

A CLINICO-ANATOMICAL APPROACH TO KALA W.S.R. TO PITTADHARA KALA- A CONCEPTUAL REVIEW

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ABSTRACT

Ayurveda, being a medical science, deals with the human body. There are many concepts in *Ayurved*, regarding human body. Concept of *Kala* is one of them. *Kala* are defined as a structure between *Dhatu* and *ashaya*. These *Kalas* are not only mere anatomical structures but also they perform some specific functions and possess specific properties. *Kala Sharir* gives us information about the important membranes and layers of the body. They also produce and hold the *Dhatus*. They can be understood by their functions in the body. There are 7 types of *Kala* described in *Ayurveda* by different *Acharyas*, specific *Kalas* are located at specific sites one of them is *Pittadhara kala*. It is situated between *Pakwamashaya*. *Pittadhara Kala* can be compared as mucous membrane of small intestine. It play major role in digestion in our body Thus, a precise knowledge of *Kala* is important for physicians to make a diagnosis at the right time & also to know if the disease is at the level of *Kala*. There is no clear concept regarding to *Pittadhar Kala* so now try to it describe about *Pittadhar Kala*.

KEYWORDS: *Kala, Ashaya, Amashaya, Pittadhara Kala, Dhatu, Duodenum.*

INTRODUCTION

Ayurveda, being a medical science, deals with the human body. The pioneers of this ancient science were well versed of the human body, both its external and internal form.

The various *Samhita* (methodically arranged collection of texts or verses) written by different *Acharya's* contain numerous description about human body. All the major *Ayurveda Samhita* have a separate section left apart to describe the human body namely *SharirSthana*. The word *Sharira* means that which is "related to the body". It deals with both the structure and functioning of the human form.

Though a separate *Sharir Sthana* is given in all the *Samhita*, the references related to the human body are found in all parts of these texts, mostly being described in contexts of their applied aspects in medical practice.

Kala is a thin membrane, which is the lining of the internal cavity of *Ashayas*, organs, blood vessels and fibrous capsules of joints etc. *Kala* is important and unique concept described in *Ayurveda* but still remains unexplained. While analysing the references related to *Kala Sharir* given in various *Samhitas*, their relation to the modern concept of *Kala* were evident.

KALA

Kala are described by *Acharya sushrut* in *Sharirsthan*. *Kalas* are 7 in number.^[1] *Pittadhara Kala* is 6th out of these seven.^[2] There is *Ashraya* and *Ashrayee* relation between *Pittadhara kala* and *Agni*. If Physiology of *Pittadhara Kala* is maintained normal, then only function of *Agni* will be conducted properly. All the diseases are caused due to impaired functions of *Agni*.^[3] Anatomically *Kala* is describe detail in *Ayurvedic* texts.

It is the layer that differentiates/separates *Dhatu* from its *Ashaya* (*Dhatwashayaantarmaryada*).^[4] Seven *Kalas* (membranes) also appear as structure intervening between *Dhatus* (*Rasa, Rakta*, etc) and their seat *Ashayas* (visceras). Here all *Dhatu* also denotes *Doshas* and *Malas* as they too support the body. The *Kalas* are seven in number i.e. *Mamsdhara, Raktadhara, Medodhara, Shleshmadhara, Purishdhara, Pittadhara, Shukradhara*.^[5] *Maharishi Sushrut* described all *kala* as (table no.-1) –

Table no. 1: Classification and description of seven Kalas.

S.N.	KALA NAME	SPECIAL SITE
1.	Mamsadhara Kala	Present at <i>Mamsa</i> (muscles), <i>Sira</i> (veins), <i>Snayu</i> (tendons), <i>Dhamni</i> (arteries) and <i>Srotas</i> (capillaries) ^[6]
2.	Raktadhara Kala	Present at inside <i>Mamsa</i> (muscles) and specially in <i>Sira</i> (veins), <i>Yakrat</i> (liver) and <i>Pleeha</i> (spleen) ^[7]
3.	Medodhara Kala	Present at <i>Udar</i> (abdomen) of all <i>Prani</i> (animals) and <i>Anuasthi</i> (small bone) ^[8]
4.	Shleshmadhara Kala	Present at all <i>Sandhies</i> (joints) of all animals ^[9]
5.	Purishdhara Kala	Present at <i>Koshtha</i> and divide <i>Mala</i> in <i>Pakvashaya</i> ^[10]
6.	Pittadhara Kala	Present at between amashaya & Pakvashaya and receive all four type of foods ^[11]
7.	Sukradhara Kala	Present at <i>Sarv Sharir</i> (all over body) specially in male sex organs ^[12]

