

USE OF ESSENTIAL ANALOGIES IN KALA SHAREERA

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ABSTRACT

For better understanding in complex areas of anatomy, students can use essential analogies. Concepts such as peritoneum, pleura, fascia, membrane etc. can be studied by comparing with similar objects or materials. In such cases, the analogies if used appropriately, shall aid students to study and remember the concepts easily. In *Kala shareera* its application is widely seen throughout the chapter. Here *Upamanas* were used based on their structure and location so as to clarify and support a particular context as a subject of study. In present paper, an attempt has been made to explain concepts of *Kala shareera* with the help of analogies.

KEYWORDS: *Kala shareera, Upamana pramana, Anatomical terminology.*

INTRODUCTION

The knowledge of *Kala shareera* is important for BAMS students in order to understand the structural and functional layers (membranes) of the body. It is very difficult to understand the concept of *Kala* as the description of *Kala* is very minimal. Here with the help of analogy the subject matter becomes easy. *Acharya Sushruta* had used the terminology which was prevalent at the time based on physical appearance, measurement, or quantity and has aptly given examples wherever it gets difficult to visualize concepts mentally. The sequence of structures have been described appropriately, with the first one being the external layer, i.e., *Twak* (skin) then *Kala* (membranes), and so on. The usage of *Upamana Pramana* can be seen more in the description of *Kala shareera*.

According to *Acharya Vagbhata*, the *Kleda* that exists between the *Dhatu* and its *Ashaya* undergoes *Pachana* by the heat of body and

transforms itself into *Kala*, further the *Snayu* and *Shleshma* are said to be its components which are spread in its layers and finally the essence part of *Dhatu* is what remains as *Kala*.^[1]

According to *Acharya Sushruta*, *Kala* are said to be seven in number for certain (*Khalwapi*) and exist as a separator or boundary (*Maryada* or *Seema*) between the *Dhatu* and its *Ashaya*;^[2] they are *Mamsa, Raktha, Meda, Shleshma, Purisha, Pitta* and *Shukra*. Using *Upamana pramana* he goes on to tell that, how the branch of a tree is cut and when the outer layers are removed, we see the inner layers (annual rings) beneath it (*Sara*), the same way outer covering of *Mamsa Dhatu* has to be cut (*Chedana*) in order to see the inner layer of *Kala*.^[3]

These *Kala* are said to be extensively covered (*Pratichanna*) with *Snayus*, enclosed and encased (*Veshtitha*) by mucosal layer (*Shleshma*). Author compares this to the way

in which the foetus is completely covered by an amniotic sac (*Jarayu*).^[4] The amniotic layer is thin but at the same time is strong enough to give necessary protection to the foetus. He says in *Sankhya Shareera* that *Snayus* are fibrous tissues which have the capacity to withstand pressure and carry weight (*Bharakshama*)^[5], thus we can conclude that *Kalas* have a weight bearing nature. Since there is an encasement of *Shleshma* on the *Kala* we can say that it has a secretive nature too, where it has mucus like unctuous layer on it.

APPLICATION OF UPAMANA PRAMANA IN KALA SHAREERA

KALA SWAROOPA

When the wood or stem is cut, some liquid flows out of it. This can be considered as the essence or *saara* of the wood or stem (*Sanjni*). Similarly, when a muscle is cut, we can see the tissues through it or ooze through it in the form of *Rasa* and *Rakta* (*Sanjnaa*).^[6]

	
<p>MAAMSA AND DHATU BODY SITE: SOLE</p>	<p>VRUKSHA AND SAARA PLANT NAME: <i>Hevea brasiliensis</i></p>

MAMSADHARA KALA

Veins, capillaries, etc., situated in the flesh, grow and ramify just as the roots and stems of a lotus plant situated in the mud water do i.e., they concurrently grow and expand.^[7]

	
<p>MAAMSE SIRAADAYA</p>	<p>BISA MRUNAALA PLANT NAME: <i>Nelumbo nucifera</i></p>

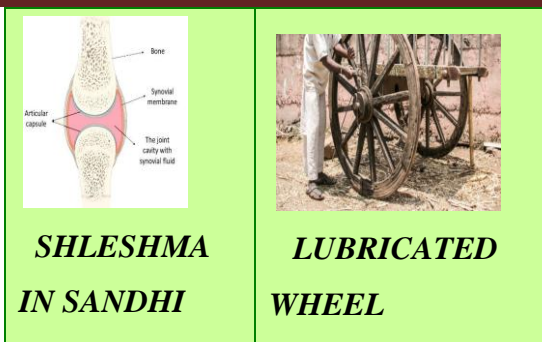
RAKTADHARA KALA

Blood oozes out instantaneously on the flesh of the body (supplied with the *Raktadhara-kala*) on being wounded just as a plant containing latex in its tissues, when wounded or pricked, exudes milky juice.^[8]

	
<p>RAKTADHARA</p>	<p>VRUKSHA KSHEERA PLANT NAME: <i>Pterocarpus angolensis</i></p>

SHLESHMADHARA KALA

According to *Acharya Sushrutha*, the fourth kala is *Shleshmadhara kala*, located in all the joints and is vital. Just as a properly lubricated part of a frictional area of a wheel helps for good quality motion, the same way the *Shleshma* present in *Sandhis* facilitate for their proper functioning.^[9]



**SHLESHMA
IN SANDHI**

**LUBRICATED
WHEEL**

SHUKRADHARA KALA

In *Sushruta Samhitha* it is mentioned that the seventh *Kala* is the *Shukradhara kala*, which is spread in all living beings throughout their bodies like ghee in the milk and jaggery in sugarcane, thus the presence of *Shukra* is prevalent throughout the human body. [10]

