

## ANATOMICAL CONSIDERATION ON DHAMANI IN AYURVEDA WITH SPECIAL REFERENCE TO SUSRUTA SAMHITA

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### Abstract

The term siras and dhamanis are as old as vedas. They have been generally used in the same sense. But these are not synonymous. In general, siras and dhamanis means blood vessels. But on the basis of interpretation of commentators dhamani is a channel connected to the heart which is thick whereas sira is a thin blood vessel. Sira and dhamani both are related to heart, but their relations are different. In relation to dhamani, hridaya is ashraya (abode). Ashraya is those structures which provide base, nutrition and protection to their ashrayi (shelters). Heart is place of ojus, so dhamani which carry ojus are called as ojevaha dhamani. Heart is also place of prana, so dhamani are also pranavaha. Due to place of rasa, dhamanis are rasavahini. Heart is the place of contraction and relaxation, so contraction and relaxation also received by dhamani. Thus dhamanis are ashrita (depends) on heart for ojus, prana, rasa, spandana etc. although siras are also related to heart but they do not receive any significant things from heart, sira only drain their blood into the heart.

**Keywords:** Dhamani; Sira; Srotas; Urdhwaga; Adhoga; Tiryaga; Ayurveda.

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## INTRODUCTION

Ayurveda is that science, which imports all the knowledge of life. Life is the combination of four factors sharira, indriya, satva and atma.<sup>[1]</sup> Thorough structural scientific knowledge of the life was recommended by ancient acharyas. The knowledge of Rachana Sharira is mandatory for the students of any system of medicine. It is a vital subject in pre-clinical studies. The Atharva veda refers to dhamanis- which are ducts with thick walls equivalent to arteries; siras- which are ducts with thin walls equivalent to veins and still finer ducts are referred to as snavas similar to capillaries. However some misconceptions existed and the vedic scholars considered nerves also as hollow tubes or ducts which are quite far from reality. Originally, the ancient Greeks believed that arteries only held air. This was because, in the absence of a heartbeat, the arteries of the dead were empty. In the middle ages it was believed that arteries carried vital spirits, separate and different from blood. It wasn't until the seventeenth century that William Harvey described the circulatory system as we know it. Acharya sushruta has said to be the father of surgery because of description available in sushruta samhita regarding methodology for learning of the anatomy, dissection on cadaver, dhamani, sira, marma, management of fractures, different surgical procedures etc. He has given more emphasis on the practical knowledge. A surgeon who desires to obtain thorough knowledge of the body must dissect a dead body properly and see each and every structure and organ in it.<sup>[2]</sup> Ayurvedic acharyas has used an anatomical term dhamani, which is one of the controversial terms (structure), used to represents tubular structure, to carry sabda, sparsa, rupa, rasa and gandha and it is one of the synonyms of srotas.

Modern science describes blood vessels of three types' viz-artery, vein & capillaries. The other two important channels for the maintenance of the body are lymphatics &

nerves. The relevant terms in ayurvedic language are sira, dhamani and srotas and in these three terms the modern five structures namely artery, vein, capillary lymphatic and nerve are incorporated. Many times controversies or differences in opinions had been raised due to the two types of commentators. One who had performed the dissection and seen the structures and having profound knowledge then commented the terms, they had not left any chance for controversies. Others who had not performed the dissection but commented the terms on the basis of knowledge of Sanskrita and other literature and using the synonyms of the terms like sira, dhamani and srotas. They had left many chances for controversies. The terms sira, dhamani and srotas are as old as the Vedas. They have been used loosely in common parlance through ignorance of their specific meanings. The statement of Amarkosh "Nadi tu dhamanir sira" stands on this wrong basis. Unfortunately this has been followed by many commentators, the words dhamani and sira are synonym,<sup>[3]</sup> it has been admitted by some ayurvedic acharyas, but sushruta has differentiated them on anatomical basis. Sushruta's concept of dhamani is specifically unique.

### Concept of dhamani

The Atharvaveda refers to dhamanis- which are ducts with thick walls equivalent to arteries; siras- which are ducts with thin walls equivalent to veins and still finer ducts are referred to as snavas similar to capillaries. Acharya charak starts from the root meaning of dhamani. Dhamani term is derived from the root 'Dhma' (Dhamani + Va Digha). Dhamani is pipe or tubular vessels or canal of the human body starting from heart or from the naval on supported to carry the rasa. According to charak 'Dhamanadhamanyah' hence dhamani is that tract which produces sound.<sup>[4]</sup> According to sushruta, sira & dhamani are the channels other than srotas.<sup>[5]</sup>

## Origin & division of Dhamani

According to sushruta nabhi is the site of origin of both dhamani and sira.<sup>[6]</sup> Even in charak, astanga sangraha and astanga hridaya, nabhi word has been used in reference to fetal life. Sushruta has himself shifted from his own view in relation to the origin of dhamanis from nabhi to hridaya in sutrasthan 'sonitavarniya adhyaya'.<sup>[7]</sup> Charaka has also mentioned in 30th chapter of sutrasthan that the dhamanis arise from the hridaya.<sup>[8]</sup>

