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TO STUDY THE ROLE OF AYURVEDA AND MODERN ASPECTS OF DHAMANI SHARIR – A REVIEW

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ABSTRACT

Literature of Ayurveda contain a treasure of concepts. Many Ayurveda scholars and experts are continuously working on various concepts. Still the scope of research seems to be unending. Some topics have been studied lesser and *Kala Sharir* (membranous structures in body) is one of them. Though many people have worked a lot on this topic, we wanted to concentrate on the basic concept of *Raktadhara Kala* Ayurveda is a treasure trove of information developed and discovered by our forefathers. To fully comprehend and apply the concept of dhamani sharir, we must first understand Sharira. For students of any system of medicine, understanding of Rachana Sharira (anatomy) is required. Srotas, Siras, and Dhamani are terms from the Vedas. The terms Siras and Dhamani is referred to blood vessels in general. However, according to commentators, Dhamani is a thick blood vessel connecting to the heart, and sira is a thin blood vessel. According to Sushruta, ten Dhamani spread upward, ten downward, and four sideward emerging from the nabhi. According to Charak, hridaya produces ten Dhamani.

INTRODUCTION

Ayurveda is a treasure trove of information developed and discovered by our forefathers. To fully comprehend and apply the concept of dhamani sharir, we must first understand Sharira. For students of any system of medicine, understanding of Rachana Sharira (anatomy) is required. Acharya Sushruta has been referred to as the 'Father of Surgery.' He has placed a higher value on practical knowledge. Srotas, Siras, and Dhamani are terms from the Vedas. They've all been used in the same way, but they're all different. The terms Siras and Dhamanis can be traced back to the Vedas. They've both been used in the same context. These terms, however, are not interchangeable. The terms Siras and Dhamani is referred to blood vessels in general. However, according to commentators, Dhamani is a thick blood vessel connecting to the heart, and sira is a thin blood vessel. Both Sira and Dhamani are associated with the heart, yet their relationships are distinct. Many instances in the Sushrut Samhita use the word Dhamani, such as Moola of Srotas, Nabhinadi, and so on. The up-coursing Dhamaniprefers to maintain the body's integrity by performing particular body functions such as sound, touch, taste, smell, sneezing, laughter, speech, and so on. The Dhamanis that come down establish a pathway for Vata, urine, excrement, semen, and contained food to flow downward. Rasa is carried by Dhamanis all over their bodies and filled with air; it is significant that Rasa is only conveyed by Dhamanis. Dhamani in

Ancient Ayurvedic Texts Dhamani's etymological meaning is derived from the Sanskrit verb 'Dhamyatelti', which means 'to expand'. 'DhamanaatDhamanyaha'¹ says Charaka, 'the one who has the distinguishing traits of pulsation is Dhamani'. 'DhmanatPooranaatBaahyenaRasaadenetyart haha',² according to Chakrapani's commentary. 'Dhamani is the hollowed-out one that is filled with Rasadi'. It's important to understand the differences between the terms Dhamana and Poorana. As per the commentary of Chakrapani Dhamani does Poorana (fills) Karma, Srotas (capillaries) does the Poshana Karma and Sira (vein) does Deshantara Gamana³ karma (taking away from the site). According to Vagbhata, Sira, Dhamani, and Srotas are structures having lumen (Sharirachidra) ⁴. In Naadi Parisksha Vidhi (pulse examination), Sharangadhara used the term Dhamani, and the exact location was given, namely near the root of Kara Angushta (root of thumb). The Jeevasaakshi is the pulsatile function of these Naadis⁵. Origin of Dhamani Both Dhamani and sira are said to have originated in nabhi, according to Sushruta. The word nabhi has been employed in connection to foetal life in ayurvedic samhitas as charak Samhita, ashtanga sangraha, ashtanga hridaya etc. In the sutrasthan'

shonitavarniyaadhyaya,'Sushruta had changed his mind on the genesis of Dhamanis from nabhi to hridaya. Charaka has also mentioned in 30th chapter of sutrasthan that the Dhamani arise from the

