

**A CRITICAL REVIEW ON URDHWA SHAKHAGATA AVEDHYA  
SIRA AND ITS CORELATION WITH MODERN ANATOMICAL  
STRUCTURES BY CADAVERIC DISSECTION IN CONTEXT TO SIRA  
MARMA AND ITS VIDDI LAKSHANA**

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Article Received on  
31 August 2018,

Revised on 20 Sept. 2018,  
Accepted on 10 October 2018

DOI: 10.20959/wjpr201818-13553

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**ABSTRACT**

Ayurveda the science of life gives a vast description on human body and its anatomy in sharirsthana. While explaining the definition of sharir i.e. human body acharya have clearly stated that shakhas are also important parts in the formation of sharir. Ayurvedic classical text mention that there are four limbs, middle trunk as fifth part, sixth one is sheer and this forms shadangasharir. Thus knowledge regarding shakha and its sirasharir is important for a physician, to understand pathology, diagnose, and management of various diseases. The way basti is called the ardhachikitsa in ayurvedic medicine (half therapeutic modality of ayurvedic medicine) similarly in surgical aspect. Raktmokshanaplays important role in pacifying those diseases, which cannot be cured by snehanadiupkramas. Siravedhana is one of the

method of raktamokshana. Raktamokshana or blood letting is a effective treatment from surgical aspects. Here impure blood with vitiated dosha is lett out by various methods and Siravedhana is one of the method of raktamokshana. There are total 700 sira's mentioned in ayurveda. They are known to provide nutrition to body in the same way as like various channels provide water supply to the field. Out of these 700 siras, 98 sira's are avedhyasira's.

Avedhyasira's are those sira's that are strictly contraindicated for venepuncture. Thus to treat patient with this treatment modality knowledge regarding its contraindications and fatal effects becomes a key point to remember for a physician. This literature work is a small effort to study urdhwashakhagataavedhyasira's. Out of 98 vedhyasira's total sixteen vedhyasira's are found in shakhas. Out of these 8 vedhyasira's are found in urdhwashakha or upperlimb.

**KEYWORDS:** Avedhyasira, siramarma, jaldhara, bahvi, lohitaaksha.

## INTRODUCTION

Sharir is considered as purushadhara and to maintain this purushadhara healthy and sound body is very important. Ayurveda the science of life has a vast canvas of description of various concepts related to sharir. Knowledge regarding sharir is very well described in classical ayurvedic text and samhita grantha's.

Sushrutasharirsthana holds due importance since it is considered as basic grantha of sharirdnyana.<sup>[1]</sup>

Also various other grantha's have given description regarding sharirdnyana in their sharirsthana's.

Sharir or human body is defined to have shakhachatastra (i.e. four limbs), madhyampancham (i.e. thoraco abdominal cavity or trunk) and shastham sheer (i.e. head, neck and brain) and this is together known as shadangasharir.<sup>[2]</sup>

Charakaacharya also states the definition of sharir in likewise manner dwebahu, dwesakhthinii.e 2 upper limbs and 2 lower limbs, shirogrivami.e head and neck related organs, antaradhihi.e trunk or middle of the body.<sup>[3]</sup>

Likewise modern anatomy explains human body as four limbs, head neck and trunk.

Since sharir is purushadhara and to maintain his purushadhara healthy and sound body is very important for this purpose knowledge regarding the rachana and kryia of shariri.e. anatomy and physiology of body is of most importance.

Various unique concepts of ayurveda, sirasharir also holds vital position. The way concept of basti is mentioned as chikitsaardha by kayachikitsa, similarly siravedha is equivalently recognized treatment modality in shalyatantra.<sup>[4]</sup>

A physician must have whole knowledge regarding therapeutic measure he uses while treating a patient And for this purpose knowledge regarding indications and contraindication is very essential because preventive aspect is always better than curative aspect.

