



KALA SHARIR – TESTIMONY INSIGHT FROM AYURVEDA

Ravindra Dhindhime¹, Tawalare Kiran*² and Tawalare Kalpana³

¹Professor, Department of Kriya *Sharir*, Govt. Ayurved College, Osmanabad.

²Asst. Professor, Department of Kriya *Sharir*, Shri Ayurved College, Nagpur.

³Asso. Professor, Department of Rachana *Sharir*, Govt. Ayurved College, Nagpur.

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***Corresponding Author**

Dr. Tawalare Kiran

Asst. Professor,

Department of Kriya

Sharir, Shri Ayurved

College, Nagpur.

drkirantawalare@gmail.com

ABSTRACT

Describing the seven layers of *kala* (membrane, sheaths, septa) shows keen observation of Sushruta. *Kala* can be defined as membranous structure present inside the *dhatu*s (tissue) and *ashaya*s (hallow organ). Critical study of all Ayurveda text shows explanation *kala sharir* is firsthand experience of *acharya*. As per modern science membranes are formed during embryonic period from 3 primary tissues epithelial,

connective tissue and adipose tissue this shows similarities in the *kala* as *snayupratichanna* (covered from ligament), *santata jarayu* (foetal covering) and *shleshmanavestita* (coated with *kapha*).

KEYWORDS: *kala* (membrane, sheaths, septa), *snayupratichanna*, *santata jarayu*.

INTRODUCTION

Now a day's scholars of Ayurveda, agree to identify '*kala sharir*' generally as membranous structure of body. There are seven layers of '*kala*' present inside the *dhatu*s and *ashaya*.^[1] Among these first is *masadhara* which is present inside the muscles, and which allows the *siras* (veins), *snayu* (ligament) and *dhamani* (arteries) to spread their branches inside the muscles.^[2] Second *kala* is *raktadhara kala*, present inside the muscles, within which *shonita* (blood) is present, especially in *siras* (veins) localized in *yakrut* (liver) and *pliha* (spleen).^[3] The third is *medodhara kala*. *Meda* (fat) is present in the abdomen and small bones of all living beings.^[4] The forth is *shleshdhara kala* present in all joints of bones and supporting its life functions.^[5] The fifth is *purishdhara kala*, which present inside *pakvashaya* (large

intestine) separates the mala (waste products, stool especially) from the food material after its digestion. Situated inside the alimentary tract, commencing from *yakrut* (liver) and the intestine, this *maladhara kala* separates the mala (*faeces*) at the *unduka* (caecum).^[6] Sixth is *pittadhara kala*, which supports (retains) the four kinds of food and drinks, pushed out from the *amashaya* (stomach) and staying in the *pakvashaya* (small and large intestine).^[7] Seven is *sikradhara kala* which pervades the entire body in all living beings.^[8]

Aacharya Dhalhan described the *asthidhara kala* and *majjadhara kala*. He explains *asthidhara kala* as *purishdhara kala* and *majjadhara kala* as *pittadhara kala*.^[9] Aacharya Sharangadhar explains 7 layers of *kala*. *Mansadhara kala* (muscles), *Asrukdhara kala* (blood), *medodhara kala* (fat), *yakrutplihadhara kala* (liver spleen), *antradhara kala* (intestines) *agnidhara kala* (duodenum) and seventh is *retodhara kala* (seminal tract) respectively.^[10] As per functional aspect, *snayupratichanna*, *santata jarayu*, *shleshmala vestita* are three basic variety of *kala*. Present day Ayurveda scholars consider the *kala* as membranous part of the body but not unanimous in correct form named above. Through this review article authors wants to explain *kala* according to Ayurveda text in relation with modern science.

AIMS AND OBJECTIVES

- To explain experienced firsthand an account of *kala sharir* in view of *kala sharir*.
- To explain unanimous correct form of *kala* according to modern science.

MATERIAL AND METHODS

Classical texts of Ayurveda viz. *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Sangrah* and *Ashtanga Hridaya* were consulted as research references, to know the line of treatment in ancient system Ayurveda. Evidence based resources as journals, books, and data based information from various search engines were referred for recent information. Critical analysis of available literature was done.