hridaya. According to Sushruta, ten Dhamani spread upward, ten downward, and four sideward among the Dhamani emerging from the nabhi (transverse). According to Charak, hridaya produces ten Dhamani. According to ashtangasangraha sharira 6/9, there are twenty-four Dhamani; they provide nourishment to the entire body, similar to canals carrying water supplying nourishment to a vast plot of land; the nabhi is surrounded by them (Dhamani), just as an axle hole is surrounded by spokes (of a wheel); life is designed to dwell at that umbilicus (centre); thus, it is the seat of internal fire. Bhavprakash further stated that Dhamanis are twenty-four in number and are descended from nabhi (24). 10 spread upwards, ten below, and four in various directions from among them. These capillaries feature tiny openings through which Rasa (nutrients) flow, very similar to the pores found in the blossom stalk of a lotus flower 1) Dhamani is a hollow tube-like porous channel: Characterizing and specifying the structure of the Dhamanis, Maharshi Sushruta has said that as the lotus stem and its constituting components have natural pores (channels), similarly, the Dhamanis also have the pores through which Rasa (or chyle), Rakta (or blood) is carried out (and distributed in the body)7 . This above statement clearly speaks that the Dhamanis are porous structure like short and big lotus stem through which Rasa is carried out all over the body. In ancient treatise like Vedas, Upanishadas, Smiritis and Mahabharata, the term Dhamani used in the texts conveys the

meaning of artery. The etymological genesis of 'Dhamani' has been rightly given in Upodghata of Rasayogasangraha by Pt. HariprapannaShastriji. It is said that 'Which pulsate or performs throbbing movement, fulfils the requirement and nourish the body, is recognized as Dhamani. Hence, Dhamanis because of performing only throbbing flow function of Rasa (lymph chyle or plasma) of the body have been called to be a purified (oxygenated) blood carrying channel. 2) Dhamanis are attached to the Hridaya (heart): Though, 'Dhamanis' have been said to be 'Nabhiprabhava' (S.S.9/2) even then generally they are always stated to be attached with the Hridaya (heart)8,9,10. It is evident that both, the Hridaya (heart) and Nabhi (umbilicus) are quite separate and single organ situated in different regions of the body. The umbilicus is situated in the centre of the abdominal wall, through which the umbilical cord, consisting of both the Dhamanis (arteries) and 'Siras'(veins) keeps connected the fetus with the uterine wall of the mother and maintains the nutritional supply of the former, till its full-term growth and delivery. Because of this above-mentioned fact of nutritional supply during intra-uterine life of the foetus both the Dhamanis and 'Siras' have been stated to be Nabhiprabhava (related or having origin with the umbilicus or naval). 3) Dhamanis carry Rasa and Rakta both: Charak has rightly stated that the root of the RasavahaSrotas (channels for carrying the lymph chyle or plasma) is the Hridaya (heart) and the Rasa is carried out throughout the body by ten Dhamanis

Sushruta has also clearly expressed the relationship in between the Hridaya (heart), Dhamanis (arteries) and the Rakta (blood) along with their functional aspects of saturation of body tissues, nutritional supply, maintenances of growth and development, formation of milk in the breast, certain breast diseases found in younger and adult age of women and their periodical menstrual flow¹¹. 4) Dhamanis pulsate: Characterizing the 'Dhamanis', Srotasas and Siras Maharshi Charaka has distinctly differentiated that out of these three body channels, it is only the first one which constantly pulsate, till life is there¹². The applied aspects of 'Dhamanis' are of general importance in everyday today practice. Enlightening the clinical significance of 'Dhamanis' Sharangadhara has nicely stated that whether a person is living or dead and healthy or diseased, are decided by examining the pulse on the root of the thumb and it is always found to be rapid and warm during provocation of fever¹³. In short it can be said that the Dhamanis (arteries) described in Ayurveda represent a tubular channel taking origin from the Hridaya (heart) and possess the characteristics of pulsation and circulation of Rasa (lymph chyle or plasma) and Rakta (blood) throughout the body. Divisions of Dhamanis (arteries) and their functions: . Maharsi Sushruta has nicely stated that the Rasa (lymph chyle or plasma) situated in the Hridaya is carried out by twenty-four Dhamani, out of which ten go up and ten downwards and four obliquely and thus governed by destiny it keeps growing,

