

ANATOMICAL CONSIDERATION OF *DHAMANI* AS A *MOOLA* OF *SROTAS* IN MODERN PROSPECTIVE

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ABSTRACT

A channel that transports only *dhatu* under metabolic transformation is called *srotas*. According to some authors, the *srotas* may be interpreted as micro-vascular carrier, which is specialized for exchange of the materials. The exchanges of materials between interstitial fluid and intra capillary substance move through highly specific pores, which are called *ayana*. *Srotas* are the hollow channels except *sira* and *dhamani*, which originating from root space and spreads in the body and carries specific entities. There are a many number of types of *srotas* mentioned by different authors. Each *srotas* is attached to a specific anatomical structure called *moola*. Although *sushruta* says that *srotas* are tubular structure different from *dhamani* and *sira*, but he had also accepted that *moola* of many *srotas* are *dhamani*. The normal functioning of the particular group of channels (*srotansi*) is depends upon it's *moolasthan*. In general the term *moola* means roots or origin. But in reference to *srotas*, they are the two cardinal organs; directly or indirectly related with the scattered *srotas* of the body. Any abnormalities in these peripheral *srotas* ultimately can effect on the *moola* (organ). Through *moola* one can access blindly the physiological status of *srotas*, or also one can be able to treat the disorders by choosing the drug which will be acting upon.

Keywords- *ayurveda, dosha, srotas, dhamani, moola.*

INTRODUCTION –

Dosha, dhatu, mala is considered as the basis of the body. In *Ayurveda purusha* is called as *srotomaya* because *srotas* are present all over the body. To understand the concepts of vascular system of body, we should first understand the concept of *srotas, sira* and *dhamani*. We generally relate all these as the channels of the body which are assigned a job of carrying substances within the body. It is well admired fact that *acharya sushruta* managed to trace even minute to minute channels present in the body. He was able to recognize the ever pore in the skin that had its own nerve, blood and lymphatic supply. It was calculated that there were about 700 *siras*, 200

dhamanis, which could be easily enumerated but when the minute *siras* and *dhamanis* were counted with their tributaries and branches, there number was estimated to be the same as the number of hair follicles¹. Hence it can be said that the study of anatomical aspect of the body was at very peak in those days. They were able to reach to maximum nearest to the anatomical survey of the body. The *Ayurvedic* classics proclaim *srotomayam hi shariram* meaning that the living physical body is a channel system and/or is comprised of innumerable channels designed as an inner transport system for divergent functions, both gross and subtle,

tangible and intangible, biologic and energetic².

The entire range of life processes in health and disease depends on the integrity of the *srotas* system which is prone to lose its integrity due to out-of-order lifestyle, faulty food, and day-to-day wear and tear warranting periodic *samshodhan* or bio-purification for which *Ayurveda* has developed its therapeutic technology popularly called *Panchakarma* therapy. *Sushruta* had used the word *dhamanis* to some of the *mula sthanas* of *srotas*, but he had not used any *siras* as the *mula sthana* of a *srotas*.

Relation of dhamani with srotas - Structure that which originates from vacant spaces (hollow organs) spread throughout the body and purveys materials- are to be understood as *srotas* (channels) and apart from *sira* (vein) and *dhamani* (artery)³. Acharya charaka says that, *srotas*, *sira* (vein), *dhamani*, *rasayani* (lymphatic channel), *rasavahini* (capillary), *nadi* (duct), *pantha* (passage), *marga* (track), *sariracchidra* (spaces inside the body), *samvritasamvrita* (duct closed at one end and open at the other), *sthana*, *ashaya* and *niketa* – these are the names attributed to various visible and invisible spaces inside the tissue elements of the body⁴. charak says that, because of pulsation, some of them are called 'dhamani', because of transudation some of them are called 'srotas' and because of the action of simply carrying a substance from one place to another, some others are called 'sira'⁵. The above *sloka* is dealt in *sutra sthana*. In this *sthana*; the important *sutras* are mentioned in tiny form, like many flowers are tied together by a thread to make a garland. However, *acharyas* have mentioned about the number of *dhamanis*, detailed description about the *srotas* and the number of *siras* in different *sthanas*, but their definitions are explained in this *sthana*. It is mentioned after explaining the importance of the *hridaya* and the substances related to it like *ojas* etc. so by looking into this *sloka* gives an idea