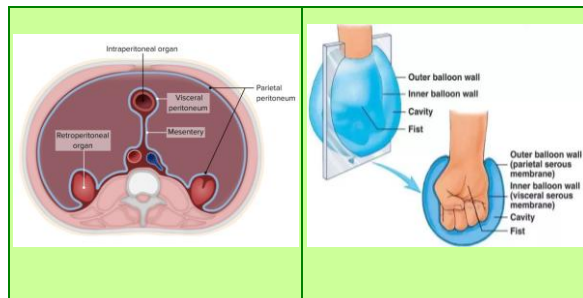
<p>TESTOSTERONE & BODY GROWTH</p>	<p>JAGGERY IN SUGARCANE</p>
<p>TESTOSTERONE & CELLULAR REPRODUCTION</p>	<p>GHEE IN MILK</p>

DISCUSSION

Ayurveda has formulated quite a number of original theories, which have stood still as a

paramount in the field of medicine since thousands of years. Now briefing on the relationship between *Kala* and contemporary science the term *Kala* can be understood as the various serous or mucosal membranes present in the human body.

The various membranes of the body such as pleura that covers the lungs, pericardium which covers the heart and peritoneum that covers the abdominal viscera all exist as serous layers between the respective organs and body cavities and carry out the function of providing proper support, protection and lubrication. *Kala* also carries out the same function in the body and hence can be correlated to the above structures.



Mamsadhara kala includes the innermost layer of skin i.e., dermis (*Mamsadhara-twacha*), superficial and deep fascia intermuscular septum, epimysium, perimysium, and endomysium. The *Raktadhara kala* allows blood to flow through various blood vessels, capillary network, and sinusoids in the liver and spleen. The tunica intima of blood vessels can be considered *Raktadhara kala*. *Medodhatu* is present over the entire body especially it is appreciated in the region of abdomen in the form of omentum, mesentery, and mesocolon. It can also be correlated with the endosteum of the bones. Similarly the *Shleshmadhara kala* can be correlated with synovial fluid and membrane of the joints. *Purishadhara kala* can be correlated with mucosal membrane of the gastro-intestinal tract especially in the region of large intestine. The *Pittadhara kala* can be correlated with the epithelium of digestive glands, enzymes, mucous membrane of the

digestive tube, its villi, and lacteals responsible for digestion. *Shukradhara kala* can be correlated with the inner lining of the seminal vesicle, ejaculatory duct, vas deferens, epididymis, and seminiferous tubule in the testis.

Since now we have an understanding about the concept of *Kala shareera*, and the way in which *Upamana pramana* were used by the *Acharyas* to describe the other *Kalas*, we can give some of our own comparisons for the better understanding of those *Kalas* which were not given any *Upamanas* for their description.

A] MEDODHARA KALA:

According to *Acharya Sushruta* this is the third *Kala* which is present in the region of abdomen (*Udara*), small bones (*Anu asthi*; as *Sarakta meda*) and in long bones (*Sthulasthi*; as *Majja*).^[11] We can easily understand this by taking the example of coconut and the white pulp present inside it, the same way *Meda* exists within the bones and in the region of *Udara* below layers of *Twacha* and *Mamsa*.

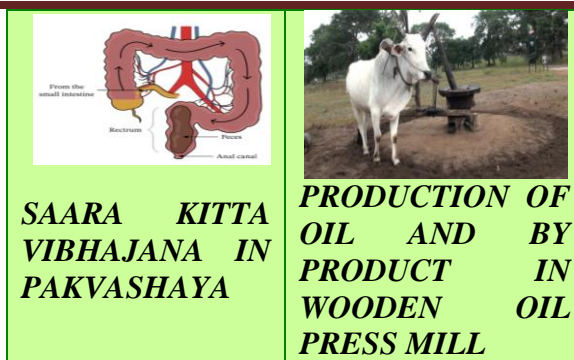


BONE MARROW

WHITE PULP OF Cocos nucifera

B] PURISHADHARA KALA:

This is the fifth *Kala* present inside the *Pakvashaya* and which does the function of separation of Mala from the food material after its digestion i.e., basically it carries out the *Sara – kitta Vibhajana karma* on the consumed *Aahara*.^[12] This concept can be made easily understood by comparing it to the process of oil production by a wood press oil mill, where for instance groundnut seeds are crushed to give out oil on one end and also the waste on the other end, similar to production of *Sara* and *Kitta* from *Aahara*, respectively.



SAARA KITA VIBHAJANA IN PAKVASHAYA

PRODUCTION OF OIL AND BY PRODUCT IN WOODEN OIL PRESS MILL

C] PITTADHARA KALA:

This *Kala* being the sixth one is said to support the four types of foods in *Koshta* which further undergoes digestion (*Jeeryathi*) and in due course of time gets absorbed (*Shoshitham*) by the heat of *Pitta*.^[13] This process can be understood better by using the *Upamana* of *Homa*, in which various offerings put into the sacrificial altar along with *Ghrta* gets burnt into ashes by the *Agni* in the altar i.e., the *Tejas* does the *Shoshana* of all the substances put into it.



AGNI IN HUMAN

AGNI IN HOMA

CONCLUSION

For better learning and meaningful understanding, students may relate the complex areas in a subject with familiar structures. Use of analogies may help the students to remember and understand the core concept of curriculum, stimulate ones' interest and also in developing meaningful thoughts

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