DISCUSSION

Modern view of *Kala*

Membrane are formed, during the embryonic period itself, mainly from three kinds of primary tissues – epithelial, connective and adipose.^[11]

1. **Epithelial tissue** – makes for two kinds of secreting membrane viz, mucous and serous; the former secretes thick jelly like fluid i.e. mucus and are inside all hollow organs of digestive, respiratory, circulatory, urinary and reproductive system, Serous membranes

secretes thin watery fluid and are present enveloping certain organs (heart, lungs, testes etc.)

2. **Connective tissue** – Membranes formed from this are of different shapes – long, cylindrical, flat etc and go into the formation of fascia, aponeurosis, septa, ligaments, tendons, cartilages etc; some of these are inelastic, some moderately elastic and some greatly elastic. These are found in the skin, walls of organs of digestive, circulatory, urinary, muscular and haemopoietic systems.
3. **Adipose tissue** (fat) is a storage tissue. It forms membranes or layers – thin or thick in various places. It is present in the subcutaneous tissue, bone marrow, abdominal wall, omentum, forms padding around some organs like kidneys, eyeball etc. With the help of above facts, three kinds of *kala* may be corrected as follows.
 - i. *Snayu pratichanna kala* – membranes of connective tissues such as fascia, apponeurosis, ligaments, tendons, external layer of wall of organ of digestive, respiratory, circulatory, urinary, reproductive systems etc.
 - ii. *Jarayu santata kala* – membranes formed from fibrous connective tissue making for superficial and deep fascia forming part of muscles etc., separating them into functional units or even uniting the parts together, these also form body cavities etc.
 - iii. *Shleshma veshtita kala* - membranes formed from fibrous epithelial tissues, which secrete fluids; these are two, viz – mucous membrane and serous membranes.

The seven *kala* can be correlated with the as following manner

1. *Mansadhara kala* – connective tissue layer inside muscle such as, intramuscular septa, aponeurosis, ligaments etc. This is *snayupratichanna kala*.
2. *Raktadhara kala* – thin mucous membrane inside arteries, veins, liver and spleen, formed epithelial tissue. This is *shleshmadhara kala*.
3. *Medodhara kala* – membranes composed of adipose tissue (fat) such as subcutaneous fascia, omentum etc.
4. *Shleshmadhara kala* – Synovial membranes present in joint of bones, it is serous membrane formed from epithelial tissue. It is *shleshmavestita kala*.
5. *Purishdhara kala* – mucous membranes present inside the large intestine formed from epithelial tissue. It is *shleshmavestita kala*.
6. *Pittadhara kala* – mucous membranes present inside the stomach, duodenum and small intestines. It is also *shleshmavestita kala*.

7. *Sukradhara kala* – is the mucous membranes of the testes, semeniferous tubules. Epididymus, vas deferens and prostate and prostate in the male and vagina, uterus, uterine tubes and ovaries in female; this is also *shleshmavestita kala*.

Rather than this seven *kala*, Acharya Sushruta has described other *kala* on different places.

1. *Mastulungavarana* – Covering over the brain known as membranes. It consists of three layers – duramater (outer) arachnoid (middle) and piamater (inner). Duramater is thick made up of strong collagenous fibres of connective tissue and the other two are thin, and have this fluid CSF between them. When this fluid increases in quantity it produces the disease known as hydrocephalus. This covering may be taken as *snayu pratichanna* as well as *shleshmavestita kala*.
2. *Puppasavarana* – Covering over the lungs known as plura, formed from elastic serous membrane. It has two layers – parietal (outer) and visceral (inner). Between these a little quantity of serous fluid is present. Decrease or increase of this fluid produces the disease called pluresy. This may be taken as *shleshmavestita kala*.
3. *Hrudayavarana* - Covering over the heart known as pericardium, has two layers – fibrous (outer) and serous (inner). Outer layer is made up of strong fibrous tissue. This may be taken as *snayupratichanna kala*.
4. *Asthyavarana* - Covering over the bone known as periosteum, made up of dense fibrous tissue. This may be called as *ashtidhara kala* and as *snayupratichanna kala*. Inside the bone, lining its cavity there is a thin layer known as endosteum which separates the bone cells and bone marrow. It produces both blood cells and bone cells, and is slimy due to marrow adhering to it. This layer may be called *majjadhara kala* and *shlemaveshthita* variety.
5. *Udaravarana* – covering immediately underneath the abdominal wall known as peritoneum. It is a sac of two membrane having two layers – parietal and visceral. It is a serous membrane and small quantity of fluid is present between these layers. Increase of this fluid gives rise to the disease known as ascitis. This may be taken as *shlemaveshthita kala*.
6. *Vrushananarana* – covering over the testes known as tunica vaginalis. It also has two layers – parietal and visceral. It is a serous membrane and little quantity of fluid is present in between these layers. Increase of this fluid gives rise to the disease called hydrocele. This may be considered as *shlemaveshthita kala*.