Kala is a unique concept explained by Acharya Sushrut in *Sushrut samhita*, *Sharirasthan* in *Garbhavyakaran* chapter. We find references in *Ashtang Hridayam*, *Sharirasthan* in *Angavibhaga Shariram* chapter as well as in *Ashtang Sangrah* and *Sharangdhar Samhita*. All Acharya have explained seven *Kalas* which is similar to *Sushrut samhita*, but in *Sharangadhar Samhita*, location of fourth *Kala* is stated to be at *Yakrut* and *Pleeha*.^[13]

While describing *Kala*, it is said as the duramen of cores of a piece of wood or stem becomes exposed to view by cutting into it, so the *Dhatu*s of the body may be seen by removing the successive layers. These *Kalas* are extensively supplied with *Snayus* bathed in *Jarayu* and encased in *Shleshma*.^[14]

PITTADHARA KALA

The sixth *Kala* is *Pittadhara Kala*. It holds all type of food intaken by mouth into intestine. The four kinds are *Asit* (Chewed), *Khadit* (Swallowed), *Peeta* (Drunk liquid), and *Leedh* (Licked), and brought into *Kshudrantra* (Small intestine).^[15] Here it is digested and absorbed in due course of time by the action of *Pitta* (digestive enzymes). Hence the term *Koshtha* is used in reference to *Laghuantra* (small intestine) where *Pittadhara Kala* is labelled as '*Grahani*'. Acharya Sushrut described *Pittadhara Kala* is located between *Amashaya* (stomach) and *Pakwashaya* (large intestine) and it is also the site of *Grahani*.^[16]

Modern view

Kala is a thin membrane, which is the lining the internal cavity of organs, blood vessels and fibrous capsules of joint etc.

Pittadhara Kala can be compared as mucous membrane of small intestine. The small intestine is the longest part of the GIT. It is about 6 meter long. It extends from the pylorus to the ileocaecal junction. Anatomically, it is divided into three parts: Duodenum (fixed upper part), Jejunum and Ileum. The latter two parts are mobile.

Clinically, only the mobile part is considered as the small intestine. Its initial 2/5th is called jejunum and terminal 3/5th, the ileum. The small intestine forms convoluted

folds (loops) and is located in the central region of abdomen. The mucous membrane of small intestine presents closely packed circular folds (valve of Kerkring) with finger like projection on them called villi. The submucosa contain aggregation of lymphoid follicles, the Peyer's patches which have a maximum concentration in the terminal part of the ileum. The main function of the small intestine is absorption of nutrients from digested food.^[17]

HISTOLOGY OF SMALL INTESTINE

- A. The innermost layer is mucous membrane that is made up of
 - a. Lining epithelium
 - b. A layer of connective tissue (lamina propria)
 - c. Thin layer of smooth muscle (muscularis mucosae)
 - d. The mucous membrane rests on a layer of loose areolar tissue (submucosa)
- B. The gut wall derives its main strength and form because of a thick layer of muscle (muscularis externa) that surrounds submucosa.
- C. Covering the muscularis externa there is a serous layer.

CLINICAL ANATOMY OF KALA

Pittadhara Kala received semi digested food propelled from *Amashaya* (stomach) and contained in *Pakwashaya*. It distinctly hold the food till the food is totally digested and also digest the all four types of food (*Asit* (Chewed), *Khadit* (Swallowed), *Peeta* (Drunk liquid), and *Leedh* (Licked)).^[18] *Pittadhara Kala* resembles *Grahani*. It has *Agni* /metabolic fire in it. *Pittadhara Kala* also situated at *Grahani*. Anatomically *Grahani* is correlated with Duodenum which is the part of small intestine. Physiologically it has several glands, they secrete the digestive juices and help in digestion.