that it can be considered as the functional unit of *hridaya* (i.e. circulatory system). The last question is that in which order the word have been used? This order has an important significance; the first word is about *dhamani* i.e. '*dhmanaddhamanyah*'. It indicates that where the pulsation can be felt that is called as *dhamani*, and this can be felt or seen only in arteries, not anywhere else in the body. The second word is: '*sravanat srotamsi*'. The word *sravan* means- flowing, trickling & oozing. It is also said that in the body increase or decrease of the substances are due to *srotas* itself. So the exchange of substances can take place at the capillary level only, which can help in increase/decrease of the substances in the body. Due to this reason the capillaries can be allied to *srotas*. The last word in the *sloka* is: '*saranatsira*'. The word *sarana* means- going, moving & flowing. The *sira* are that which carry the *rakta* from capillaries to heart, when we look into the references we find *sira vedhana* for *rakta mokshan* but not the *dhamani vedhan*. The reason is because the *dhamani* carry *prana* and *ahara rasa*, so *dhamani vedhana* is contraindicated. *Acharyas* also explained about *avedhya siras*, it indicates that all the *siras* cannot be subjected to *sira-vedha*, because some of the *siras* are more deep seated in the body and some of the *siras* may also carry *prana* in them like pulmonary veins which carry the oxygenated blood in it. Whereas *siras* carries the deoxygenated blood with fewer nutrients in them, and also we have *vataja sira*, *pittaja sira* etc. which are related to the *doshas* and where as *dhamanis* are classified as *urdhwaga dhamanis*, *adhogami dhamanis* etc. due to this reason only the *doshas* of the body can be removed by *sira vedhana* but not by the *dhamani vedhana*⁶.

The term *moola* is used in different meanings in ancient Indian literatures. In *Rigveda* this term is used for *vitta* or *dhana*, in *Mahabharat* the term *addyam* (origin or Starting) is used, in *Markandeya purana* term

'jyesthasumule' is used which is related to *nakshatra*, here term *nikunja* and *antikum* (finish or last part) is also used. *Acharya charaka* has used this term in meaning of *karan* or *adhara* (reason/base). In *Sushruta samhita* and *Astanga Hridaya*, *moola* word has been used as tracer, director or prob. *Chakrapanidutta* said that "*mulamiti prabhav sthanam*" means that which originate (origin place)⁷.

Determination of moolasthan of srotas-

For the determination of *moolasthan* of *srotas* some points have been logically and categorically counted in the various classics. Such as-

- 1) *Utpatti sthana* (*moolasthan* related with origin point of view)
- 2) *Sangraha sthana* (*moolasthan* related with storage)
- 3) *Vahana sthana* (*moolasthan* related with conduction)
- 4) *Naidanic drishtikon* (*moolasthan* related with diagnostic point of view)
- 5) *Chikitsatmak drishtikon* (*moolasthan* related with clinical point of view)

Among the above mentioned points some points are considered in combinations in some contexts and considered separately in some contexts to determine the source of *moolasthan*. But the clinical standpoint has been considered in all the cases of determinations of the *moolasthan*⁸. Observation as per clinical point of view In this context, after keen observation it is clear that, the *moolasthan* of *srotas* can be divided basically into two types- a) *Sthaniya niyantrak* (local controller), b) *Pramukha niyantrak* (unique controller).

