

Interpretation of Sira As per Modern Anatomy

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ABSTRACT: While learning Anatomy with Ayurvedic perspective, students encounter number of controversial concepts which has to be clarified e.g. *Srotas, Snayu, Sira, Kala*etc.

Sira is one of the intricate, controversial but essential concepts that have to be understood. Hence to understand about concept of *Sira*, it becomes necessary for a scholar to understand what actually *Sira* means.

We have gone through the description given by *Sushruta* in detail regarding their *Karya, Prakara* etc. and it is observed that *Karya of Sira* is nourishment which is as like that of vessels and types Of *Sira* matches more with Artery, Vein, Capillary, Lymph Vessels. Hence we can correlate *Sira* with vessels.

KEYWORDS: *Sira*, Types of *Sira*, Vessels.

INTRODUCTION: *Ayurveda* is very ancient medical science. At that time, the method of dissection followed by the *Sushruta* was entirely different from method of dissection which is followed today. Further, the structures explained by *Sushruta* had a physiological base and hence many of these structures explained are not clear to us. To understand these structures, the concept of correlation began, which lead to many controversies. *Sushruta* has stated number of various structures in the body like *Sira, Snayu, Asthi, Sandhi* etc. and have also explained their importance and different pathological conditions in different *Sthana* of *Samhita*. Hence to understand clearly the pathological conditions, the concept regarding the structure should be clear.(But for their understanding for practioner / students the knowledge of anatomy is essential.)

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Hence to understand about concept of *Sira*, it becomes necessary for a scholar to understand what actually *Sira* means.

We have gone through the description given by *Sushruta* in detail regarding their *Karya, Prakara* etc. and it is observed that, Types of *Sira* matches more with Artery, Vein, Capillary, Lymph Vessels.

AIM: To study the concept of *Sira*.

OBJECTIVES: 1.To collect detailed literature about *Sira* from various *Samhitas*.

2.To correlate *Sira*and its types with modern anatomical structures.

MATIIRALS:

1. Comparison of *karya of Sira* with Functions of modern anatomical structures.
2. Correlation of *Sutokta Types of Sira* with modern anotomical structures.

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1. Comparision of *karya of Sira* with Functions of modern anatomical structures. :

i) Function of Sira:The body is nourished by 700 Sira like garden by water-carriers and like field by irrigating channels and also benefitted with activities such as contraction, extension etc. Their ramifications are as venation in a leaf; their root is umbilicus where from they spread upwards, downwards and obliquely.¹

ii) Function of Vessels:According to modern science, there are many tubule like structures in human body called as vessels (artery, vein, capillary and lymphatics). These vessels nourish the body. (The nutrients, oxygen, hormones, etc. are carried out throughout the body by cardiovascular system through vessels².)

2. Correlation of Sushrutokta Types of Sira with modern anatomical structures:

i) Types of Sira:Sira are classified into 4 types according to *Dosha*.

1. *Vatavahi*
2. *Pittavahi*
3. *Kaphavahi*
4. *Raktavahi*

Vatavahi Sira (Aruna) are blackish red in colour and filled with *Vata*, *Pittavahi Sira (Neela)* are warm and blue in colour, *Kaphavahi Sira (Gauri)* are cold, white and stable, *Raktavahi Sira (Rohini)* are red in colour and neither very hot nor very cold³.

ii) Types of Vessels: There are 4 types of vessels:

Arteries - These are Brick red in colour⁴, having thick walls and run from heart to other parts of the body, carrying oxygenated blood⁵.

Veins – These are Blue in colour⁴ with thin walls and run towards heart from other parts of the body, carrying deoxygenated blood⁶.

Capillaries - Blackish red in colour⁷, having thin walls and run towards heart carrying deoxygenated blood⁸.

Lymphatics - White/colourless, having thin walls and run towards heart, carrying lymph.⁹

Comparison of types of Sira³ with types of vessels (On the basis of colour)^{4,7,9}:

S.N.	Ayurveda	Modern
1	<i>Aruna (Vatavahi)</i>	Capillary
	Convey <i>Vatadosha</i> . <u>Blackish red in colour</u> . Minute, if pressed suddenly get emptied and after removing pressure suddenly fill.	Convey deoxygenated blood. <u>Blackish red</u> in appearance. Minute, if pressed suddenly emptied and after removing pressure suddenly fill.
2	<i>Neela (Pittavahi)</i>	Vein
	Convey <i>Pitta dosha</i> . <u>Blue</u> in appearance and are warm.	Convey deoxygenated blood. <u>Blue</u> in appearance.
3	<i>Gauri (Kaphavahi)</i>	Lymph vessel
	Convey <i>Kaphadosha</i> . <u>White</u> in colour. Steady, sheet and nutritive.	Convey lymph. <u>White</u> or colourless. They are nutritive, cold and beaded.
4	<i>Rohini (Raktavahi)</i>	Artery
	Convey <i>Suddha Rakta</i> . <u>Red</u> in colour. Neither warm nor cold.	Convey oxygenated blood and nutritive. <u>Red</u> in appearance.

OBSERVATIONS

1. Observations based on Comparison of *karya* of *Sira* with Functions of vessels.

According to *Ayurveda*, *Sira* nourishes the body¹ and as per the modern science body is nourished by blood vessels and lymphatics.²

Hence we can correlate the *Sira* with the blood vessels and Lymphatics.