maintains and nourishes the entire body constantly day and night¹⁴. In Sharirsthana, the described functions of these twenty-four Dhamani taking origin from Nabhi' (umbilical region)¹⁵, though appears to be very much hypothetical, but when thought upon and critically analyzed on scientific basis, the approach stands substantial and meaningful. Yakrut and Pleeha are the locations of the Raktadhara Kala as well as it is the Mool Sthana of Raktavaha Strotasa. Study of histology of liver and spleen reveals that both organs are vascular. These organs have modified structures in their stroma to hold a large amount of blood. All the Dhamani also contain a large quantity of blood that is to be distributed to various organs of the body. Any injury to these organs can cause profuse bleeding.

Location of Raktadhara Kala is Sira, Yakrut, and Pleeha, whereas the Mool Sthana of Raktavaha

Strotasa is Yakrut, Pleeha, and Raktavahi Dhamanya. Inclusion or exclusion of Dhamani makes a big difference in the basic nature of the structure Kala or Strotasa. Acharya Sushrut has described the symptoms of injury of Raktavaha Strotasa (Viddha Lakshana) but he has not described it in case of Kala. Aforementioned observation can help us to infer that Kala is not a gross structure. It is an extensive but microscopic structure. We can consider the Viddha Lakshana of Raktadhara Kala as the Viddha Lakshana of Raktavaha

Strotasa with the reference of *ashray ashrayi sambandha* (the relation between the tissue and the organ that holds the tissue). Various diseases also can damage *Raktadhara Kala*.

To understand the difference of the *Kala* and the *Mool Sthana* of *Strotasa* described by *Acharya Sushrut*, we must consider the definition of *Sira* and *Dhamani* (blood vessels with pulsations). *Sira* are the vessels in which blood is propelled without any force, whereas blood is propelled forcefully in *Dhamani*. With this definition, we can consider veins as *Sira* but many arteries also can be included in *Sira*. The arteries in which force of blood has been reduced can be considered as *Sira*. We can consider capillaries, blood sinuses as *Sira* in the same way. We can correlate this easily with the help of histology of arteries.

If we observe the symptoms of rupture or injury to the *Kala* described by *Acharya Sushrut*, we can draw some inference about the organs that we are studying. He has used the example of milky plants to illustrate the nature of *Raktadhara Kala*. When a milky plant is scratched or injured superficially, milky exudate oozes out. The injury must be essentially superficial because if the plant has been excised completely, all the deeper tissues are damaged. In the same way, in case of superficial injury of skin, only superficial *Kala* is injured. Skin is supplied with blood capillaries richly. The walls of capillaries are made up of endothelial

layer only. The endothelial lining of the capillaries that holds blood can be considered as *Raktadhara Kala*. Superficial injury damages this *Kala* and bleeding occurs in the form of oozing. *Acharya Sushrut's* example seems to be perfect in case of superficial injury.

If the injury is deep, deeper tissues are damaged. Larger blood vessels are damaged. *Raktadhara Kala* along with the *Raktavaha Strotasa* is damaged. *Viddha Lakshana* of *Raktavaha Strotasa* are seen in deeper injuries. When the *Mool Sthana* of *Strotasa* is injured, the symptoms produced are of severe bleeding. For example, *Shyavangata* (darkening of the skin) can be seen in cyanosis or subcutaneous bleeding, that is, subcutaneous hematoma, *Panduta* (pallor skin). These symptoms are found in mild and moderate hemorrhagic shock.

