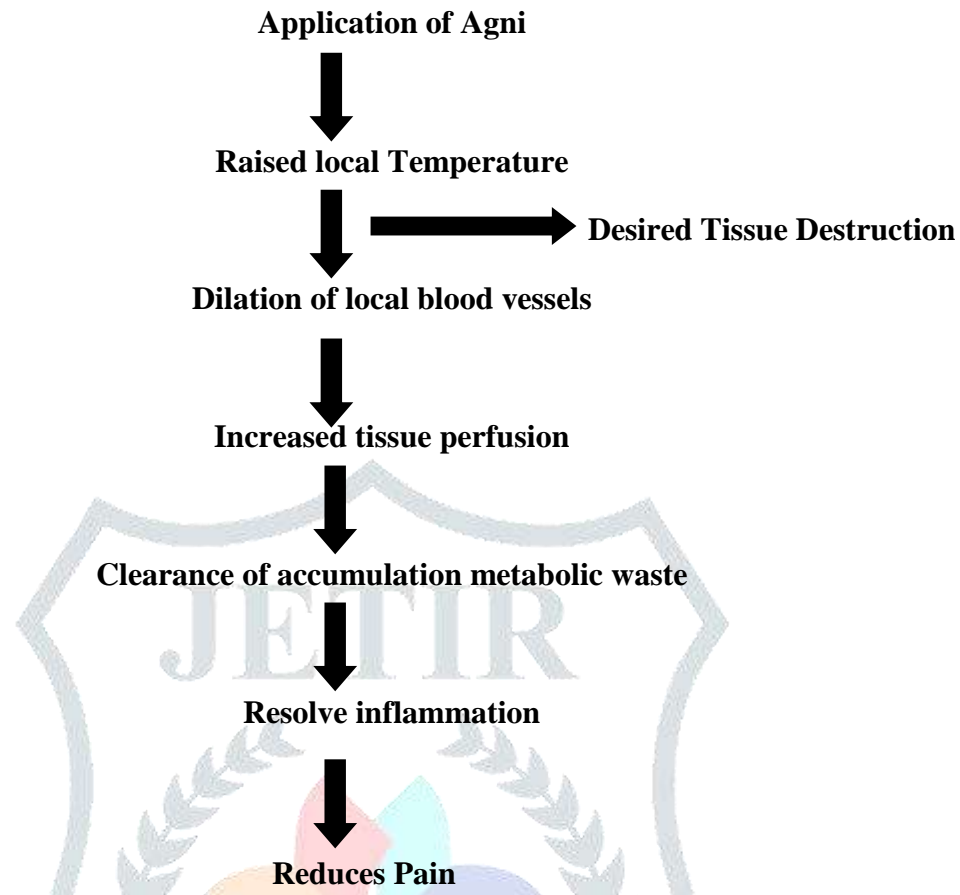
- ***Bedana Shamana (Reduction of Pain):*** Agni is *Ushna*, *Sukshma*, *Tikshna*, and *Ashukari*. It removes the *Srotavarodha*, and hence it maintains the equilibrium of *Vata*, *Kapha* and reduces pain. *Ushna* guna, increase *Dhatwagni*, so pacify *Ama*, which ultimately reduces pain. It increases the *Rasa*, *Rakta Sambahana* (blood circulation) in the affected site resulting in reducing pain.

- **Dahana Karma and Aponarvaba (Tissue Destruction and prevention of reoccurrence):** The *Ushna* and *Sukshma guna* of red-hot *Shalaka* destroy the diseased tissue from its root and all around the lesion. It destroys the dead or diseased tissue of *Nadi Vrana*, *dushta Vrana*, *Arbuda*, and *Bhagandara*. In *Nadi Vrana* the dead and diseased tissue are destroyed, the *Ushna* property improves circulations and promotes healing. It destroys the diseased tissue permanently so prevents reoccurrence.
- **Other benefits of Agnikarma:** Agni neutralize the *Vata* and *kapha* by its *Ushna*, *Tikshna*, and *Sukshma* property. The *Ushanguna* of *Agnikarma* causes *Utkleshnamtodhat*, which activates *Dhatwagni* causing *Ama Digestion* which ultimately responsible for *nirama Avastha* of the desired location. Thus pacifies *Vata* and *kapha*. *Agnikarma* induces *Sthambhana karma* in *Rakta Srava* ^[2].

