

## SIRA SHARIR - THE SCIENCE OF ANCIENT CIRCULATORY SYSTEM

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### ABSTRACT

The ancient texts of traditional science described *Rachna Sharir* as important aspect of *Ayurveda* which plays significant role for understanding structural concept of human body. *Ayurveda* classics described – “*Dosha Dhātu Mala Mulam Hi Sharīr*”, these basic elements are circulating through *Sira*, *Dhamini* and *Srotas* in our body and transportation takes place. *Acharya Sushruta* has clarified several anatomical details such as distinction among *Sira*, *Dhamni* and *Srotas*. He has explained anatomy of *Sira* in *Sharir Sthana* seventh chapter “*Sira varna vibhaktināma Sharīram*”. *Acharya Sushruta* defined *Siravedhan* as half *Chikitsa* in *Shalyatantra*. However, some *Siras* are contra-indicated for *Siravedhan* and termed as *Avedhya Sira*.

**KEYWORDS:**– *Sira*, *Avedhya Sira*, *Nadi*, *Dhamni*.

### INTRODUCTION

Human body is composed of many different types of cells that together create tissues and subsequently organ system. They ensure homeostasis and the viability of the body. *Acharya Charaka*, *Sushruta* and *Vagbhata* described seven hundred *Siras* in human body. According to *Acharya Sushruta* seven hundred *Siras* are divided in three regions – *Shakhagat*, *Kosthagat* and *Urdhvjatrugat* in which six hundred and two are *Vedhya Siras* and ninety-eight are *Avedhya Siras*. In these seven hundred *Siras*, forty are *Mool Siras* and they divide as *Vatavaha*, *Pittavaha*, *Kaphavaha* and *Raktavaha*, each ten in numbers. *Acharya Sushruta* described another division of *Siras Aruna*, *Neela*, *Sweta*, *Rohini* relevant with *Dosha* such as *Vata*, *Pitta*, *Kapha* and *Rakta Dosha* respectively.

## AIMS AND OBJECTIVES

- 1) To search and find out the references in relation to *Sira* in Ancient *Ayurveda* classics.
- 2) To understand the concept of *Sira* in *Brihatrayi* and *Laghutrayi* and other *Ayurveda* classics.

## Classical review

All the *Siras* are originated from *Nabhi* and spread all over the body. *Nabhi* is concerned with *Prana*. *Nabhi* is surrounded by the *Siras* from all sites like spokes arising from centre of a wheel. 'Sarnat *Sira*' denotes backflow of blood towards the heart without any force. Blood flow in these *Sira* by slowing velocity is called *Saran Kriya*.

A detailed description about *Sira* is available in *Charaka Samhita*,<sup>[1]</sup> *Sushruta Samhita*,<sup>[2,3]</sup> *Ashtang Sangraha*,<sup>[4]</sup> *Ashtang Hridaya*<sup>[5]</sup> *Kashyap Samhita*<sup>[6]</sup> and *Bhavprakash*.<sup>[7]</sup>

## Sira udbhava

*Acharya Sushruta* has explained that all the *Siras* are attached to the *Nabhi* and they spread *Urdhav*, *Adho* and *Tiryak* in the body. All the *Siras* present in the body originate from the *Nabhi* and from there, they spread in all directions. *Prana* resides in the *Nabhi* and the *Nabhi* is surrounded by *Siras* similar to the pivot hole being surrounded by spokes.<sup>[8]</sup>

## Sira rachna

*Acharya Vriddha Vagbhatta* has described, *Siras* that are passing through *Hridaya* are divided into the size of two- *Angula*, *Yava*, *Ardh Yava* and so on and become seven hundred. All the activities of the body are dependent on them.<sup>[9]</sup> According to *Acharya Laghu Vagbhatta* *Siras* are very large at their roots and very small at their tips, appear like the venation of a leaf (net-like); thus, they divide and become seven hundred in number.<sup>[10]</sup> There are two examples of *Pranali* and *Kulya* which are corresponding to the *Sthoola* and *Sukshma* *Siras* respectively.<sup>[11]</sup>

## Sira karya

The function of *Sira* is explained by *Acharya Sushruta* in *Sharir Sthan* that *Vata* is circulating by the *Siras* and performs physical and mental functions without any obstruction, promotes the intellect to work proper and prevents the mental deviation. When *Pitta*, circulating in *Pittavaha* *Siras*, it gives glow to the body, taste of food, maintains the digestive power and increases the immunity against diseases. When *Kapha*, circulating in *Kaphavaha* *Siras* it maintains the stickiness of various parts of the body, stability to the joint increases the

strength and performs its other normal functions of *Kapha*. When *Rakta*, circulating in *Raktavaha Siras*, it nourishes all *Dhatus*, gives luster to the body, receives tactile sensations. All the *Siras* carries all the *Doshas* in the body therefore *Siras* are considered as, '*Sarvavaha*'.