According to sushruta, among the dhamani arising from the nabhi, ten spread upward, ten downward and four sideward (transverse).<sup>[9]</sup> Charak said that 10 dhamani arises from hridaya.<sup>[10]</sup> In astang sangraha sharira 6/9, it is said that dhamani are twenty four; by them the entire body gets supplied with nourishment similar to a vast plot of land by canals carrying water; from them (dhamani) the nabhi is surrounded just as a axle hole is surrounded by the spokes (of wheel); at that umbilicus (centre) life is designed to dwell; hence it is seat of internal fire.<sup>[11]</sup> Bhavprakash also said that dhamanis are originated from nabhi and are twenty four in number (24). From among them, ten spread upwards, ten downwards and four in different directions. These vessels have got minute outlets, through which rasa (nutrients) move in entirely similar to the flower stalk of lotus where pores are present naturally.

## Urdhvaga dhamani

Those dhamanis spreading upward, support (maintain) the body by attending to functions such as receiving sensation of sound, touch, sight, taste and smell; inspiration, expiration, yawning, sneezing, laughing, talking g, shouting and such other functions. These dhamanis, after reaching the hridaya each one divides into three, thus becoming thirty. Out of these, two each carry vata, pitta, kapha, sonita and rasa- thus ten; two each carry sensations sound, sight, taste and smell – thus

eight; two attend to speaking (in words), two attend to shouting (loud sound without words), two attend to sleep, and two to waking, two carry tears (in the eyes), two carry breast milk in the breasts of women, these only carry sukra from the breast in men – thus thirty (dhamani) are described by their divisions. By these dhamanis parts of the body above the umbilicus, such as the abdomen, flanks, back, chest, shoulders, neck, arms etc. are supported and maintained. The upward dhamani perform all these functions always (throughout life).<sup>[12]</sup>

## Adhoga dhamani

Dhamanis spreading downward purvey flatus, faces, semen, and menstrual blood etc downward. These, on reaching the pittashaya acting upon the essence of foods and drinks produce by the heat separates it into sara (essence) and kitta (waste); purveys it throughout the body and nourish the body supplying nutrient materials present in the essence of food supply it (the essence of food) to the dhamani spreading in upward and transverse direction, fill the seat of rasa (hridaya) and separate urine, faeces and sweat (from the rasa). In between the amashaya and pakvashaya, each one of these divides into three branches thus becoming thirty; out of these, two each carry vata, pitta, kapha, sonita and rasa thus ten; two present in the intestine purvey anna, two carry toya (water produce during digestion), two present in the bladder carry urine, two are meant for production of sukra in the testes, and two meant for its elimination, these only purvey the blood known as artava in women and eliminate it; two attached to the large intestine are for expelling the faeces; another eight dhamani supply sweat to those (dhamani) spreading transversely; thus the thirty branches are described. By these dhamanis, the parts of the body below the umbilicus such as large intestines, pelvis, organs of urine (bladder), faeces (rectum), anus, bladder, penis and legs are supported and maintained. Dhamani

spreading downward perform these functions all the time (throughout life).<sup>[13]</sup>

### Tiryagga dhamani

Each one of the four dhamani spreading sideward/transversely divide into hundred and thousand of branches further and so becomes innumerable; by these, the entire body appears to be full of windows; these knit together broadly, their mouths (openings) are attached to the hair follicles; these purvey sweda and rasa both inside and outside; through these only the potency (effect) of materials (medicines) used in the form of anointing, pouring liquids on the body and application of pastes, get cooked (processed by heat) in the skin, enter into the interior of the body. The sensation of touch both comfortable and uncomfortable, are perceived (understood) by these only. Thus were described the four dhamani along with their branches, spread throughout the body.<sup>[14]</sup>

### MATERIAL AND METHODS

The present study depends on the data collected from the ayurveda samhitas and modern books, national and international journals, magazines, conferences, internet materials, previous work done, presented papers etc, critically evaluated and important information will be sought to approach the objectives scientifically.

### DISCUSSION

Ayurveda, a hidden abode of basic concepts and treatment aspects had suffered with many hurdles in its progress and not communicated properly since few centuries. An extensive description about dhamani is available in ayurvedic literature but the correlative interpretation and applied aspect of dhamani with latest up to date modern parameters is not available. The advancing age of information technology demands the classical ancient Ayurveda to be communicated, interpreted

and correlated in term of exciting knowledge for international debate. The basic ideology of Ayurvedic treatment with the recent and sophisticated improvements in contemporary science like investigative methods may answer the unsolved question in neurology and angiology. The term dhamani, in one place reflects a meaning of blood vessels while at other place, it means nerve. In such condition it is very difficult to know doubtlessly about it like modern anatomy. Therefore, it requires great research work to establish a clear concept of dhamani in ayurveda.