Therapeutic effects of heat:

- The physiologic effects of temperature occur at the site of application of *Agnikarma*. Locally there is an increased blood flow with associated capillary dilation and increased capillary permeability. Initially tissue metabolism increases and there may be increase in the pain threshold and reduction of muscle spasm, Pain and Tenderness. The raised tissue temperature leads to vasodilation causing the increased tissue perfusion resulting clearance of local inflammatory mediators, which reduces inflammation and pain. Stimulation of DPI (Descending pain inhibiting mechanism) leads to Stimulation of CNS causing release of endogenous opioids in Proopiomelanocortin (POMC) cells in the arcuate nucleus & in the brainstem (e.g. Endomorphins, dynorphins etc.) thus Reducing pain. Vasodilation causing the increased tissue perfusion results in efficient oxygen delivery and it heals the tissue damage and injury caused by ischaemia and degenerations. The heat denatures the proteins and results in coagulation. The red-hot *Shalaka* or *Agnikarma* procedure burn the diseased tissue by its *Ushna* Property and it prevents reoccurrence by destroying the diseased tissue from its root.
- **Relation To Heat And Pain - Gate Control Theory Of Pain:** Heat stimulates the lateral spinothalamic tract and Stimulate the descending pain inhibitory mechanism, which Stimulate the CNS, thus Release of endogenous opioid peptide (in Proopiomelanocortin (POMC) cells in the arcuate nucleus and in the brainstem e.g. Endomorphins, dynorphins etc.), which Binds with opioid receptors at substantia gelatinosa. This inhibits release of p-substance by pre sympathetic inhibition and block the transmission of pain sensation.

Flow chart No. 1 showing Mode of Action of Agnikarma



Conclusion

Agnikarma is the base behind the recent advancement and developments of Cauterisation, electro cautery, Diathermy, radiation and LASER therapy. This treatment modality deals with the action of thermal energy over the human tissue in order to reduce pain, destroy unwanted or diseased tissue. This protocol was widely used as one of the parasurgical procedure of *Ayurved*. In the ancient India during the Vedic and Samhita period, the *Ayurved* scholars knew the concept of heat and its therapeutic uses over human body and even in the adnexa of eye. During those time, *Ayurved*-scholars established this *Agnikarma* treatment modality for coagulation, destruction of diseased tissue and for pain management of body and urdhwajatru gata roga. Though it is highly essential for surgical purpose, still we the *Ayurved* scholars failed to provide its place in surgery of *Ayurved* and we have failed to develop it like the modern surgery did. Therefore, we need to develop our ancient science of *Agnikarma* and to establish the new *Ayurvedic* protocol of *Agnikarma* in *Urdhwajatrugata roga* and for the *Shalya Chikitsa Upakrama*.

REFERENCES:-

1. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana. 12/3. P.50
2. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana.14/40.P.72
3. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana.1/10.P.5
4. Amarasimha-Amarakosha edited by A.A Ramanathan. Madras: published by Adyar library and research center; 1978.

