

**The Correlation of structure, Kala to The Strotasa According to Ancient  
Ayurvedic As Well As Modern Science**

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**Abstract:**

*The concepts of Ayurveda are like roots of the tree. Among them the Kala and Strotasa are very basic and useful concepts. The potency of these channels is necessary to maintain healthy status of body. The structure described as kalacana be correlated to strotasa according to Ayurveda as well as modern point of view, though the definition, description and the function of the two structures being different. The obvious difference and identity between kala and strotasa, especially they later relate to their structure and function. In present context the kala described as the pittadharakala which is correlated with Annavaahastrotas.*

**Keywords :-** Ayurveda, Kala, Strotasa, Sara, Kitta, Dhatu, Ashay, Sira, Dhamani.

**Introduction:**

According to Ayurveda, human body is a conglomeration of Strotasa. Body is composed of numerous strotasa which have significant role in the maintenance of the equilibrium of the body. 'Charak' has defined strotasa as a structure through which oozing takes place<sup>1</sup>. 'Sushruta' has defined kala as the fine structures that separates the Dhatus from their Ashayas<sup>2</sup>. The dhatus referred to here are seen to be the elementary tissues, which in Ayurveda are: the rasa (plasma, tissue fluid and lymph); rakta (the erythrocytes); mansa (muscle tissue); meda (adipose tissue); asthi (bone including cartilage tissue); majja (marrow tissue) and shukra (reproductive tissue)<sup>3</sup>.

If the function of the strotasa is to permit the passage of material from one side to other through it by exudation, filtration, permeation and oozing. According to Sushruta functions of kala are, seen generally to refer to such structure as the lining and supporting membranes which are, as we see today, composed of epithelial and endothelial tissues. Hence in a view of Sharira Rachana and Sharirakriya, a detailed & clear knowledge of correlation of these two structures i.e. kala and strotasa become very much necessary as it is responsible for carrying and transformation of tissue elements there by maintain the health.

**Discussion :**

**Annavaahastrotas and kalas :-**

The terms Mahastrotas and koshtha are strictly anatomical. They refer to gastro-intestinal tract as a whole. On the other hand, the term annavaahastrotas has been included in the list of strotansi. The term annavaahastrotas points to the function performed by this channel viz., the transportation of food. Its modern equivalent is alimentary canal i.e. the channel in which alimentation takes place. Ingestion, digestion and egestion are referred together as alimentation.

The annavaahastrotas implies not only the structures immediately concerned with the foregoing three processes but it also refers to the functions of the minute channels of transport of the digested food from the intestine to the circulating fluid medium, described in Ayurveda as rasadhatu and blood plasma in modern physiology. Atreya was quoted elsewhere as having described the annapakanadiya being composed of kala (lining mucosal membrane) and peshi (muscles). The kala performs very important functions, they are

digestion of the ingested food and the transport of the food digested to the circulating *rasa (rakta)* through intestinal barrier.

#### **Seven kinds of kalas :-**

Seven kinds of *kalas* have been described by *Sushruta*<sup>4</sup>.

As follows- 1) *Mansadharakala*      2) *Raktadharakala* 3) *Medodharakala*      4) *Shleshmadharakala*  
5) *Purishadharakala*      6) *Pittadharakala* 7) *Shukradharakala*

According to *Sushruta* The sixth *kalas* situated between the *pakwashaya* and *amashaya* is the *pittadharakala* and is known as the *Grahani*.<sup>5</sup> Its main function is to provide *pachakpitta* which is necessary for the process of digestion of the food brought to this part of *koshta* from the *urdhwamashaya* (stomach) on its way to *pakwashaya* (large intestine) and to retain the food in this part for the duration of its digestion and the separation of the *sara* (nutrient fraction) from the *kitta* (undigested food residue).<sup>6</sup>

*Purishdharakala* is stated to extend from *yakrit* (liver) to the *antras* (small and large intestine) and other abdominal viscera. It is said to separate *sara* of the food from *kitta*. The portion of this *kalas* present in the *unduka* (caecum) is claimed to take over this function.<sup>7</sup>

#### **Modern equivalence of kala :-**

The description in the present context, of the *pittadhara* & *purishadharakalas* draws attention to the covering membranes of the small and large intestines. The epithelium with which the covering membranes of these two parts of the gastro-intestinal tract is composed of the simple columnar type. The glandular diverticula forms the gastric glands, Brunner's glands and the Crypts of Lieberkuhn, in the whole extent of the small intestine, constitute the glands of this part. Those covering the villi of the small intestine are concerned with the absorption of the products of the digestion.

The epithelial cells that line the serous cavities provide a smooth moist surface. In most cases, they compose the semi-permeable membranes through which material pass to and fro in the course of their secretory and excretory activities.

#### **Correlation of kalas and strotasa according to Ayurveda :-**

It is important to note that *Sushruta* has excluded *Siras* (veins) and *Dhamanis* (arteries) from the scope of *strotasa*<sup>8</sup> and compared the *strotasas* to the fine channels present in the lotus stem through which fluids circulate and exude.<sup>9</sup>

It will thus be seen that regardless of their individual structure and specific function, *strotas* are, for most the part, (semi-)permeable and they permit the passage of material from one side to another. In this sense, the *kala* of the *annapakanadi* is composite of two kind of *strotas* viz., a type which draws raw materials from the circulating *rasa-rakta*, contrives them as *pachak pitta* and secretes this *pitta* complex into the *pachyamanashaya* or *agnyashaya* (also known as *adho-amashaya*, *grahani* and *kshudrantra*) to facilitate *annapachan* and *sara-kittavibhajan* and another type, which permits the *rasa* or *annarasa* (chyle) to permeate through it and pass on the circulating *rasa-rakta*.

#### **Conclusion :**

From above description, looked at from the *Ayurvedic* point of view, these are *strotas* and they compose the *kalas*. The *kalas* part of the *annavahanadi* comprising as it does of *pittadhara* and *purishadharakalas*, function through the different kinds of *strotas* that compose them..

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