Siravedha is one of the method of rakatmokshanamentioned. Siravedha or venepuncture is method of blood letting. In Ayurveda various diseases are mentioned where snehana (oleation), swedana, lepana(anointments) like measures fail to relieve the symptoms quickly, wherebyraktamokshana proves to be utmost reliever.<sup>[5]</sup> Thus to treat such diseases, being a physician one should have proper knowledge regarding sira's, indications and contraindications of siravedha and fatal effects of trauma to avedhyasira. For this purpose here a sincere effort is taken to compile and review the literature on avedhyasira's in the urdhwashakha's. Also the cause of their prohibition will be mentioned. So that a physician becomes alert, while he treats the patient with preventive aspect rather than curative aspect. Trauma to these avedhyasira's may endanger patient's life, or prove fatal.

Acharya sushruta has described concepts of marma's andsira's one after another, since they are correlated. Many of the avedhyasira's are conjoined with marma's. Hence knowledge regarding both plays a key role for a physician while using this treatment modality.

## DISSCUSSION

### Definition of sira

'Sarnatsira' is the known definition of sira's given in classical literature.<sup>[6]</sup> Literature states sarana as "Avyavantrgamanat". Sarana means to keep moving or to keep in velocity.

### Sira Utpatti

Sira's are developed from asruka, snehansha of meda and mansa with help of vyau undergoing mrudupaka by the action of agni.<sup>[7]</sup>

### Synonyms of sira

Sira, strotasa, marga, dhamani, nadi.<sup>[8]</sup>

### Udbhavasthana/Prabhavasthana

Nabhii.e.umbilicus is said to be the origin of sira's. Nabhi is assumed to be like wheel. Where depiction of umbilicus is given as axle of a wheel and sira are elicited as spokes of the wheel.<sup>[9]</sup> In ayurvedanabhi is ascertained as seat of prana. Since nabhi is prabhavasthana of sira, andsira's are helping channels in the circulatory system of body to provide nutrition it is

said that prana resides here.<sup>[10]</sup> The ten mulasira are attached to hridaya. Theaparaoja is circulated through sira to the whole body.

### Number of sira's and distribution

There are total 700 sira's in the body mentioned in various ayurvedic classical text.

Further description mentions that there are 25sira's of each dosha in one limb i.e.vatavaha -25, pittavaha -25, kaphavaha-25, asrukavaha -25.

Therefore each limb has 700 sira's and thus total 400 sira's are said to be shakhagatasira's.<sup>[11]</sup>

Sr.no	Location of sira's	Total no. of sira's	Avedhyasira's
	Shakhagata	400	6
2	Kosthagata	36	32
3	Urdhwagata	64	50
4	Total	700	98

According to acharyacharaka these seven hundred sira divide further minutely to form 29956 sira's. The above mentioned sira's have wide opening in beginning and smaller opening at the end as like that of romakupa. Further he states it might be quiet possible that they are more than this also at minute levels.<sup>[12]</sup>

All of them have a common origin i.e. nabhi (umbilicus).

Umbilicus is assumed to be axle hole surrounded by spokes. The way water channel provide water to field, sira's provide nutritive matter to various body part. The various poshananyaya's are elicited like, upsnehananyaya, upswedannyaya, kedarkullyanyaya etc.

The way water diffuses in field through water channels, same way nutritive material in sira's also diffuses and provide nutrition to the body.<sup>[13]</sup>

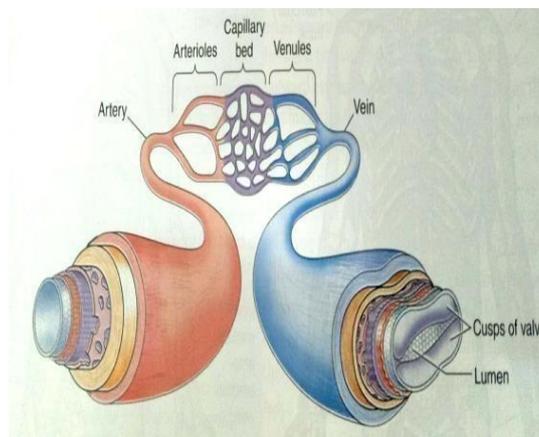
Sr.no	Types of sira	Sanskrit name	Special Features	Total no.
1	Vatavahasira	Aruna	Crimson red in color	75
2	Pittavahasira	Neela	Blue in color (warm to feel on touch)	75
3	Kaphavahasira	Gouri	White in color (cold and steady)	75
4	Raktavahasira	Rohini	Bright red (luke warm touch)	75

Similarly, on the basis of their description these sira's are assumed to be similar to following structures in modern anatomy. This distribution seems to be according to the matter they carry.

