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Critical study of *Kala Shareera w.s.r. to Pittadhara Kala* with its Modern Anatomy

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ABSTRACT

In various classical texts of *Ayurveda*, *Kala* is described as an anatomical structure, which separates the *Dhatu* and *Aashaya* i.e., it provides boundary between *Dhatu* and *Aashaya*. Also called as *Dhatwashyantaramaryada*. As per *Acharya Sushruta*, the numbers of *Kala* are Seven. *Acharya Sushruta* said as the core of a piece of wood become exposed to view by cutting into it, so the *Dhatu*s of the body may be seen by removing the successive layers. These *Kala* are extensively supplied with *Snayus*, bathed in mucus and encased in membranous covering. By sequential order, *Pittadhara Kala* is the sixth *Kala* mentioned by *Acharya Sushruta*. According to modern anatomy the mucus membrane presents many villi, the intestinal villi are finger like projection of mucous membrane. They give the surface of the intestinal mucosa a velvety appearance. Each villus is covered by a layer of absorptive columnar cells. This article lays emphasis on the types of *Kala* according to *Ayurvedic* perspective w.s.r. to *Pittadhara Kala* and its correlation with modern anatomy. This article describes the various aspects of *Kala* mainly *Pittadhara Kala* in all respects to types, structure etc. Since description of *Kala* and its types is present in both the sciences, so an attempt is made in this article to correlate and compare *Kala* with Membrane.

Key words: *Aashaya, Dhatu, Kala, Membrane, Pittadhara Kala.*

INTRODUCTION

The meaning of the *Kala* is the boundary which separates *Dhatu* and *Aashaya*. In the fourth chapter of *Shareera Sthana*, *Acharya Sushruta* has described definition of *Kala* and the nature of *Kala*. The number of *Kala* are seven and are situated at the extreme

borders of the different *Dhatu*s.^[1] *Acharya Sushruta* said as the core of a piece of wood become exposed to view by cutting into it, so the *Dhatu*s of the body may be seen by removing the successive layers.^[2] These *Kala* are extensively supplied with *Snayus*, bathed in mucus and encased in membranous covering.^[3] As per *Ashtanga Sangraha*, the moisture that remains inside the space in the *Dhatu*s get cooked by the heat present in them, forms into structure similar to which found in the wood and become covered with *Snayu, Shleshma* and *Jarayu*. It is called as *Kala* because it is formed from very little quantity of *Rasa* and absence of *Dhatu*s. These are seven and found inside the *Dhatu*s.^[4] There are Seven *Kala* in human body whereas *Pittadhara Kala*^[5] is sixth one and is present in between *Pakwashaya* and *Amashaya* i.e. *Grahani*. *Grahani* has utmost importance in *Agni*, *Agni* has role in causation of every disease.^[6] *Grahani* also promotes complete digestion, assimilation and absorption with the help of

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Pachak Pitta which is produced by *Pittadhara Kala*. It holds the four kinds of food i.e., *Aashita, Khadita, Peeta, Lidha*^[7] in the *Pitta Sthana*, propelled from the stomach and on its way to the intestine. *Grahani* can also be correlated with the small intestine and which is present in between stomach and large intestine and is the major site of digestion and absorption of all nutritive substances, vitamins, micronutrients into the peripheral blood circulation.

According to modern view, *Kala* is in the form of membrane, Fascia, Septum. The mucus membrane presents many villi. The lamina propria of mucosa presents plenty of intestinal glands (Crypts of lieberkuhn). The muscular mucosa is responsible for local contraction of the mucus membrane.^[8] If we see the nature of *Mahasrotas* i.e., gastrointestinal tract, it is found to be made up of four layers -

1. Mucous layer
2. Sub-mucous layer
3. Muscular layer
4. Serous or fibrous layer.

The nature of *Mahasrotas* i.e., G.I. tract according to modern view and the nature of *Pittadhara Kala* described by *Acharya Sushruta* both are similar, hence to study *Pittadhara Kala* can be attributed with the clinical knowledge for gastro-intestinal tract. *Grahani* described by *Acharya Charaka* can be considered to be the same organ which is described as *Pittadhara Kala* by *Acharya Sushruta*.

AIMS AND OBJECTIVES

1. To study the concept of *Kala Shareera*.
2. To study the concept of *Pittadhara Kala*.
3. To study the clinical aspects of anatomical structures involved in *Kala Shareera* and *Pittadhara Kala*.

