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 srotasas are dhamani. The normal functioning of the particular group of channels (srotanis) 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 physio-pathological 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 follicles. 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 energetic. 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 samushodhan 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 sthna 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). 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 body. 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 'siras'. 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 srotasas and the number of sira 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. 'dhananaddhamanyah'. 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 srotasas 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 raka from capillaries to heart, when we look into the references we find sira vedhana for raka 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 sirsas, it indicates that all the sirsas cannot be subjected to sira vedha, because some of the sirsas are more deep seated in the body and some of the sirsas may also carry prana in them like pulmonary veins which carry the oxygenated blood in it. Whereas sirsas 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.

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 moolasthana 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 driishtikon (moolasthan related with diagnostic point of view)
5) Chikitsatmak driishtikon (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 moolasthan8. Observation as per clinical point of view In this context, after keen observation it is clear that, the mulasthan 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 srotas9.

Susruta had used the word dhamanis to some of the moolasthanas of srotas, but he had not used any siras as the moolasthana of a srotas. It is sure that dhamanis can only act as moolasthana but not the sira because they carry deoxygenated blood and they are situated after the srotasas so they cannot become as moolasthanas of any srotasas. He had not considered dhamanis as moolasthas of the following srotasas, they are- udakavaha, medavaha, mutravaha, sukriver- ha 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 moolasthanas of these srotasas. But when we look as per the modern view the formation of moostra takes place by filtration from the capillaries only but still he had mentioned dhamanis which lie before these capillaries because the concept of moostra 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
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.

Charaka and vagbhatta had says that, the
mula of pranavaha srotas is hridaya and mahasrotas.

**Annavaha srotas** - the concept of annavaha 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 annavahini dhamanis.

**Rasavaha srotas** - According to charaka and vagbhata—the mula of Rasavaha 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 artheda-shamahamooliya 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 dhatus in the body so sushruta had considered this lakshana.

**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 dharmaniya as a root of raktavaha srotas. Yakrit and pliha both are most important organs of the body. They are soft organs, formed from the rakta, 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 dharmaniya. 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 mooola of mansavaha srotas is snayu (ligaments), twak (skin) and raktavahi dharmanis. Here, the carrier of muscle
tissue are two. Their root is snayu (nerves), twak (skin) and raktavahi dhamanis (blood capillaries). The nerve innervate the myo-
tome. 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 mansa vaha srotas.

Artavavaha srotas- Among the type of sro-
tas, artavavaha srotas (which does artava-
vaian) is given prime importance which is only present in females. The root of artava-
vaian srotas is considered as garbhashaya (uterus) and artavavahi dhamani (vessels carrying artava). Injury to artavavaha srotas leads to infertility, dysperunia and dysme-
norrhea. As per context artava can be consid-
ered as ovum and menstrual bleeding i.e. beejarupi artava and dristartava respective-
ly. Artava can be considered as ovum and menstrual bleeding i.e. beejarupi and dris-
tartava respectively. The beejarupi artava released from ovary reaches the garbha-
shaya and unites with sukrā 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, mula 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 garb-
hashaya is considered as one of the mula of artavavaha srotas. For a fruitful coitus pe-
riod rajasrava kala plays an important role which is due to vahan of artava through ar-
tavavaha dhamani, hence artavavaha dha-
mani is considered as the mula of artavava-
ha srotas

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 mula sthanas of any srotasas. Dhamanis is not considered as mula sthanas of the following srotasas, they are- udakava,
medavaha, mutravaha, sukhravaha 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.

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