It can be considered that, all above explained *moolasthan* are local controllers of their corresponding *srotas*. The two centers each mentioned as *moolasthan* in context of one *srotas*, primarily controls the activities of their corresponding *srotas* only. But there might be a super or unique controller who controls *moolasthan* of all *srotas* e.g. in relation to *rasavaha srotas*, *hridaya* and *dasha-*

dhamani are local controllers and not super controllers. *Mahasrotas* is the basic substratum for all vital management procedures in the *ayurvedic* line of treatment. In disease of any *srotas* it is impossible to complete *shodhan chikitsa* as well as *shaman chikitsa* without support of *mahasrotas*. In this regard, *mahasrotas* is justified as unique or super controller of all *srotas*⁹.

Susruta had used the word *dhamanis* to some of the *moolasthanas* of *srotas*, but he had not used any *siras* as the *moolasthan* of a *srotas*. It is sure that *dhamanis* can only act as *moolasthan* but not the *sira* because they carry deoxygenated blood and they are situated after the *srotas* so they cannot become as *moolasthanas* of any *srotas*. He had not considered *dhamanis* as *moola sthanas* of the following *srotas*, they are- *udakavaha*, *medavaha*, *mutravaha*, *sukravaha* and *purishavaha srotas*, the reason may be that these *srotas* may not be related directly with any *dhamanis* and some of them are *malas* so they not require any *dhamanis* to the *moolasthanas* of these *srotas*. But when we look as per the modern view the formation of *mootra* takes place by filtration from the capillaries only but still he had mentioned *dhamanis* which lie before these capillaries because the concept of *mootra* formation as per *ayurveda* is different from the modern science.

Regarding the number/types of *srotas* it is mentioned that number of substances having definite shape are there in this universe that much types of *srotas* are there in the body. Some opine it is numerable and others opine it is innumerable. These channels have the color similar to that of the *dhatu* that they carry; they are tubular, either large or small in size and either straight or reticular in shape. The reasons for the vitiation of the *srotas* their pathological features and treatment for the same is mentioned. Increase or obstruction in the flow of the contents of the channels, appearance of nodules in the channels and diversion in the flow of the

contents to improper channels are the general signs of the vitiation of the *srotas*¹⁰.

TABLE SHOWING MAIN SROTAS AND THEIR MULA AS DHAMANI

Name of <i>Srotas</i>	<i>SUSHRUTA</i> (<i>Su.sha.</i> 9/12)	<i>CHARAK</i> (<i>Charak Vi.</i> 5/7)	<i>VAGBHATTA</i> (<i>A.S.Sha.</i> 6/34-50)
	<i>Mula</i>	<i>Mula</i>	<i>Mula</i>
<i>Prana Vaha Srotas</i>	<i>Hridaya and Rasa vahi Dhamanies</i>	<i>Hridaya and Maha Srotas</i>	<i>Hridaya and Maha Srotas</i>
<i>Anna Vaha Srotas</i>	<i>amashaya and Anna vahi Dhamanies</i>	<i>amashaya and Vama Parswa</i>	<i>amashaya and Vama Parswa</i>
<i>Rasa Vaha Srotas</i>	<i>Hridaya and Rasavahi Dhamanies</i>	<i>Hridaya and Ten Dhamanies</i>	<i>Hridaya and Ten Dhamanies</i>
<i>Rakta Vaha Srotas</i>	<i>Yakrit, Pliha and Rakta vahi Dhamanies</i>	<i>Yakrit and Pliha</i>	<i>Yakrit and Pliha</i>
<i>Mamsa Vaha Srotas</i>	<i>Snayu, Twaka and RaktaVahidhamaniya</i>	<i>Snayu and Twaka</i>	<i>Snayu and Twaka</i>
<i>Artava Vaha Srotas</i>	<i>Garbhashaya and artavavahi dhamanies</i>

Pranavaha srotas- As per *sushruta* the *moola sthanas* of *pranavaha srotas* are *hridaya* and *rasavahini dhamani*. So what is *rasavahiniya dhamanis*? It can be considered as the vessels which carry *rasa* in the body. In the body *prana* and *rasa* are moving in same channel so *Acharya* has used the word as '*rasavahiniya dhamanis*' for both *pranavaha* and *rasavaha srotas*. But from where these *rasavahiniya dhamanis* will start in the body? And how they have to be understood? As both *prana* and *rasa* move in same channel, but at which level these two will enter into the systemic circulation is the question. To understand this we should look into the digestive, absorption and respiratory systems.