It has been started earlier (in chap. 14. of sutra sthana) that there are twenty-four dhamani, arising from the hridaya.<sup>[15]</sup> On that, some scholars say sira, dhamani and srotas are not different, and dhamani and srotas are the vikara (modifications) of sira only.<sup>[16]</sup> This view is not correct, dhamani and srotas are different from sira. How? It is so because of vyanajananyatva (difference in their features), mulasanniyama (difference in number at their place of origin), karma vaisesya (function special to each) and agama (description in scriptures – treatises of Ayurveda).<sup>[17]</sup> Dalhana explains these reasons as follows;

### Reasons of difference

#### 1. Difference in features

sira (veins) carrying vata, pitta, kapha and rakta are described as light red, blue, white and (deep) red in color respectively, whereas, dhamani are described as having no color and srotas as having the same color of the dhatu (tissues) in which they are present.

#### 2. Number at origin

At their site of origin (the umbilicus) sira are described as forty in number, whereas dhamani are twenty four and srotas are twenty two.

### 3. Special functions

Performing all the functions of the body, mind and intellect without any hindrance (interruption) is the function of the sira, whereas functions of dhamani are perception of object of senses (such as sound, light, taste, smell and touch) and those of srotas are purveying air, water, food, rasa etc.

### 4. Description in texts

Treatises of Ayurveda have mentioned sira, dhamani and srotas separately at many places. Hence dhamani and srotas are different from sira.

### Reasons for confusion

Identifying these as one and the same are due to sannikarsa (nearness), sadrisagamatva (similarity of description in texts), sadrisa karmatva (similarity of functions) and sauksmya (minuteness)-these though actually performing different functions yet appear to be not different (in other words appear to be one and the same).

1. Nearness - as for e.g., burning of blades of grass placed nearer to one another though burning separately, yet appear as though all are burning together.
2. Similarity of description in texts- as for example – the statement that vacant places, sira, dhamani, srotas, marga etc. all belong to akashabhuta group since there is space inside them.
3. Similarity of functions- for example-melody of each member of an orchestra though different individually, still appears to be one when combined together.
4. Minuteness- though each one of the innumerable atoms of mud present in a pot are supporting the water in the pot, still they are not recognized separately.

The examples given by Dalhana above are of a general nature and not very scientific. These four reasons can be explained better as- veins and arteries along with their branches are found side by side closely, in all the parts of the body; the statements of authorities that veins, arteries, channels are identical is because all these are hollow tubes; similarity of function- veins and arteries are passages of circulation of rasa-rakta (blood) while tissue channels divide themselves into minute branches, some of which are invisible and are present side by side. By these reasons these structures may not be distinguished easily.

Sushruta has used the word "nabhiprabhava" only because during intra uterine life the vessels like umbilical arteries and umbilical veins start from the fetal umbilicus. Therefore, one can accept this statement in relation to fetal life. Even in charak, astanga sangraha and astanga hridaya, nabhi word has been used in reference to fetal life.

Apparent similarity between the functions of dhamani (arteries) and nerves is because these functions are interdependent and supplementary to one another. Functions of nerves will not be effective in any part of the body if that part is not supplied with blood by the arteries. For example when the eye, (specially its retina) is not supplied with blood, then vision will be hampered or lost though nerve impulse is present; similarly so with all sense organs, viscera such as larynx, stomach, intestines, urinary bladder, rectum, uterus etc and tissues likes muscles etc. for every function of the body arteries supplying blood and nerves supplying the stimulation to act, both are equally important and any one only will be useless.

Sushruta has given greater emphasis to dhamanis (arteries) and attributed all the functions to these purvey the three doshas also, along with rasa dhatu.

## CONCLUSION

The dhamani have throbbing that indicates the presence of life, it also indicates health and ill health. When, throbbing stops we judge that the heart has stopped functioning and body is declared dead. The nervous tissue, more than any other tissue of the body, depends for its normal functioning on the continuous supply of arterial blood. Whenever, the volume of blood circulating in the brain is reduced for even a short time unconsciousness results. The nerve cells suffer irreversible damage if the blood flow remains insufficient for too long, the time 'measured \in minutes. Consequently disturbance in the blood supply of brain tissue and the lesions resulting there from constitute a large part of the pathology of the brain. In a tissue whose activity depends so much upon its blood supply, the micro-anatomical relations between the cells and the blood vessels are of particular interest.

The materials used in the form of liquid or pastes on the surface of body enter into the interior of the body through these dhamani. Comfortable and uncomfortable touches are perceived by dhamani. The dhamani are panchabhoutika, which help establish, contact between the sense organs and their respective objects throughout the life. Such contact happens in each sense organ separately. This contact ceases at the time of death of body. With these features contrary to those of those arteries, equating dhamani with nerve is untenable. Apparent similarity between the functions of dhamanis (arteries) and nerves is because these functions are interdependent and supplementary to one another. Functions of nerves will not be effective in any part of the body if that part is not supplied with blood by the arteries.

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