KALA INSIGHT OF AYURVEDA

Purishdhara Kala known as Asthidhara Kala - *Purishdhara Kala* is the fifth *Kala* described by *Acharyas* in Ayurved. *Acharya Sushruta* said that, *Malavibhajan* (separations of nutrients and formation of mala) occurs within the *kostha* (gastro intestinal system) which contains *pakwashaya* (large intestine). This *kala* is present in the *aantra* which is near and around the *yakrut* (liver) and in the *kostha*. *Unduk* is that place or the organ where *malavibhajan* begins, function of *kala* is to separate *dhatu* and *ashaya*, in *pakwashaya*. Separation of stool and urine also take place at large intestine. From above statements of *Sushruta*, it can be understood as *maladhara* or the *purishdhara kala* is situated in large intestine (*pakwashaya*), which begins from *unduk* in the *koshta*. *Asthidhara kala* is not included under the *sapta kala* of the *Acharyas*, but *Acharya Dalhana* had considered this *asthidhara kala* to be same as *purishdhara kala*. Here a question arises, that why *Dalhana* has considered *Purishdhara kala* as *asthidhara kala*? Why he has not considered *asthidhara kala* as a separate *kala* from *purishdhara kala*? An attempt is made to try to solve these questions as; *asthi dhatu* is the fifth amongst seven *dhatu*s. As per *Acharya Sushruta*, *visha vega* are seven because, they take the *ashraya* of these seven *kala* for appropriate period and exhibits the symptoms accordingly.^[12] In the fifth *vish vega*, there is *parwabhedha*, so when the poison is in its fifth stage, i.e., when it is in the *purishdhara kala*, it exhibits symptoms related with *asthi dhatu*. In Ayurveda, *basti* is given via rectal route, so this way *basti* nourishes the *asthivaha strotas* and thereby treats *vataj vikaras* including *asthi dhatu kshaya*. In Ayurved, *Acharyas Kashyap* has explained about the disease *fakka* (rickets) in children. In this disease the child is unable to stand even after completing a year. *Karshya* is the main symptom seen in this disease. In modern science rickets is the disease where there is decreased absorption of calcium and phosphorus from the intestine, leading to bending and softening of the long bones. Large intestine contains large number of Ca-Na ion channels, which take up calcium from the extra cellular fluid. From above all discussions, the term *asthidhara kala* appropriately suits to *purishdhara kala*.

PITTADHARA KALA KNOWN AS MAJJADHARA KALA

Acharya Dalhan said in *Kalpa Sthana*, *pittadhara kala* is also known as *majjadhara kala*.^[13] According to sequence of *dhatuposhan nyaya*, main site of *pittadhara kala* is *grahani* and main site of *majjadhara kala* in *asthi*. According to Ayurveda formation of blood occur in liver, spleen, *anvasthi* (small bone). *Pitta* is generated as a *mala* at the time of blood

formation. Hence aacharya dalhan may established the relation between *pittadhara kala and majjadhara kala*.

CONCLUSION

Keen observation of *Sushruta* defines the seven layers of *kala*, which can compare different types of tissue forms the various structures embryologically.

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