The digestion is carried out from oral cavity up to the small intestines and absorption starts from mouth to large intestines into the venous system. The absorption at small intestines is the most important, which drains mainly by superior mesenteric vein and inferior mesenteric veins. The superior mesenteric vein and splenic vein combines to

form portal vein and inferior mesenteric vein will be attached to the splenic vein. The portal vein now enters into the liver where maximum metabolic process are completed and from there the absorbed food materials along with blood will enter into inferior vena cava which ultimately reaches to the right atrium which is mixed along with the deoxygenated blood drain from the whole body, so the fluid which reaches to the right will be of much nutrition with less oxygen. From right atrium it reaches to the right ventricle and from there through pulmonary trunk it reaches to lungs, where it is converted into oxygenated fluid and reaches to left atrium through pulmonary vein, now this fluid is reach in both nutrition and oxygen. Then it enters into the left ventricle from here the heart first receives the blood and then it gives to rest of the body through aorta for nourishment of the tissues. So the vessels which carry the fluid which is more predominant of nutrition and oxygen should be considered as *rasavahiniya dhamanis*¹¹. *Charaka* and *vagbhata* had says that, the

moola of *pranavaha srotas* is *hridaya* and *mahasrotas*.

Annavaaha srotas- the concept of *annavaaha srotas* as per *sushruta* is much clear. He had considered as *amashaya* and *annavahini dhamani*. *Amashaya* is clear which we have seen and what about *annavahini dhamanis* and to which these has to be related? Here this *srotas* is mainly related to one among the *bahya pranas*. The word *anna* indicates all the food material which is entering into the body and they will nourish each and every structure of the body. So, all the arterial blood vessels can be related to the stomach is called *annavaaha dhamanis*¹².

Rasavaaha srotas- According to *charak* and *vagbhatta*—the *moola* of *Rasavaaha srotas* is *hridaya* and related ten *dhamanis*. *Dhatuvaha srotas* are called as *abhyantara pranas* of the body. The first question is why *hridaya* and *rasavahini dhamanis* are considered as *moola sthana* of this *srotas*? No doubt *hridaya* is essential in transporting all the nutrition of the body to the tissues, but still why it is considered only to this *srotas* and to *pranavaha srotas* only what might be the reason beyond this? Among these two *moola sthanas*, first one is very clear and where as second one is not much clear. In *sutra sthana charaka* mentioned a chapter as *arthedashamahamooliya* chapter in which he explained about the *hridaya* regarding the importance, structures related to it and how to protect it from external and internal factors. But in this chapter he did not mentioned about the ten *dhamanis* which are related to *hridaya* in detail. Some people have related the ten *dhamanis* as follows: 1. Right coronary artery 2. Left coronary artery 3. Superior vena cava 4. Inferior vena cava 5. Pulmonary trunk 6. Aorta 7-10. Four pulmonary veins. Totally these 10 have been considered as ten *dhamanis* as per some authors. As per *sushruta* the *moola sthanas* are *hridaya* and *rasavahini dhamani*. Here *sushruta* has said that one *lakshana* as extra than the *pranavaha srotas viddha lakshana*

which is '*shosha*' and the remaining all are same which are explained in *pranavaha srotas*. Because this *srotas* has a main role in nourishing the body parts and also essential in formation of remaining *dhatu*s in the body so *sushruta* had considered this *lakshana*¹³.

