

The Anatomical and Physiological Perspectives of Siras and Dhamanis; Differences, Similarities and Related Disease

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REVIEW ARTICLE

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ABSTRACT

Ayurveda is considered as traditional science of healing and well-being since it described many theories to remain healthy and free from disease conditions. Ayurveda described all aspects related to the anatomical and physiological functioning of body and in this regards Ayurveda also elaborated concepts of vessels that carry fluids from one place to another. The vein and artery are important vessels of body that carry bloods from one place to another Ayurveda also mentioned terms Siras and Dhamanis for vein and artery respectively. Dhamani is considered as thick vessels while Sira is considered as thin blood vessel. There are significant anatomical and physiological difference between Sira and Dhamani and understanding of these differences is very important for clinical point of view. Considering this concept present article explored anatomical and physiological considerations related to vein and artery.

Keywords: Ayurveda, Siras, Dhamanis, Vein, Artery.

1. Introduction

Ayurveda described four factors i.e; *Sharira*, *Indriya*, *Satva* and *Atma* as basis of physical, mental and spiritual health. The knowledge of *Rachana Sharira* is very essential for the clinical management of health related issue. Initially the ancient scholar proposed that arteries only carry air later on it was belied that arteries carry some important fluid. Finally during the time of seventeenth century the circulatory system understood and elaborated correctly. (1-4) The Ayurveda mentioned *Dhamani* as tubular structure which carry *Sabda*, *Rupa*, *Sparsa* and *Rasa*. **Figure 1** depicted circulatory process for blood supply from tissue to heart and *vice-versa* through *Dhamani* & *Sira*.

The word *Sira* initially derived from term *Hira* that further explained as blood carrying channel. Ayurveda *Acharyas* considered *Sira* as *Srotas* since it carry *Rasa* & *Rakta* like *Srotas*. *Sushruta* discussed differences amongst *Sira*, *Dhamani* and *Srotas* on the basis of structural and functional features.

Dhamanis is considered as thick ducts while *Siras* is considered as thin walls ducts. (3-5)

Sushruta described about 700 *Siras* while 200 *Dhamanis*, somewhere *Sushruta* has mentioned *Dhamanis* as *Srotas Mula Sthanas* however *Sushruta* had not mentioned *Siras* as *Srotas Mula Sthana*.

The understanding about anatomical and functional difference between *Dhamanis* and *Siras* helps physician to perform correct surgical intervention and diagnosis of disorders related to the circulatory system. (5-7) Present article described physiological and anatomical perspective of *Dhamanis* and *Siras* in a view to explore their clinical importance.

2. Origin Dhamani & Sira

Dhamanis can be referring as ducts equivalent to arteries having thick walls structurally it is tubular vessels starting from heart and carry *Rasa*. As per *Sushruta*, *Nabhi* is considered the origin site of origin for *Dhamani*.

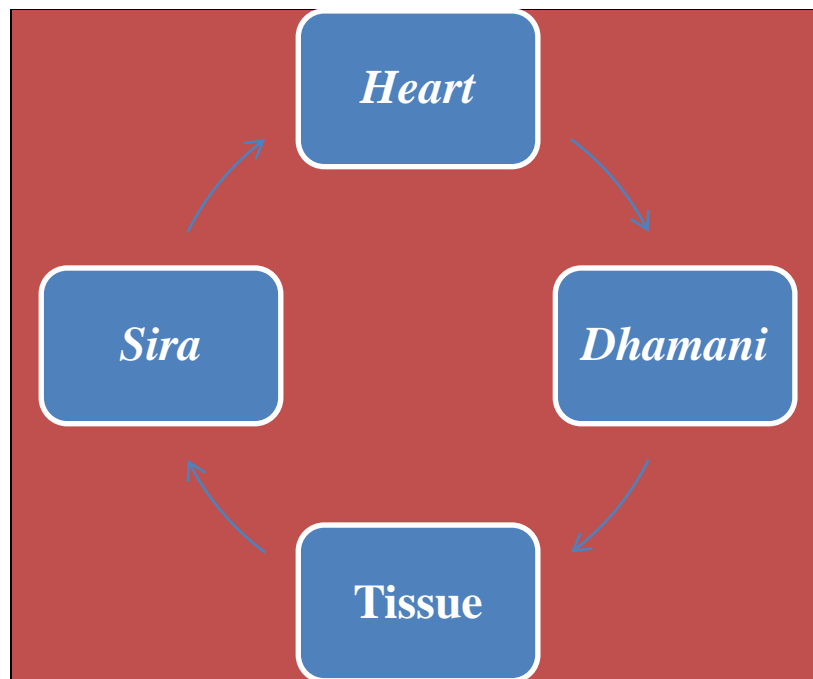


Figure 1. Supply of blood from through *Dhamani* & *Sira*

Sira can be referring as ducts equivalent to vein having thin walls structurally it is tubular vessels moves towards heart and carry impure *Rasa*. Some texts considered *Nabhi* while some considered *Hridaya* as origin site of *Dhamani*.

