Rationality Behind Acharya Sushruta’s Approach Towards Therapeutic Agnikarma

ABSTRACT
Agnikarma is an important parasurgical measure extensively practiced in Ayurveda. It is a simple, ambulatory, minimal invasive and day care procedure. It can be utilized as a preventive, curative and haemostatic measure for systemic and surgical diseases. The common clinical conditions like External piles, Sentinel piles, Corn, Warts, Moles, Sciatica, Osteoarthritis, Frozen Shoulder and Calcaneum Spur can be treated effectively by Agnikarma. Agnikarma is considered as superior among anuashastra karmas and its mainly indicated in Ruja pradhana, Vata and Kapha vyadya.

Introduction:
The Ayurvedic surgery called Agnikarma is an important parasurgical measure extensively practiced in Ayurveda. It is a simple, ambulatory, minimal invasive and day care procedure. It can be utilized as a preventive, curative and haemostatic measure for systemic and surgical diseases. The common clinical conditions like External piles, Sentinel piles, Corn, Warts, Moles, Sciatica, Osteoarthritis, Frozen Shoulder and Calcaneum Spur can be treated effectively by Agnikarma. Agnikarma is considered as superior among anuashastra karmas and its mainly indicated in Ruja pradhana, Vata and Kapha vyadya.

For Agnikarma procedure various dahanopakaranas(devices) are mentioned they are Pippali(piper longum), Ajashakruttha (faecal matter of goat), Godanta(Teeth of cow ), Shara(Arrow ), Shalaka(Rod) for Twakdagdha(Skin burn), Jambaustra(A wick shaped instrument made up of stone), other metallic instruments for Mamsa dagdha(Muscle burn ), And kshoudra(Honey), guda(Jaggary ) and sneha(untous material) are used in the pain management of gambhir dhatu (deeper tissues)like sira(vessels), snayu(ligaments and tendons), sandhi(joints) and asthi(bones). But in day today practice commonly used Agnikarma instruments are Pancha Dhatu Shalaka, needles(suchi agnikarma) used for transferring the heat and different cautery probes of Thermal Cautery Machine for the purpose of Agnikarma irrespective of the structure involved or level of the pathology.

But concept of acharya Sushruta was to transfer heat from skin to deeper structures irrespective of Dhatu involved in the disease. Hence an attempt is made in this present study individual Dahanopakaranas were assessed for their thermal stability & the rationality of their specific indication.

Table no. 1 Materials and application of agnikarma in different parts.

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Level of dagdha</th>
<th>Materials used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Twak Dagdha(Skin Burn)</td>
<td>Pippali (piper longum), Ajashakruttha (faecal matter of goat), Godanta (Teeth of cow), Shara (Arrow), Shalaka (Rod)</td>
</tr>
<tr>
<td>2.</td>
<td>Mamsa dagdha(Muscle burn)</td>
<td>Jambaustra (A wick shaped instrument made up of stone), Suryakanta (A variety of semiprecious stone)</td>
</tr>
<tr>
<td>3.</td>
<td>Sira (vessels), Snayu (ligaments), asthi (bones), sandhi (joints)</td>
<td>Madhu (Honey), Guda (Jaggary), Sneha (Unctus materials), Madhuccista (Beewax), Suchi (needle)</td>
</tr>
<tr>
<td>4.</td>
<td>Kapha pradhana vyadhi</td>
<td>Ruksha dravya (dry substances)</td>
</tr>
<tr>
<td>5.</td>
<td>Vata pradhana vyadhi</td>
<td>Snigdha dravya (lubricant substances)</td>
</tr>
</tbody>
</table>

Dahanavisesa implies for the types of shape produced during Agnikarma chikitsa. Acharya Susruta has mentioned four types in contest of Agnikarmavidhi Adhyaya like Valaya (Circular shape), Bindu (Dot shape), Vilekha (Parallel line), Pratisarana (Rubbing). But Acharya Vagbhata - mentioned extra three varieties in...
addition to above those are, Ardhachandakar – Semilunar shape, Swastik, Ashtapada.  

CLASSIFICATION OF AGNIKARMA:
1 According to Dahanavisheha(Shape) :-
1. Valaya– At the site of disease, the agnikarma is performed in circular manner.
2. Bindu– The tip of the shalaka, which is heated to red-hot, is applied at the diseased site in the shape of dot.
3. Vilekha– Agnikarma is done by producing the lines of various shapes i.e. transverse or vertical etc. with red hot shara or shalaka.
4. Pratisarana– Agnikarma is performed by rubbing the affected part with red-hot shalaka.
5. Ardhachandrakruti– Agnikarma is performed in semi-circular shape over the affected area with the help of particular type of shalaka.
6. Swastika– Swastika shaped yantra can be used for the purpose.
7. Ashtapada– It is like making eight lines crossing each other at a single point with red-hot shara.