Vatavahasira	Arteries, Nerves	Vatadoshayukta (They carry deoxygenated blood)
Pittavahasira	Veins	Pitta doshayukta (Convey deoxygenated blood.)
Kaphavahasira	Lymphatic vessels	Kaphadoshayukta (convey lymph, white or colourless)
Raktasira	Capillaries	Raktavahini (They carry oxygenated blood)

These sira's with their properties of akunchana (contraction) and prasarana (dilatation) provide nutrition to body as the water channels provide to field. Due to this the matter in sira has tendency to remain in velocity. And thus the saranakriya is achieved.<sup>[14]</sup>

These sira's are assumed to be spread in body as like vein on the leaf. Similarly nabhi is origin and sira's are assumed to spread in upward, downward and oblique directions.<sup>[15]</sup> Modern anatomy of sira's also depicts that large arteries originated from heart leave the heart. They further branch to reach various body tissues and further divide into smaller vessels called arterioles that penetrate the body tissues. A network of capillaries is formed within the tissues substances move in and out of capillary wall as the blood exchanges material with cells. This is exactly what is depicted in upsnehananyayas of poshana. Before leaving tissues capillaries unite to form venules, which are small veins. Venules merge to form large vein and these vein return deoxygenated blood to heart.



**Fig. below shows network of capillaries and venules.**<sup>[16]</sup>

Here an effort is taken to compile literature regarding urdhwashakhagataavedhyasira and marma's related to it in context to viddhilakshana and modern anatomical structures involved in the same.

### Avedhya Sira

Avedhyasira are those veins/vessels which are strictly contraindicated to venesection. Puncturing them by mistake or adamantly proves to be fatal for the patient. These are the total 8 avedhyasira's mentioned as urdhwashakhagataavedhyasira in literature.<sup>[17]</sup>

Sr.no	Name of avedhyasira	Total no.
1	Jaldharasira	2
2	Urvisira (Bahvisira)	4
3	Lohitakshasira	2

### Sira Vedha

Siravedha is method of 'Raktamokshana'(blood letting). Vedhana means striking, the therapeutic modality in which veins struck with sharp object in its mentioned depth according to classical text and allowed to bleed is siravedha.

### Vedhanapramana

As like avedhyasira's; sira's which can be punctured for therapeutic purpose are also mentioned. Along with that the distance for the depth for striking is also mentioned in classical ayurvedaliterature, so as to avoid complication and failure of treatment modality.

A physician should cautiously puncture the veins as told by acharya 's for successful treatment. Least puncturing leads to poor blood letting which doesn't help to cure rather it lands into complications. So these guidelines are to be followed.<sup>[18]</sup>

Sr.no	Areas for SiraVedhana	Vedhanapramana
1	Mansala(muscular)	Yavapramana.i.e size of barely grain
2	Sira on bones	½ yavapramana using kutharika Shastra
3	Other sites	½ yava or vrihipramana using vrihimukhashastra.

**Avedhya sira's in urdhwashakha:** Total no. of sira's in urdhwashakha are 200 out of which 8 are avedhya. In classical text it is mentioned as one sira or vein which is superficial i.e. jaladhara vessels should not be puncture. i.e 2urvi and lohitaksha are the vessel that are strictly prohibited for puncture.

Here literature has mentioned urvi in lower limb as bahvi in upper limb.

### Concept of sira marma

The word marma means vital points of body. According to dalhana, the commentor of

sushrutasamhita, marma is the point the point where if injury or trauma is made death occurs. According to sushruta marma is vital point in the body where mansa (muscles), sira (blood vessels), snayu (ligaments), asthi (bones) and sandhi (joint) conjoined. The prana resides here. Therefore any trauma to these points caused death.