The illustration used by *Acharya Sushrut* gives us a much clearer idea of *Raktadhara Kala*. He has used an example of *Kshiri vruksha* (a plant that produces milky exudates when injured). These *Kshiri vruksha*/milky plant start oozing when injured, same sort of oozing starts when skin is injured. Therefore, we can infer that, as the bleeding is very slow, it is not arterial bleeding because arterial bleeding is forceful. It can be venous or capillary bleeding. *Acharya Sushrut* in his first verse of *Raktadhara Kala* has said that the blood of this *Kala* is found in *Sira*, *Yakrut*, and *Pleeha*. It means that,

when *Raktadhara Kala* is injured, it can be interpreted as venous or capillary injury.

This excludes the possibility of considering arteries as *Sira* in case of *Raktadhara Kala*. *Dhamani* or arteries should not be included as the location of *Raktadhara Kala*. Many times, we tend to consider *Sira* and *Dhamani* as synonym but in case of *Raktadhara Kala*, *Sira* means arterioles, capillaries, and sinuses in liver and spleen.

Another reason for considering the bleeding from *Raktadhara Kala* as venous bleeding is because anatomically veins are superficial than arteries. A superficial wound can cause a vein to bleed. There a possibility of venous bleeding in superficial injury. When an artery is ruptured, the bleeding is forceful and profuse.

Acharya Sushrut has given a simile of exudates of milky plants. These exudates, which occur on an injury to the plant, are not forceful. The white juice oozes out slowly. Similarly, when an injury to the skin does not cause forceful bleeding, we can interpret that the damage is up to *Raktadhara Kala* only. This way we can determine the *Sthana* (location) of *Raktadhara Kala*.

The symptoms of an injury to the *Raktavaha Strotasa* include discoloration of the skin. *Acharya Sushrut* has described *Shyavangata* and *Panduta* as the symptoms of the injury to

the *Raktavaha Strotasa*, which can be interpreted as cyanosis and pallor. Both the symptoms can be seen in case of severe blood loss. He has not included *Dhamani* in the location of *Raktadhara Kala*. He has included it in the location of *Mamsadhara Kala* and in *Mool Sthana* of *Raktavaha Strotasa*. Hence, we must be careful about the exclusion of *Dhamani* from the *Sthana* of *Raktadhara Kala*.

This study helps us to find a correlation between *Raktadhara Kala* and various tissues concerned with it. It can provide us an Ayurvedic approach toward the diseases of liver, spleen, and blood vessels. Ayurveda has a well-defined method of pathophysiology and treatment of various ailments. This study can extend a small help to the Ayurvedic physicians.

This study is a literary type of study only. The approach of this study is to reveal the basic concept of *Acharya Sushrut's Sutra*. The concept can be studied further in rats for histological study. The study can be further extended in the form of original study, in patients with the diseases of liver, spleen, or blood vessels.

Raktadhara Kala is found to have a close resemblance with endothelial tissue that lines the blood vessels internally. Endothelium lines the sinuses of liver also. Sinuses are the major part of the liver substance.

Diseases of the liver and the spleen could be treated considering its relations

with *Rakta Dhatu*, *Raktavaha Strotasa*, and the *Raktadhara Kala*. We need to study the *Shloka* (verse) described by Acharya Sushrut thoroughly before jumping into any conclusion. The *Sutra* has been studied for its grammatical part in the first stage. Later, various *Samhitas* have been studied for detailed knowledge. Histology of all the types of blood vessels, liver, and spleen was studied to find out any similarity between the characteristics of the *Kala* and the tissues. This is an attempt of analysis of Acharya Sushrut's *Sutra* about *Raktadhara Kala* for this purpose. *Kala* is a very subtle structure. Abnormality in *Kala* will lead to diseases. Acharya Sushrut has described the normal structure of *Kala*. With the help of the study, it can be concluded that *Kala* is a localized structure as in case of liver and spleen. It is a widespread generalized structure also and can be considered as microscopic internal lining of blood vessels, which are said to be the *Sthana* (location) of the *Kala*. Diseases of spleen and liver are increasing all over the world. This study can give a new approach to the treatment of these diseases.

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