2 According to Dravyas used :-
- Snigdha Agnikarma: - Dravyas like ghrita, taila, vasa and maja are utilized and It is indicated in Sira, Snayu, Sandhi and Asthi vikara’s.
- Ruksha Agnikarma: - Dravyas like pippali, ajashakrit, shalaka etc. utilized and It is indicated in Twak and Mamsa vikara’s.

3. According to involvement of Dhatu: 
   8) Classification is done using a specific dahanopakarana in order to transfer the heat from twacha to the specified dhatu, the following are the lakshana are to be expected.

Twak Dhatu – When Agnikarma is applied to the Twakgata vikara it will give rise to Sabda pradurbhava (Appearance of sound).Durghandhata (foul smell), Twak sankocha (Concealment of smell) and pradurbhava.

Indications: Sira, Snayu, Asthi, Sandhi, and Majja are utilized and It is indicated in Sira, Snayu, Sandhi and Asthi, Jwara, Daha, Pipasa and painful joints.

Mamsa Dhatu – When Agnikarma is applied to the mamsa dhatugata vikara there is Kapota vartana (Color like pigeon),Alpa swayathu (Mild inflammation/swelling), Alpa vedana (Mild pain), Suska sankucita vranata (Contraction of skin)

Indications: Arsha, bhagandara, granti, nadivrana, dushtavrina, arbuda, gandamala

Sira & Snayu – When Agnikarma is applied to the Sira snayugata vikara there is Krsna vartana (Black discoloration),Unnata vranata (Raised wound), Srava sankochana (Constriction of blood vessels) and excessive burning sensation without production of Sphota.

Indications: Shlishtavartma, arsukravta, neeli and asamyak sira vyadhana, dantanadi, upapakshma, lagana

Asth, Sandhi – When Agnikarma is applied to the Asthi sandhigata vikara, the wound occurs with Ruksta (Dryness), Arunata (Dark reddishness), Karkasata (Roughness), Shhirata (firm wound).

Indication: Sandhi vedana, sandhi stabdata, Sandhivata, Sandhigata vrana, kunaka etc.

4. According to the Site :-
a. Sthanka dahanakarma:
Agnikarma is performed over the diseased area.
E.g. Bhagandara, arsha, , kadara etc.
b. Sthanantarka dahanakarma:
The agnikarma is indicated in the places other than the diseased area.e.g.
- Agnikarma is applied between the angushta of right side after incising the skin, in case of left sided antarvidhi and vice versa.
- agnikarma should be done at left manibandha sandhi-gata sira with tapt shara in case of pleehodara.

5. According To Stage of Intervention
Pradhana Karma: Arshankura (External Piles) that are Karkasha, Shthira, Pruthu and Kathina are burnt with Jambosha Shalaka.

Paschat Karma: Agnikarma is used after Chedanadhi Shastrakarma, to reduce the possibility of reoccurrence of disease. For e.g., Agnikarma is to be done after surgical excision of Kadara, Nadivrana and Bhagandara

PRAMADA DAGDHA (COMPLICATIONS) AND ITS MANAGEMENT
Plush & Dagdha –Insufficient burn results into Panduvarna and excessive burning sensation without production of Sphota. Plusha Dagdha is treated by Swedana and Ushnakriya containing of Ushna Aoushadha, Alepa, Annapan etc.

Durdagdha – Improperly applied Agnikarma will result into Sphota, Daha, Raga, Paka, Chosha for longer period, hence resulting into Durdagdhabhavana. Ushnakriya is applied for superficial tissue burns and Sheetakriya is applied for deep tissue burns.

Atidagdha (Deep Burn)– Excessive application of agni (heat) will cause Mamsavalambhana, Gatra Vishlesha, pain in Sira, Snayu, Sandhi and Asthi, Jwara, Daha, Pipasa and the wound heals after long time leaving behind the scar. Atidagdha is treated by removal of Vesheerna Mamsa and application of Tinduki Twak with ghee and cover the wound with Guduchi Patra and Padmotpala.

Suitable Season for Agni Karma*: Agnikarma may be performed in all the seasons except Sharada (summer) and Ghrita (winter) because in Sharad ritu there is pitta prakopa, Agnikarma also aggravates pitta and this may lead to prakopa of pitta. In emergency conditions it may be performed in these seasons preceded by precautionary measures.