There are 107 marmas, and according to structure he has classified marmas into 5 types out of which one variety is siramarma, they are 41 in no. [19]

Niladhamani -4, matrika -8, srungataka-4, apanga-2, sthapani-, phana- 2, stanamula2, aplapa2, apastambha-2, hrudya-1, nabhi-1, parsvasandhi -2, bruhati2, lohitaaksha4, urvi- 4.

The main symptoms of marma injuries are bleeding and unconsciousness. In this context sushruta said that there are four types of sira's in the body. Being conjoined with mansa, small asthi and sandhi, these sira's supply nutrition to them and maintain the sound status of body.

But trauma to these marma, vitiates the vatadosha and that encircles the siras which lead to severe pain and consciousness is gradually lost. Thus it is clearly noted that sira's help in maintaining purushadhara. Similarly modern science also states that every structure in body is supplied by neurovascular bundle it is a tripod of artery, vein, and nerve. And in siramarma concept of sira.

Marmaviddhilakshana of urdhwashakaghataavedhyasira that out of the above three bahvi and lohitaaksha are mentioned as siramarma's in classical text with their viddhalakshana or symptoms of trauma to them are elicited.

Urdhwashakaghataavedhyasira and marma's related to them with their viddhilakshana. [20]

Sr.no	Name of the Sira	Marma's related to these sira and their Angulpariman	Viddhilakshana
1	Lohitaaksha	Lohitaakshamarma -1/2 angul	Death due to bleeding /paralysis of upper limb.
2	Bahvi	Bahvi marma-1 angul	Profuse bleeding and atrophy of the arm.
3	Jaldhara	Kurch sheer-	Pain and inflammation of local site.

Location of the vedhyasira's and their correlation according to modern anatomy-

**Lohitaksha Sira**

Lohita =bleeding; aksha =eye. Trauma to this sira depicts to be like bleeding eye; so it might be named accordingly.

Above bahvisira and below shoulder joint and in lateral fold of axilla can be marked as site of lohitakshasira, i.e. structures lying in lateral wall of axilla can be considered. Since its viddhilakshana's have been mentioned as excessive bleeding leading to death and paralysis of the arm or hemiplegia i.e sensory and motor loss of functions of that side. Following structures can be considered as lohitaksha; Lower part of axillary artery, Axillary vein, The median nerve, biceps brachii muscle, coracobrachialis, brachialis muscle are related to this.

These structures are located between anterior and posterior walls of axilla. Cords of brachial plexus are closely related to these structures and thus any trauma or surgical intervention in this region may cause bleeding and paralysed muscles of upper limb.

Fig below shows a cadaveric dissection of upper limb with lower part of axillary artery shown by arrow, surrounding muscles i.e. biceps brachii, brachialis, coracobrachialis and cords of brachial plexus.



Fig below shows a cadaveric dissection of upper limb with axillary vein shown by arrow, surrounding muscles i.e. biceps brachii, brachialis, coracobrachialis and cords of brachial plexus.



Thus injury to these structures will cause the exact fatal symptoms as mentioned in classical text in reference to lohitaakshasira.

### **Bahvi Sira**

As like urvisira is sira of lower limb; its counterpart in upperlimb can be considered as bahvi i.e. which is in the middle of bahu.

For better explanation we can assume that point on mid point between head of humerus and condyles of humerus can be bahvisira. According to fatal symptoms on injury to this siramarma i.e. blood loss and atrophy of arm. Following structures can be considered under this title; Brachial artery Profundabrachii artery.

### **Brachial Artery**

Continuation of axillary artery from medial side of arm to front of elbow. Two venae comitantes accompany it.<sup>[21]</sup> The median nerve of arm biceps brachii muscle, brachialis muscle are structures in the periphery of this artery.