2. Observations based on Comparison of Types Of *Sira* with Types of Vessels:

On the basis of colour, types of *Sira* can be correlated with the following types of vessels.^{4,7,9}

1. *Aruna Sira* can be correlated with Capillaries.
2. *Neela Sira* can be correlated with Veins.
3. *Gauri Sira* can be correlated with Lymph vessels.
4. *Rohini Sira* can be correlated with Arteries.
- 5.

DISCUSSIONS:

Comparison between *Sira* and vessels:

According to *Charakavand Vagbhata*, *moolasthan* of *Sira* is *Hrudya*^{10,11}

Charaka stated that *Moola Sira* are ten in number, which called as *Mahamula* and they originating from *Hrudya* conveying *Oja* all over the body¹⁰. According to *Vagbhata* also *Moola Sira* are ten in number. They are originating from *Hrudya*, spread all over the body. It conveys *rasrupOjadhatu* all over body¹¹.

As per modern anatomy, main arteries and veins are originated from heart¹². Thus arteries and veins can be considered as *Sira* and heart i.e. *Hrudya* as their *moolasthan*.

Thus with above support we have considered *Sira* as vessels.

According to *Sushruta*, the *moolasthan* of *Sira* is *Nabhi*¹³. In the 7th chapter of *Sharirsthan Sushruta* said that, *Sira* originating from umbilicus spread and pervade all around in the body as branches of stem etc. from the lotus stock spread in water¹⁴. According to modern, the arteries and veins are not originating from umbilicus, so here a controversy arises regarding consideration of *Sira* as vessels on the basis of origin.

But this controversy can be resolved by considering the function, distributions and types of *Sira* stated by *Sushruta* which are similar with that of vessels.

For this, we went through references regarding functions, distributions and types of *Sira*.

A) Function of *Sira* and vessels:

As stated in *Sushruta Samhita*, the body is nourished by *Sira*

(The body is nourished by 700 *Sira* like garden by water-carriers and like field by irrigating channels and also benefitted with activities such as contraction, extension etc.)¹³

As per modern anatomy nourishment of body is through blood vessels and lymphatics.

(The nutrients, oxygen, hormones, etc. are carried out throughout the body by cardiovascular system through vessels¹⁵.)

Therefore on the basis of similarity in function i.e. nourishment *Sira* are considered as vessels.

B) On the basis of distribution of *Sira* and vessels:

Sushruta stated that the ramifications of *Sira* are like venation in a leaf, their root is at umbilicus from that site they spread upwards, downwards and obliquely¹³. According to him *Mool Siracarringdosha* are 40 i.e. *Vatavahi*, *Pittavahi*, *Kaphavahi*, *Raktavahi* –each 10 in number. These *Sira* run in their particular *sthana* and each divided and redivided into 175 branches. Therefore total *Sira* are 700¹⁸. According to *AshtangSangraha* and *AshtangHrudya*, ten *Mool Sira* (root veins) which are connected to the heart, transport *Oja* to all the major and minor parts of body.¹⁶ They are

big at their roots and very small at their tips and appear like the lines of leaf (net like). Thus after division, they become seven hundred (in number)¹⁷.

In modern anatomy, vessels are of 4 types -these are arteries, veins, capillaries and lymph vessels. These vessels are either going away from heart or coming towards heart i.e. branches of arteries increase in number from root to the periphery and veins and lymph vessels decrease in number towards heart. According to this science, from the center to the periphery, the arteries increase in number by repeated bifurcation and by sending out side branches, in both the systemic and the pulmonary circulation¹⁹.

By observing this scenario of description regarding vessels and *Sira* with modern and *Ayurvedic* perspective, one can say that the ramifications of *Sira* are like venations in a leaf which can be structurally correlated with the distribution of branches of vessels.

C) Types of *Sira* and vessels:

While going through the details regarding types of *Sira* and vessels, it is observed that the colour of *Aruna*, *Neela*, *Gauri* and *Rohini Sira*²⁰ matches with the colour of Capillaries, Veins, Lymph vessels and Arteries respectively^{21,22,23} as -

- a) 4 types of *Sira*²¹: 1. *Aruna -Vatavahi-* Blackish red in colour
 2. *Neela -Pittavahi-* Blue in colour
 3. *Gauri -Kaphavahi-* White or colourless
 4. *Rohini -Raktavahi-* Red in colour
- b) 4 types of vessels: 1. Capillaries - Blackish red in colour
 2. Veins - Blue in colour
 3. Lymph vessels -White or colourless
 4. Arteries -Red in colour.

The conclusion of one of the previous studies by Dr. M. S. Dhotre²⁴ is supportive to above consideration about types of *Sira* and vessels. (Types of *Sira* i.e. *Aruna*, *Neela*, *Gauri* and *Rohini* are to be considered as capillaries, veins, lymph vessels and arteries respectively.)

CONCLUSIONS:

- 1) *Sira* are the vessels
- 2) Types of *Sira* i.e. *Aruna*, *Neela*, *Gauri* and *Rohini* are to be considered as Capillaries, Veins, Lymph vessels and Arteries respectively.

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