When these *Siras* are occupied with its own aggravated *Vata*, *Piita*, *Kapha* and *Rakta* it causes various disorders of *Vata*, *Piita*, *Kapha* and *Rakta* respectively.<sup>[12]</sup>

According to *Sharangdhar Samhita* *Siras* are carrying *Dosha* and *Dhatu* from one place to another place and unite the *Sandhi Bandhan* in the body.<sup>[13]</sup>

### Sira sankhya

<i>Samhita</i>	<i>Charaka Samhita</i>	<i>Sushruta Samhita</i>	<i>Ashtang Sangraha</i>	<i>Ashtang Hridaya</i>	<i>Kashyap Samhita</i>	<i>Bhavprakash Samhita</i>
<i>Sira Sankhya</i>	700	700	700	700	700	700

### Mula sira sankhya

<i>Acharya</i>	<i>Charaka</i>	<i>Sushruta</i>	<i>Laghu Vagbhatta</i>	<i>Vridhdha Vagbhatta</i>	<i>Bhavmishra</i>
<i>Mula siras</i>	10	40	10	10	40

### Distribution of sira

*Acharyas* have described various classification of *Sira* as per *Doshas* dominance in *Sira* and there *Adhishthan*.

#### A. Doshanusar madhya sharirgat sira sankhaya

Acharya sushruta						
Name of <i>Sira</i>	<i>Guda, Medha Shroni</i>	<i>Parshwa</i>	<i>Udara</i>	<i>Vaksha Sthal</i>	<i>Prashta</i>	Total
<i>Vatavaha</i>	8	4	6	10	6	34
<i>Pittavaha</i>	8	4	6	10	6	34
<i>Kaphavaha</i>	8	4	6	10	6	34
<i>Raktavaha</i>	8	4	6	10	6	34
Total	32	16	36	40	36	136

#### B. Doshanusar urdhvajatrugat sira sankhaya

Acharya sushruta						
Name of <i>Sira</i>	<i>Karnagat</i>	<i>Jihwagat</i>	<i>Netragat</i>	<i>Greeva</i>	<i>Nasagat</i>	Total
<i>Vatavaha</i>	4	9	8	14	6	41
<i>Pittavaha</i>	2	9	10	14	6	41
<i>Kaphavaha</i>	4	9	8	14	6	41

<i>Raktavaha</i>	4	9	8	14	6	41
<b>TOTAL</b>	14	36	34	56	24	164

**C. Doshanusar sira sankhya**

<b>Acharya Sushruta and Acharya Bhavmishra</b>			
<i>Doshanusa Sira</i>	<i>Shakhagat Sira</i>	<i>Koshthagat Sira</i>	<i>Urdhavajatrugat Sira</i>
<i>Vatavaha Sira</i>	25×4=100	34	41
<i>Pittavaha Sira</i>	25×4=100	34	41
<i>Kaphavaha Sira</i>	25×4=100	34	41
<i>Raktavaha Sira</i>	25×4=100	34	41
<b>Total</b>	400	136	164

**D. Doshanusar sira sankhaya**

<i>Sira</i>	<i>Charaka Samhita</i>	<i>Sushruta Samhita</i>	<i>Ashtang Hridaya</i>	<i>Ashtang Sangraha</i>	<i>Bhav Prakash</i>	<i>Madhav nidan</i>	<i>Sharang Dhara</i>	<i>Kashyap Samhita</i>
<i>Vatavaha Siras</i>	-	175	175	175	175	-	-	-
<i>Pittavaha Siras</i>	-	175	175	175	175	-	-	-
<i>Kaphavaha Sira</i>	-	175	175	175	175	-	-	-
<i>Raktavaha Siras</i>	-	175	175	175	175	-	-	-
<b>Total</b>	700	700	700	700	700	-	-	700
<i>Mula Sira</i>	-	40	10	10	40	-	-	-