MATERIALS AND METHODS

a) *Bruhatrayee (Charaka Samhita, Sushruta Samhita, Astanga Hrudaya, Ashtanga Sangraha)* along with their commentaries by different Authors will be referred for the study.

b) Modern Textbook of Anatomy eg. Anatomy Book of BD Chourasia, A Concise Textbook of Surgery by Dr.K. Das, Grant's Atlas of Anatomy, Dr. Williams, Dr.Warwick Churchill, Cunningham's Manual of Practical Anatomy & Dissection.

c) Published article in international or national journals, Internet, PubMed etc.

Methodology

a) Literary data regarding *Kala Shareera* has been collected from *Brihatrayee, Laghutrayee* and other classical texts including journals, presented papers, and text books of contemporary science.

b) While studying about *Kala* through *Sushruta Samhita* the commentaries of different authors and some texts will be critically studied to interpret the concept about *Kala*.

REVIEW OF LITERATURE

In *Ayurveda*, there are seven numbers of *Kala* are mentioned. Out of these *Pittadhara Kala* is the sixth one mentioned. *Pittadhara Kala* is located in between *Amashaya* and *Pakwashaya*. Being the abode of internal fire (digestive activity), It withholds by force, the movement of food material passing from the *Amashaya* (Stomach) into the *Pakwashaya*. Digests the food by the heat of *Pitta*, absorbs it and allows the digested food to move further, under the influence of decreased activity of the *Doshas* present therein. It allows even undigested food to move further. Hence this is also known as *Grahani*, in view of its function of holding the food. Its strength is from *Pitta* itself known as *Agni*. This activated by fire, it maintains the welfare of the body.^[9]

There are seven *Kala* described by *Acharyas*, they are as follow^[10]

1. *Mamsadhara Kala* involves *Sira, Snayu, Dhamani, Srotas*
2. *Raktadhara Kala* involves *Sira* of *Yakruta* and *Pleeha*
3. *Medodhara Kala* involves Abdomen and Small bones

4. *Shleshmadhara Kala* involves all Joints
5. *Purishdhara Kala* involves *Pakwashaya*
6. *Pittadhara Kala* involves Stomach and Intestine
7. *Shukradhara Kala* is *Sarva Shareera Vyapini*

As per *Acharya Sharangadhara*, there are seven *Kala* mentioned as^[11]

1. *Mamsa*
2. *Asruka (Rakta)*
3. *Meda*
4. *Yakruta* and *Pleeha*
5. *Antra*
6. *Pitta*
7. *Shukra (Retas)*

In the modern terminology, *Kala* is in the form of membrane.

Anatomically, it may be considered as

Snayaviya - Fibrous membrane

Jarayuja - Serous membrane

Shleshmal - Mucus membrane

The seven *Kala* can be correlated with following structure described in modern anatomy:

1. *Mamsadhara Kala* : Deep fascia, intermuscular septa
2. *Raktadhara Kala* : Endothelial lining of the blood vessels and sinus in the liver and spleen
3. *Medodhara Kala* : Omentum, deep fascia
4. *Shleshmadhara Kala* : Synovial membrane
5. *Purishdhara Kala* : Mucus membrane of colon and rectum
6. *Pittadhara Kala* : Mucus membrane of small intestine
7. *Shukradhara Kala* : Mucus membrane of the vasa deferentia, vas deferens.

DISCUSSION

Kala is the boundary which separates the *Dhatu* and *Aashaya*. There are various types of *Kala* mentioned in Ayurvedic texts. There are seven number of *Kala* are mentioned, out of these *Pittadhara Kala* is the sixth *Kala* mentioned. Any deformity or disorder may affect the normal functioning of *Kala*. Description of *Kala* in ancient *Ayurvedic* texts have very much similarity between these two regarding types and composition.

CONCLUSION

This study of *Kala Shareera w.s.r. to Pittadhara Kala* in both ancient and modern science provided a well-established concept of *Kala*. If one aims to know about the *Vikruti* of *Kala* by means of anatomy or physiology, one must have to know the *Prakruti* of the *Kala* first. Thus, in medical science for the betterment of diagnosis, critical study of *Kala Shareera* as per *Ayurveda* in *Rachanatmaka* and *Kriyatmaka* aspects as well as modern aspect are very important.

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