At the site of origin *Sira* are 40 in number while *Dhamani* are 24 at the site of their origin.

3. Spread and types of *Dhamani* & *Sira*

As per *Sushruta*, *Dhamani* spread upward, downward and sideward after their origin. As per *Astang Sangraha* and *Bhavprakash* there are 24 *Dhamani*

4. Features of *Dhamani* & *Sira*

Sira carry *Vata* possess light red colour while *Pitta* carrying *Sira* having blue colour while *Kapha* and *Rakta* carrying *Sira* possess white and deep red color respectively.

Dhamani described as without color like *Srotas* it offers color of the *Dhatu* which is carried by them.

5. Functional difference

Dhamani (artery) mainly carry pure or oxygenated blood while *Sira* (vein) carry impure deoxygenated blood.

The movement of fluid carried by *Sira* mainly from organs to heart while fluid carried by *Dhamani* moves from heart to organs.

Sira possess properties to contract and dilate, they supply nutrients to body while *Dhamanis* possess pulsating property and supply pure blood to body while *Srotas* carry fluid, food and other materials.

6. Relation with channels of circulation

The *Sira* different in colour depending upon fluids that they carry but no such differentiation mentioned for *Dhaminis* and *Srotas*.

With regards to *Mulasanniyamat* there are 40 *Siras*, 24 *Dhamanis* and 22 *Srotas* in numbers.

Sira mainly associated with all functioning of body, mind and intellect while *Dhamani* mainly relates with functioning of perception; senses (sound, taste, smell, touch and light) while *Srotas* related with transportation of air, water and other materials.

7. Some common similarities between *Dhamani* & *Sira*

- *Sira* and *Dhamani* found in close proximity of human body.
- Both are structurally same; hollow inside, duct like and long vessels.

- Perform functioning of transportation, both carry fluid mainly *Rasa*.
- *Sira* and *Dhamani* majorly related with heart in terms of their origin and termination.
- They are composed by *Akash Mahabhuta* (space or ether) and possess many anatomical similarities.
- *Sira* and *Dhamani* all minute in nature acts like channels.

8. Distribution

Dhamanis spreads upward and help in sensation perception for sound, sight, touch, taste and smell. Some are above the umbilicus at abdomen, back, flanks, chest, neck, shoulders and arms etc.

Siras originate during embryonic life, spread upward and downward during embryonic life, attached to umbilicus during fetus life for nutritional supply of the foetus through the umbilical cord.

9. Structures of *Dhamani* & *Sira*

Siras are fiber like as leaf of tree and look more finely towards the end. The coming from tissues as unite capillaries “venules” later form larger veins that return blood to the heart.

Arteries coming from heart and branched into smaller ones reaches to the parts of body and divided into vessels which are smaller one called arterioles. Inside the tissues these arterioles forms microscopic capillaries.

The walls of arteries and veins mainly consisted of three coats however they differ in thickness. Generally the arteries possess thicker inner or middle coats as compared to veins. This thickness support arteries when they carry pulsating blood from heart. The more elasticity and expanding capacity of arteries than vein offers advantages to carry blood that coming from beating heart. The veins possess more flexible walls therefore they can contract easily to returns blood to the heart.

10. Diseases related to *Dhamani* & *Sira*

- ❖ *Mamsa Kshaya* can lead *Dhamani Shaitilya*.

- ❖ *Dhamani Praticahya* is another pathological condition that may considered as *Shleshmaja Nanatmaja Vikara*.
- ❖ *Dhamani Spandana* as symptoms of *Vata Prakopaka*
- ❖ *Sira Snaayu* as symptoms of *Vata Prakopaka*
- ❖ *Avarana* (blockage) of *Dhamani* & *Sira*.
- ❖ Entry of *Vrudda Vata* can lead *Urdhvaga* and *Adhoga Dhamani* that further causes other complications.
- ❖ *Vrudda Dosha* can enters to *Pradhana Dhamani* along with *Shonita* to produces disease like; *Arshas*.
- ❖ *Pandu* and *Visarpa Roga* occur when *Prakupita Dosha* enters to the *Dhamani* and induces other complications. (6-10)

11. Conclusion

Dhamani carry *Prana* (life) and dysfunctions of *Dhamani* can lead ill health. The tissues of body merely depend upon supply of arterial blood for their normal functioning therefore arteries play key role towards the normal physiological functioning of body. *Dhamani* helps to receive sense perception such as; sound, smell, taste and touch, etc.

The *Sira* means vessels in this regards *Pittavaha Siras* can be considered as veins, *Kaphavaha Siras* resembled lymphatic channels and *Raktavaha Siras* can be considered as capillaries. *Sira* possess carry fluid, food and other materials, it mainly supply impure blood from tissue to heart for purification purpose.

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Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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