Indications for Agnikarma*: Agnikarma is indicated in following conditions, Vata Vartana, Arsha (Haemorrhoids), Arbuda (Tumor), Bhagandara (Fistula-in-ano), Apaci (Lymphadenitis), Sleepada (Elephantiasis), Charmakila (Warts), Tilakalaka (Moles), Antravridhi (Hernia), Nadi (Sinus), Sonita Atipravrti (Excessive hemorrhage), Anklyos spondylitis, gridhrasi (Sciatica), Bursitis, Carpal Tunnel Syndrome, Fibromyalgia, Sprains & Strains, Sandhi-vata (Osteoarthritis), Plantar Fascitis, Tendonitis, Tennis El-
Contra indications for Agnikarma:\(^4\):

Agnikarma is contraindicated in following conditions, Pitta Prakriti, Bhinnakoshtha, Antanaita (Internal bleeding), Anudgruta Shalya (Impacted Foreign body), multiple Vrana, Balaka (Child), Vrudha (Old age), Bhinu (Fearful), Durbala (Weak), who is contraindicated for Swedana Karma and Kshara Karma.

Sites for Agnikarma:\(^7\):

- In Siro Roga and Adhimantra – At Bhru, Lalata and Sankha pradesha
- In Vartmagata roga – At Vartma romakupa, after covering the eye with moist cloth
- In Twcha, Mamsa, Sira, Snayu, Asthi, Sandhi – At the place of vedana.
- At the place of local disease e.g. Granthi, Arsha
- At the distant place like Antravidhi.

Procedure

Poorvakarma (Pre-operative procedure): The operation theatre should be fumigated with doopana/Krimighna drugs like Guggulu, Sarshapa etc. The Agnikarma materials – specific dahanapakarana, Gritakumari Swarasa, Triphala Kashaya and Yastimadhu Ghrita, madhu.

Selections of patient - All the patients were selected based on their clinical findings as well as relevant investigations. Written informed consent should be taken.

Advised to take Snigdha, Pichhila Aahara prior to this procedure for increase the strength of the patient and alleviate the Pitta Dosha and counter act Usna Guna of Agnikarma.

The stove or other source of Agni should be kept in the preparation room near the theatre and specific dahanapakarana should be heated to red hot.

Preparation of local part - Local part should be washed with Triphala Kashaya and wiped with dry sterilized gauze piece and draped.

Pradhanakarma: Dahana Karma is done at indicated site based on the pathology and Samyak Dagdha Lakshanas are observed. In general, the Sudagdhravarna will be having the features like production of sound during the procedure, proper haemostasis and wound exhibits Pakwa Tala Phalavarna or Kapotavarna.

Paschatkarma:

- After Agnikarma the part should be anointed with Madhu and Ghrita for Ropana of Dagdha Varna. This is meant for pacification of raktta and pitta vitiyated by Agnikarma and also for alleviation of pain.
- After that proper patta bandhan (bandage) should be done.

Table No. 4 Thermal Behaviour (Latent heat) of the Dhanopakarana

<table>
<thead>
<tr>
<th>Sl.no.</th>
<th>Materials</th>
<th>Average heating point</th>
<th>Immediate heat dissipation after removing from the fire</th>
<th>Subsequent heat dissipation/ min</th>
<th>Superficial tissue destruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pippali</td>
<td>55-60°C</td>
<td>10-12°C</td>
<td>20°C</td>
<td>Less</td>
</tr>
<tr>
<td>2</td>
<td>Ajashakruta</td>
<td>65-70°C</td>
<td>10-15°C</td>
<td>15°C</td>
<td>Less</td>
</tr>
<tr>
<td>3</td>
<td>Godanta</td>
<td>70-80°C</td>
<td>10-15°C</td>
<td>15°C</td>
<td>Less</td>
</tr>
<tr>
<td>4</td>
<td>Shara (Ar-row)</td>
<td>140-150°C</td>
<td>18-20°C</td>
<td>25°C</td>
<td>Less</td>
</tr>
<tr>
<td>5</td>
<td>Jambousta (stone)</td>
<td>215-220°C</td>
<td>20-22°C</td>
<td>8-10°C</td>
<td>Moderate</td>
</tr>
<tr>
<td>6</td>
<td>Panchaloha Shalaka</td>
<td>250-255°C</td>
<td>18-20°C</td>
<td>6-8°C</td>
<td>Moderate</td>
</tr>
<tr>
<td>7</td>
<td>Madhu</td>
<td>120-130°C</td>
<td>0°C</td>
<td>2-3°C</td>
<td>More</td>
</tr>
<tr>
<td>8</td>
<td>Guda</td>
<td>155-165°C</td>
<td>0°C</td>
<td>2-3°C</td>
<td>More</td>
</tr>
<tr>
<td>9</td>
<td>Tail</td>
<td>140-160°C</td>
<td>0°C</td>
<td>1-2°C</td>
<td>More</td>
</tr>
<tr>
<td>10</td>
<td>Ghrita</td>
<td>180-190°C</td>
<td>0°C</td>
<td>1-2°C</td>
<td>More</td>
</tr>
</tbody>
</table>