5. Acharya Sushruta, Sushruta Samhita, Nibandha Sangraha Sutrasthana, Chapter 12, Shloka 2, Dalhana Teeka edited by Vaidya Yadavji Trikamji Acharya and Narayan Ram Acharya published by Chaukamba Surbharati Prakashan, Varanasi .Page no-50.
6. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Sutrasthana, 30/43-51. P.334
7. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana.12/16, p.53
8. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019-Sutrasthana, 40/3-7 P.258
9. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana.. 12/3-5, P. 51
10. Dr. Vrundasathe, sukhandachtaka: *Agnikarma chikitsa*, (1st edition), chapter no 8, Manakranika publication, Pune. P.47- 49
11. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana.12/9-13. P.52.
12. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana.14/40. P.72
13. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Sutrasthana, 12/16. P.52
14. Tripathy Brahmananda, Charaka-Samhita with Charaka- chandrika Hindi commentary Chaukhamba Surbharati Prakashan; Varanasi; 2009,*Chikitsasthan*, .25/106.P.858
15. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, .U.24/8-9, P. 1057 (Brahmananda Tripathy)
16. Tripathy Brahmananda, Charaka-Samhita with Charaka- chandrika Hindi commentary Chaukhamba Surbharati Prakashan; Varanasi; 2009, Sidhisthan. 9/77, P.1291 (Brahmananda Tripathy)
17. Thakral K.K, Sushruta Samhita with Dalhana Nibandha Sangraha and Gayadas Nyaya Chandrika, Hindi Commentary, Published by Chaukhambha Orientalia, Varanasi, Reprint 2017,SU.U.16/7, P.84, (Dalhana's Nibandha Sangraha Teeka).
18. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, .Uttara Tantra9/40-41. P.945
19. Sastri Laksmipati, Yogaratnakara with Vidyotini Hindi Commentary, Published by Chaukhambha Prakashan, Varanasi, reprint 2010, Uttara Tantra.*Netra.Pakhma Roga* 1, P.382
20. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra.12/3 P.229
21. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Uttara Tantra.14/5,P.67
22. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra12/11-13, P. 230
23. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, .Sutrasthana, 30/43 P. 334
24. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra12/22-24
25. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, Uttara Tantra.15/31, P.82 (Dalhana's Nibandha Sangraha Teeka).

26. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra16/59-60, P.997.
27. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra19/28, P.255
28. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra.16/21. P.992
29. Sastri Laksmipati, Yogaratnakara with Vidyotini Hindi Commentary, Published by Chaukhambha Prakashan, Varanasi, reprint 2010,.Uttarakhanda,.*Adhimantha roga chikitsa* 1, P. 391
30. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra.17/21-26, P. 250 Atridev Gupta
31. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, *Chikitsasthan*.6/6-7. P. 47.
32. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra.20/24-25, P. 1021.
33. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra24/35-39. P. 275.
34. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, *Chikitsasthan*18/38-40.P. 908
35. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra18/36-37, P.1009
36. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra22/9-11, , P. 1036
37. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra26/7-10,P.281
38. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, .*Chikitsasthan*.22/9, P.122
39. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra.22/34, P. 1039
40. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra.26/26. P.282
41. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, *Chikitsa* sthan. 22/23, P. 123,
42. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra22/16.P. 1037
43. Tripathy Brahmananda, Astanga Hridaya with Nirmala Hindi commentary Chaukhamba Sanskrit Pratishthan; Varanasi; 2017, Uttara Tantra.22/40-41, p.1040
44. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019.Uttara Tantra26/30. P. 283.
45. Sastri Laksmipati, Yogaratnakara with Vidyotini Hindi Commentary, Published by Chaukhambha Prakashan, Varanasi, reprint 2010,.Uttara Khanda, *MukhaRoga* adhikara *Dantamoola gata roga* 7, p.300.
46. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, *Chikitsasthan*.22/27. P. 123,
47. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019, Uttara Tantra26/16. P.282

48. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, *Chikitsasthan*.22/40, P. 125
49. Sashtri AmbikaDutta, Sushruta Samhita with *Ayurveda* Tattva Sandipika, Hindi commentary, Chaukhambha Sanskrit Sansthan; Varanasi; 2010, *Chikitsasthan*.18/53-55.P. 109
50. Gupta Atridev, Astang Sangraha with Hindi commentary, Published by Chowkhamba Krishnadas Academy, Varanasi, Reprint 2019. *Uttara Tantra*26/50.P.285
51. Hippocrates. Aphorisms. (Translated by Francis Adams. Adelaide: The University of Adelaide Library, 2014: section VII, 87.
52. Qureshi et al, Cautery Looked through the Lens of Clinical Perspective: Indications, Contraindications, Adverse Effects and Complications, *Journal of Advances in Medicine and Medical Research (JAMMR)*, 26(9): 1-16, 2018; Article no.JAMMR.42035.
53. Hainer BL, "Fundamentals of electrosurgery", *Journal of the American Board of Family Practice*, 4(6):419–26, 1991 Nov.–Dec.
54. GOOGLE scholar