Raktavaha srotas- As regards, the formation of *raktadhatu* and its distribution, the *Ayurveda* takes into account a group of organs involved in the process of genesis directly or indirectly. From these organs, the *raktadhatu*, after getting originated follow certain tracts or roots to reach in the channels of greater circulation. Thus the channels carrying the *raktadhatu* from its sites of origin to the pumping place of greater circulation and from there to each and every part of the body appear to come under the heading of *raktavaha srotas*. According to *Charaka*, *yakrit* (liver) and *pliha* (spleen) is the root of *raktavaha srotas*. *Sushruta* also stands with the same view with *charaka* considering the *raktavaha srotas* he has mentioned that they are of two types and regarded the *yakrit*, *pliha* and *raktavahi dhamaniya* as a root of *raktavaha srotas*. *yakrit* and *pliha* both are most important organs of the body. They are soft organs, formed from the *raktas*, *matrija* (maternal) in origin, place of *ranjak pitta*, *moola* of *raktavaha srotas* etc. The blood is located in liver and spleen. The *sara* produced by digestion of *rasa* is responsible for formation of *pliha* and *yakrit*. *Yakrit* and *pliha* of fetus are formed from *sonita* (blood).

The *Pitta* present in the *Yakrit* is responsible for converting *rasa* into *Rakta*. *Raktavaha srotas* are two, their root/chief organs are liver, spleen and *raktavahi dhamaniya*. *Ghanekar* has said that portal circulation may be taken for *raktavahi dhamani*.

Mansavaha srotas : according to *charaka*, *mansavaha srotas* have their *moola* in *snayu* (ligaments) and *twak* (skin). *Acharya sushruta* says that *moola* of *mansavaha srotas* is *snayu* (ligaments), *twak* (skin) and *raktavahi dhamanis*. Here, the carrier of muscle

tissue are two. Their root is *snayu* (nerves), *twak* (skin) and *raktavahi dhamanis* (blood capillaries). The nerve innervate the myotome. The blood vessels are the real suppliers of protein, calcium and other substances to muscle, where as the skin gives support to the skeletal muscles. An evidence in support of the *snayu* is that capillaries distribution to cells in body varies with its metabolic activities of the tissue. They serve; such as muscle requires high metabolic activities therefore it has an extensive network of capillaries. While tendon, ligaments contain fewer capillaries. For this reason one who want to repair a *snayu* (ligamental injuries) they has to make an approach through the *mansavaha srotas*.

Artavavaha srotas- Among the type of *srotas*, *artavavaha srotas* (which does *artavavahan*) is given prime importance which is only present in females. The root of *artavavaha srotas* is considered as *garbhashaya* (uterus) and *artavavahi dhamani* (vessels carrying *artava*). Injury to *artavavaha srotas* leads to infertility, dysperunia and dysmenorrhea. As per context *artava* can be considered as ovum and menstrual bleeding i.e. *beejarupi artava* and *dristartava* respectively. *Artava* can be considered as ovum and menstrual bleeding i.e. *beejarupi* and *dristartava* respectively. The *beejarupi artava* released from ovary reaches the *garbhashaya* and unites with *sukra* to form *garbha*. *Artava* which is accumulated in a month is drawn towards the vaginal orifice by *vata* through the *dhamanis* and this is called as *dristartava*. Considering two dimensions of the word *artava* and *garbha* formation, *moola* of *artavavaha srotas* is being mentioned as *garbhashaya* and *artavavaha dhamani*. The release of *beejarupi artava* will be fruitful when it reaches the *garbhashaya* and unites with *sukra* and forms *garbha*, hence *garbhashaya* is considered as one of the *moola* of *artavavaha srotas*. For a fruitful coitus period *rajasrava kala* plays an important role which is due to *vahan* of *artava* through *ar-*

tavavaha dhamani, hence *artavavaha dhamani* is considered as the *moola* of *artavavaha srotas*¹⁴.