DISCUSSION

Effects of temperature change on the body tissues

The changes that occur in the living tissues on contact with heat are follows:\(^5\).

Effect on metabolic activity

The rate of any metabolic activity is increased by a rise in temperature (Vant Hoff’s law). In living organism increasing temperature tends to denature proteins and thus interfere with enzyme controlled metabolic processes. At temperatures above 450°C so much tissue destruction occurs. From the therapeutic point of view with an appropriate rise in temperature, all cell activity increases including cell motility and the synthesis and release of chemical mediators. Furthermore, the rate of cellular interactions, such as phagocytosis or growth, is accelerated.

Collagenous changes in the tissues

It has been shown that collagen melts at temperatures above 50°C. At temperatures within a therapeutic applicable range (40 – 45°C), extensibility of collagen tissue has been shown to increase. Therefore it becomes evident that joint stiffness reduces by heating.

Nerve stimulation

Heat and cold stimulate the sensory receptors of the skin since these sensations can be recognized. Afferent nerves stimulated by heat may have an analgesic effect by acting on the gate control mechanism.

Change in Blood vessel

With skin heating vasodilatation occurs not only to distribute the additional heat around the body, but also to protect the heated skin. The skin surface is naturally heated from the outside and heat conduction is not effected through the subcutaneous fatty tissue. Vasodilatation by heat is caused by several mechanisms. There will be a direct effect on capillaries, arterioles and venules, causing them all to dilate. Increased metabolism will lead to further
release of carbon dioxide and lactic acid, leading to greater acidity of the heated tissues, provokes dilatation. Heating can damage proteins; this may initiate an inflammatory response due to the liberation of histamine like substances and bradykinins which causes vasodilatation.  

**Effect on viscosity**

The resistance to flow in a blood vessel depends directly on the viscosity of the fluid and inversely on the fourth power of the radius of the vessel. Raising the temperature in liquids lowers its viscosity. Viscosity changes affect not only the fluids in narrow vessels (blood and lymph), but also a fluid movement within and throughout the tissue spaces. This increases the rate of circulation and thereby acts as anti-inflammatory in chronic lesion. Thus when heat is applied to the skin surface, little heating of the deeper tissues occurs because they are shielded by the thermal insulation provided by the subcutaneous fat and the fact that heat is removed in the increased skin blood flow. However, some conduction to the local deep tissues does occur. Since the effects are largely confined to the skin, for deeper conduction it is responsible to propose materials which are having more heat conduction capacity for longer periods. However, some conduction to the local deep tissues does occur. Eventually the heat penetration will always be higher of the tissue surface and also that of the subsequent layers. Eventually the heat penetration will always be higher of the tissue surface and also that of the subsequent layers.

Hence other modalities of Agnikarma such as suchi agnikarma i.e by pricking over the affected area and transferring heat and using one of Dahanopakaran for all types conditions is not indicated. To achieve desired Phalashruti one should follow the classical way of agnikarma as explained by Acharya Sushruta.

**CONCLUSION**

Agnikarma has been applied widely in the clinical practice since time immemorial. It is the best among the anushas-tra karma. Agnikarma with Dahanopakarana explained by acharya Sushruta which are having their own latent heat so selection of the dahanopakarana and type of agnikarma plays an important role in achieving good result.

The pippali ajashakrit, godanta, & shara are having less latent heat hence used for twak dagdhara, likewise Jambousta(A wick shaped instrument made up of stone), itherloha(other metallic instruments)-panchalahala Shalaka are having moderate latent heat hence used for mamsadtra karma. Agnikarma with Dahanopakarana explained by Acharya Sushruta which are having their own latent heat so selection of the dahanopakarana and type of agnikarma plays an important role in achieving good result.