**E. Shakhagat sira sankhya**

<i>Sira</i>	<i>Charaka Samhita</i>	<i>Sushruta Samhita</i>	<i>Ashtang Hridaya</i>	<i>Ashtang Sangraha</i>	<i>Bhavprakash Samhita</i>	<i>Madhav Nidan</i>	<i>Sharangd hara</i>
<i>Vatavaha Siras</i>	-	25×4=100	25×4=100	25×4=100	25×4=100	-	-
<i>Pittavaha Siras</i>	-	25×4=100	25×4=100	25×4=100	25×4=100	-	-
<i>Kaphavaha Siras</i>	-	25×4=100	25×4=100	25×4=100	25×4=100	-	-
<i>Raktavaha Siras</i>	-	25×4=100	25×4=100	25×4=100	25×4=100	-	-
<b>Total</b>		400	400	400	400	-	-

**F. The distribution of sira on the basis of their adhistan**

	<b>Site</b>	<i>Sushruta Samhita</i>	<i>Ashtang Sangraha</i>	<i>Ashtang Hridaya</i>
<b>I</b>	<i>Shakhagat Sira</i>	<b>400</b>	<b>400</b>	<b>400</b>
<b>II</b>	<i>Koshtagat Sira</i>	<b>136</b>	<b>136</b>	<b>136</b>
	<i>Shroni Sira</i>	32	32	32
	<i>Parshwagat Sira</i>	16	16	16

	<i>Purstagat Sira</i>	24	24	24
	<i>Udaragat Sira</i>	24	24	24
	<i>Urahgat Sira</i>	40	40	40
<b>III</b>	<b><i>Urdhvajatrugat Sira</i></b>	<b>164</b>	<b>164</b>	<b>164</b>
	<i>Greevagat Sira</i>	56	24	24
	<i>Hanugat Sira.</i>	16	16	16
	<i>Jihwagat Sira</i>	36	16	16
	<i>Nasagat Sira</i>	24	24	24
	<i>Neetragat Sira</i>	38	56	56
	<i>Kapalagat Sira</i>	60	-	-
	<i>Karnagat Sira</i>	10	16	16
	<i>Sankhagat Sira</i>	10		-
	<i>Shiragat (Head) Sira</i>	12	12	12

### G. The distribution of sira on the basis of their adhasthan

Bhavprakash				
Sthan	Vatavaha Sira	Pittavaha Sira	Kaphavaha Sira	Raktavaha Sira
<b><i>Koshthagat</i></b>	<b>Total 34</b>	<b>Total 34</b>	<b>Total 34</b>	<b>Total 34</b>
Shroni, Guda, Medra	8	8	8	8
Prashva	4	4	4	4
Prastha	6	6	6	6
Udar	6	6	6	6
Vaksha	10	10	10	10
<b><i>Urdhvajatrugat</i></b>	<b>Total 41</b>	<b>Total 41</b>	<b>Total 41</b>	<b>Total 41</b>
Griva	14	14	16	14
Karna	4	2	2	2
Jivha	9	9	9	9
Nasika	6	6	6	6
Netra	8	10	10	10

### Avedhya sira

The *Avedhya Siras* are the vessels which are prohibited for the *Siravyadha*. Any trauma to *Avedhya Siras* may lead to morbidity or death.<sup>[14]</sup> *Acharya Sushruta*<sup>[15]</sup> has described that seven hundred *Siras* are present in the body in which ninety- eight *Sira* are *Avedhya*. *Acharya Vriddha*<sup>[16]</sup> and *Laghu Vagbhatta* both are follows the *Acharya Sushruta*'s statement.