CONCLUSION

It is sure that *dhamanis* can only act as *moola sthana* but not the *sira* because they carry deoxygenated blood and they are situated after the *srotasas*, so *sira* can not become as *moola sthanas* of any *srotasas*. *Dhamanis* is not considered as *moola sthanas* of the following *srotasas*, they are- *udakavaha*, *medavaha*, *mutravaha*, *sukravaha* and *purishavaha srotasas*, the reason may be that these *srotasas* may not be related directly with any *dhamanis* and some of them are *malas*, so they not require any *dhamanis* to the *moola sthanas* of these *srotasas*.

REFERENCES

1. Agnivesha, Sharirshankhya shariram 7th chapter, sharir sthan in Sharma RK and Dash B. Charak samhita (with English translation and critical exposition based on Chakrapani dutt's Ayurveda dipika) vol II, Chowkhambha Sanskrita Series, Varanasi, sixth Edition; 2009. p.457.
2. Agnivesha, Srotasam Vimanam 5th chapter, vimana sthan in Sharma RK and Dash B. Charak samhita (with English translation and critical exposition based on Chakrapani dutt's Ayurveda dipika) vol II, Chowkhambha Sanskrita Series, Varanasi, sixth Edition; 2009. p.177.
3. Susruta, Dhamanivyakarna 9th chapter, sharirasthan in Murthy Shrikant KR, Susruta Samhita Vol. I, English translation Chowkhambha orientalia, Varanasi, Reprint edition; 2010.p.151.
4. Agnivesha, Srotasam Vimanam 5th chapter, vimana sthan in Sharma RK and Dash B. Charak samhita (with English translation and critical exposition based on Chakrapani dutt's Ayurveda dipika) vol II, Chowkhambha Sanskrita Series, Varanasi, sixth Edition; 2009. p.177.

5. Agnivesha, *Arthedasamahamuliya* 30th chapter, sutra sthan in Sharma RK and Dash B. Charaksamhita (with English translation and critical exposition based on Chakrapani dutt's Ayurveda dipika) vol I, Chowkhambha Sanskrita Series, Varanasi, sixth Edition; 2009. p.596.
6. Susruta, *Siravyadhvidhishariram* 8th chapter, sharirsthan in Murthy Shrikant KR, *Susruta Samhita Vol. I, English translation Chowkhambha orientalia, Varanasi, Reprint edition; 2010.p.143.*
7. M.D.(Ay) thesis, *Aconceptual study of Raktavaha srotas moola with special reference to its applied anatomy, 2009, Dr. Bhan Pratap Yadaw, Department of Rachana Sharir, Faculty of Ayurveda, IMS, BHU, Varanasi*
8. Paper published by Pawar Pradeep Shivram et al. *IRJP* 2012, 3 (6) *An analytical outlook of determination of the Mulasthan of Srotas.*
9. Alapati Vinod Kumar & Alapati Satya Prabha, *Compendium views on sroto sharira, chaukhambha orientalia, Varanasi, first edition-2008, page-4*
10. Alapati Vinod Kumar & Alapati Satya Prabha, *Compendium views on sroto sharira, chaukhambha orientalia, Varanasi, first edition-2008, page-5*
11. Alapati Vinod Kumar & Alapati Satya Prabha, *Compendium views on sroto sharira, chaukhambha orientalia, Varanasi, first edition-2008, page-19*
12. Alapati Vinod Kumar & Alapati Satya Prabha, *Compendium views on sroto sharira, chaukhambha orientalia, Varanasi, first edition-2008, page-34*
13. Alapati Vinod Kumar & Alapati Satya Prabha, *Compendium views on sroto sharira, chaukhambha orientalia, Varanasi, first edition-2008, page-37*
14. Paper published by Kamath Nagaraj et al. *UJAHM* 2014, 02 (01) *Critical analysis of Artavavaha Srotas WSR to its Moola.*

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