DISCUSSION

All Acharyas are agreed and accepted that *Kalas* are demarcating line between *Dhatu*s and *Ashayas* i.e. *Dhatwashayantarmaryada*. The *Kalas* are seven in number i.e. *Mamsadhara*, *Raktadhara*, *Medodhara*, *Shleshmadhara*, *Purishdhara*, *Pittadhara*, *Shukradhara Kala*.

Ayurveda classics define the location of *Pittadhara Kala*, found in “*Pakwa-Amashaya Madhya*”.

Acharya Sushruta has stated that responsible factor for the generation of heat in the body is known as *Pitta*. There are five types of *Pitta* and *Pachaka Pitta* is one of them.^[19] *Pachakagni* is described by *Acharya Sushruta*. *Pitta* is often referred to as *Agni*. Thus, referring to all the alternative words used for *Agni*, the *Pitta* can also be called as *Anala*, *Pachakagni*, *Jatharagni*. Sixth *Kala* is *Pittadhara Kala*. In *Sharira Sthana*, *Acharya Sushruta* has described the seat and functions of *Pittadhara Kala* which resides in between *Amashaya* and *Pakwashaya*. This *Kala* receives four types of food materials namely *Asita*, *Khadita*, *Peeta* and *Leedha* and facilitates its assimilation, absorption and digestion. Afterwards it allows the passage of food material further down into *Pakwashaya*.^[20,21]

Acharya Sushruta in *Uttartantra* 40th Chapter of “*Atisarpatisedha Adhyaya*” has quoted that the sixth *Kala* which is located in between *Amashaya* and *Pakwashaya* which hold *Pitta* known as *Pittadhara Kala*. *Pittadhara Kala* is denominated as *Grahani*. This *Kala* is also called as *Grahani* because it receives food material. Its functions are manifested in the form of *Agni* or *Pachakagni*.

In *Ayurvedic* classics it is clearly mentioned that the area which lies in between *Amashaya* and *Pakwashaya* is “*Kshudrantra*”. Therefore the *Kshudrantra* i.e. small intestine is the probable structure where the *Pittadhara Kala* lies. *Acharya Sushruta* has coined a synonym i.e., *Grahani* for *Pittadhara Kala* in *Uttartantra* chapter 40. So structurally it may be presumed that *Pittadhara Kala* is extended from the distal end of stomach upto the ileocaecal junction.

In *Amashaya*, *Chaturvidh Ahar* is digested, absorbed and assimilated through *Pittadhara Kala* by the help of *Pachaka Pitta* and residual part is transported to *Pakwashaya* for further processing.

Same different function are present in duodenum and that is *Grahani* or site of *Pittadhara Kala*.

CONCLUSION

The maximum digestion takes place in duodenum which is supported by- the large length of small intestine provides more surface area for absorption. The intestinal glands are scattered over the entire mucosa of jejunum and ileum. Villi are large as well numerous in the duodenum and jejunum. So, we conclude that the greater length, circular folds as well intestinal glands are the main characteristics of small intestine which helps in performing digestion and absorption which is the basic function of *Pachak Pitta* so we can easily correlate with *Pittadhara Kala*.

Anatomically *Pittadhara Kala* is extended from the distal end of stomach upto the ileocaecal junction. So it can be concluded that in *Ayurveda*, *Pachaka Pitta* with the help of *Samana Vayu* and *Kledaka Kapha* performs the *Pachana Karma*. *Kledaka Kapha* helps in binding of the food particle to villi and microvilli and *Pachakagni* provides energy or ATP for active transport in process of absorption. If any changes (anatomical or physiological deformity) of *Pittadhara Kala* occurs it causes digestive disorder and produce *Mandagini* (low digestive power). *Mandagini* thus produce *Ama* and *Ama* is the main cause of all *Roga*. So disturbances of anatomy and physiology of *Pittadhara Kala* are clinically importance in human health and disorders.

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