### Avedhya sira sankhya

Sthan	<i>Acharya Sushruta</i>	<i>Ashtang Sangraha</i>	<i>Ashtang Hridaya</i>
<i>Shakahagat</i>	16	16	16
<i>Kostthagat</i>	32	32	32
<i>Urdhvajatrugat</i>	50	50	50
Total	98	98	98

### Distribution of avedhya sira

Acharya Sushruta, Acharya Vriddha Vagbhatta and Acharya Laghu Vagbhatta has described the ninety-eight Avedhya Sira and its classification in detail in; *Sushruta Sharir Sthan* seventh chapter, *Ashtang Sangraha Sharir Sthan* sixth chapter and *Ashtang Hridaya Sharir Sthan* third chapter respectively. The distribution of Avedhya Siras are as follows according to Ayurvedic classics –

#### Shakhagat avedhya sira

<i>Pratyanga</i>	<i>Sushruta Samhita</i>	<i>Ashtang Sangraha</i>	<i>Ashtang Hridaya</i>
<i>Shakaha</i>	4×4 =16	4×4 =16	16

#### Madhya sharirgat avedhya sira

<i>Pratyanga</i>	<i>Sushruta Samhita</i>	<i>Ashtang Sangraha</i>	<i>Ashtang Hridaya</i>
<i>Shroni</i>	8	8	8
<i>Parsva</i>	2	2	2
<i>Prushtha</i>	4	4	4
<i>Udra</i>	4	4	4
<i>Vaksha</i>	14	14	14
<i>Total</i>	32	32	32

#### Urdhava jatrugat avedhya sira

<i>Pratyanga</i>	<i>Sushruta Samhita</i>	<i>Ashtang Sangraha</i>	<i>Ashtang Hridaya</i>
<i>Greeva</i>	16	16	16
<i>Hanu</i>	4	2	2
<i>Jihva</i>	4	4	4
<i>Nasa</i>	5	3	3
<i>Netra</i>	2	6	6
<i>Karna</i>	2	4	2
<i>Lalata</i>	7	-	7
<i>Sankha</i>	2	-	2
<i>Shira</i>	8	8	8
<i>Keshantanugat</i>	-	4	-
<i>Avart</i>	-	2	-
<i>Sthapni</i>	-	1	-
<i>Total</i>	50	50	50

### Avedhya sira vedhan lakshana

Acharya Sushruta has stated that Vedhan of Avedhya Sira leads to Vaikalya Marana.

### Anatomical considerations on sira in sushruta samhita

Acharya Sushruta described that term Sira indicate the vessels or as a particular it means veins. artery, capillary, vein, nerve and lymphatics.

## DISCUSSION

In *Yajurveda Hira (Raktavahini)* term is mentioned for *Sira*. According to *Amarkosha* synonyms of *Sira* are *Nadi* and *Dhamni*. *Acharya Sushruta* described the property of the *Doshavaha Siras* e.g. *Vatavaha*, *Pittavaha*, *Kaphavaha* and *Raktavaha Siras* are *Arun*, *Nila*, *Gorya* and *Rohini* in colour respectively. *Siras* are spread all over the body just like small laminae arising from the central core of the leaf, they originate from the *Nabhi* and there by spread all over the body upwards, downwards and obliquely. *Acharya Charaka* described in *Sutra Sthana* of *Charaka Samhita* that *Dhamni* having property of *Dhamanyat* and *Sira* having property of *Saran*. *Siras* are thick at the root but fine at periphery and they are spread like the veins of a leaf. Thus, they become seven hundred in number. *Acharya Kashyap* has been described in the *Sharir Sthan* fourth chapter that number of *Siras* are seven hundred and *Hridaya* is the *Mula* of these *Siras*. Different *Acharyas* mentioned different terminology which indicates the features of *Sira* like-

- *Siras* are spread all over the body form originated from heart so it is considered as vessels as per modern science.
- *Siras* are thick at root but fine at periphery so it can be considered that these *Siras* are forms network in the body just like network of Vein, Venule, Capillary, Arteriole and Artery in modern science.

## CONCLUSION

- The origin of *Siras* described by *Ayurveda* classics i.e. *Nabhi* can be correlated with prenatal circulation and while origin of *Sira* described by *Hridaya* appears to be related with post-natal circulation.
- The appearance of the network of *Sira* resembles with the vascular distribution pattern describes in modern anatomy.
- The features of *Vatavaha Sira* in *Ayurveda* classics resembles with arteriole and capillary.
- The characteristics of *Pittavaha Sira* in *Ayurveda* classics resembles with the venous system.
- The features of *Kaphavaha Sira* in *Ayurveda* classics resembles with the lymphatic system.
- The characteristics of *Raktavaha Sira* in *Ayurveda* classics resembles with the artery system.



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