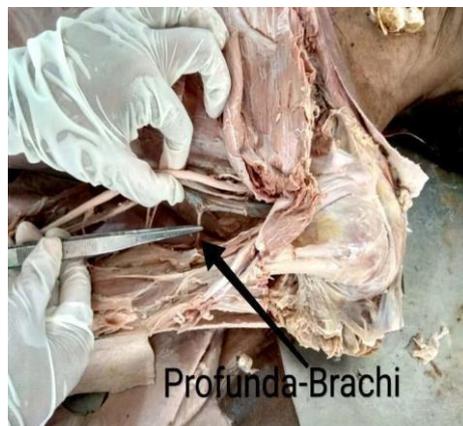
### **Profundabrachii artery**

Branch of brachial artery arising below teres major muscle. Through radial groove it accompanies radial nerve before it pierces the lateral intermuscular septa and divides into anterior and posterior descending branches which anastomose at elbow joint. Thus trauma to this structure leads to profuse bleeding and atrophy of arm. This is exactly similar to viddhalakshana of bahvi sira.<sup>[22]</sup>

Fig below shows a cadaveric dissection of upper limb with brachial artery shown by arrow, surrounding muscles i.e. bicepsbrachi, brachialis, coracobrachialis and cords of brachial plexus.



Fig below shows a cadaveric dissection of upper limb with profunda brachii shown by arrow, surrounding muscles i.e. biceps brachii, brachialis, coracobrachialis and cords of brachial plexus, and structures deep to it.



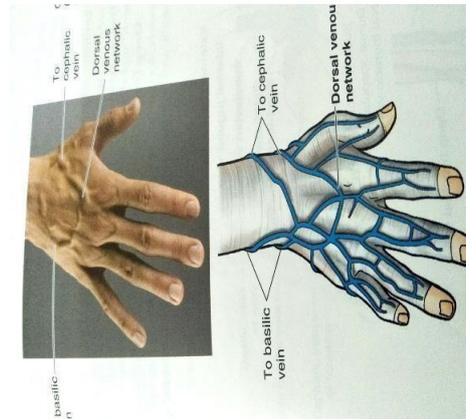
### Jaladhara

The structure where mansa, sira, snayu, and asthi form a network i.e. jala. As the sira is found in this jala it is known as jaladhara. This sira is mentioned as bahaya or superficial sira. This sira is said to be kurchshirovyapini i.e. at the site of kurch sheer marma. Kurch sheer marma is approximately to be a point on radial and ulnar collateral ligaments. Below the kurpar sandhi bilaterally. Injury to this causes pain and inflammation.<sup>[23]</sup> According to modern science it can be compared with:

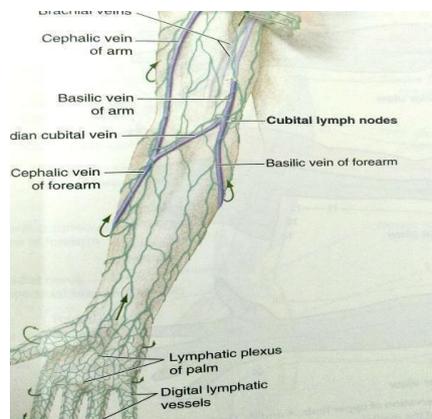
### Cephalic vein

Superficial vein of the arm. Preaxial vein of upper limb. It begins from lateral end of dorsal venous arch runs upwards through roof of anatomical snuff box and winds around lateral border of distal parts of forearm and continues upward in front of elbow.<sup>[24]</sup> Since ulnar and

radial collateral ligaments are structures related to it and injury to this vein may cause pain and inflammation at that site. Thus cephalic vein can be assumed to be jaldharasira in the upper limb Fig below shows the dorsal venous arch of upper limb.<sup>[25]</sup>



**Fig. below shows superficial cephalic vein in upperlimb.**<sup>[26]</sup>



**CONCLUSION**

Thus the urdhwashakhagataavedhyasira’s can be compared accordingly.

Sr.no	Name of sira	Comparison according to modern science
1	Lohitakshasira	Axillary artery +Axillary vein
2	Bahvisira	Brachial artery+Profundabrachii artery
3	Jaldhara	Cephalic Vein

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