

**Study of Sushrutokta Vedhya Sira of Urdhavshakha In Siravedhan Vidhi**

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**Abstract:**

The term “Sira” is collectively used for blood vessel (Arteries, Veins, Capillaries and Lymphatics ) which denote the circulatory system. Some siras are not suitable for *venouspuncture*. These siras are called *Avedhya Sira*. A surgeon should not perform *venesection* on these sira as it may be harmful for patient; on the contrary, some sira are suitable for *Siravedhan*, called *Vedhya Sira*. The anatomical locations are available in classic texts but exact structures and the anatomical description regarding vedhya sira are not described yet. Proposed article aims to correlate *urdhvashakhagat vedhya siras* mentioned by our *Aacharya* with modern anatomical structures and review in contemporary science. For this purpose, ancient *ayurvedic* classics were reviewed and references are compiled for the said subject was critically studied to comprehend the *vedhya sira* in upper extremities.

Primary knowledge of *vedhya Sira* is very important for physicians as well as surgeons. The *vedhya sira* mentioned in *Ayurved* compendia can be correlated with blood vessels, vein in modern anatomy.

## Introduction:

The term sira, at 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, sira is one of such structures having its structural, clinical and surgical significance.) The important descriptions about sira are mentioned by our mentors / aacharyas in ayurvedic classical text like, shushrut samhita, charak samhita, ashtang hridaya and other texts. In sushrut samhita 4 types of sira- Aruna varna (crimson), Neela varna (blue), Gour varna (white) and Rohini (red) which are relevant with three dosha- vata, pitta, kapha and rakta respectively. The term sira stands for channels through which substances or physical forces flow. Sira serves as a channel for rakta dhatu which helps to nourish the body and maintain healthy state. Pathway of sira resembles to the venations of the leaf. According to Ayurvedic texts i.e. Sira emerges from the umbilicus from which they spread into upwards, downwards and obliquely branches throughout the body.

As per the classics total Sira are 700 in number. These are classified on the basis of dosha, adhishtana, vedhya and *avedhya* in *sushrut samhita*, where 98 sira are *avedhya* Sira which are strictly

prohibited for puncturing. So we can conclude that remaining sira which are superficial can be used for blood letting.

Each urdhva shakha (upper limb) consist of 100 siras out of which 4 are *avedhya* siras as per aacharya sushrut, that can't used for Sira vedhana. So for remaining sira, aacharya have mentioned the particular sites of siravedhana in particular disease, but the exact sira present at that particular site which should be used for siravedhana has not mentioned. Hence their anatomical description and their surgical importance need to be evaluated.

As the siravedhana is the mainstay of all treatment in shalyatantra there are several examples of disease which can be cured by siravedhana process like Grudhrasi (Sciatica), Vishvachi, Unmad, Apasmar etc. as per aacharya sushrut. Siravedhan vidhi being less expensive, less time consuming and with minimum side effect it gives better and quick relief. So more emphasis should be given on these vedhya sira for siravedhan chikitsa.

## Aim and Objectives:-

- To study sira sharir with the help of ayurved and modern science.
- To correlate the urdhvashakhagat vedhya sira with modern anatomical structures.

- Try to specify particular sira, its site and name, which can be used in siravedhana vidhi of urdhav shakha according to the ayurvedic texts and modern phlebology.

### Materials And Methodology:-

- All sorts of references has been collected and compiled from various ayurvedic texts like bruhatrayi and laghutrayi, available commentaries and text books along with modern science.
- Research articles from various website related to sira sharir were accessed.
- Collected literature was critically reviewed.
- With the help of superficial dissection of upper limb and literature collected an attempt was made to correlate the urdhava shakhagat vedhya sira with modern anatomy.
- Based on the correlation, the conclusion were drawn.
- For Anguli pramana and other measurements we selected a standard reference book of the ayurvedic formulary of India part-2, ayurvedic measurements are taken as follows

1 Anguli =  $\frac{3}{4}$  inch = 1.95 cm

- Photography: Photography of both methods was done by using 12 mp camera.

### Review Of Literature:-

#### Structure of Sira

According to Sushruta, Structure of Sira are like the fine fibers in the leaf of a tree, thicker at their roots and finer towards the end, the branches of the Sira resemble the tendrils, the first branch gives out a branch and this again gives out another branch and so on. The blood flows in all the sira throughout the body as the water channels in different areas of a garden or agricultural field.

This drushtant (relevant illustration) of leaf very well correlates with the structural aspect of (sira) blood vessels. Large arteries leave the heart and branch into smaller ones that reach out to various parts of the body. These divide still further into smaller vessels called arterioles penetrating the body tissues. Within the tissues, the arterioles branch into a network of microscopic capillaries. Substances enter and exit of the capillary walls as the blood exchanges materials with the cells. Before leaving the tissues, capillaries unite into venules, which are small veins. These venules merge to form

larger and larger veins that eventually return blood to the heart. The walls of arteries, veins, and capillaries differ in structure. In all three, the vessel wall is surrounded by a hollow center through which the blood flows. The walls of both the arteries and veins are composed of three coats, but they differ in thickness. The inner and middle coats of arteries are thicker than those of veins. This makes arteries more elastic and capable of expanding when blood surges through them from the beating heart. The walls of veins are more flexible than artery walls. This allows skeletal muscles to contract against them, squeezing the blood along as it returns to the heart. One-way valves in the walls of veins keep blood flowing in one direction. The walls of capillaries are only one cell thick. Among all the blood vessels, only capillaries have thin walls enough to allow the exchange of materials between cells and the blood.

### **Urdhavshakhagat Vedhya Siras**

Vedhya sira means that veins which can be punctured at proper site to release the impure blood without any complications or side effect and which can be interfered with the surgical process. Puncturing of these sira will not cause any harm to the body. It is conjointly mentioned by the aacharyas that through these veins only the safer

bloodletting should be done for curing various diseases.

There are 384 vedhya Sira present in the Shakhas (both lower and upper extremities).

Amongst them 192 vedhya Sira are present in upper extremities (Urdhvashakhagat). Means 96 in each upper limb.

### **Jaal:-**

Network of each muscles, blood vessels, ligaments, and bones are four, they are situated in ankles bound & mixed together with holes by which the entire body is falling net like holes.

### **Modern science: -**

There are no specific guidelines for vedhya Siras (contra indicated veins). All veins can be considered for puncturing as per necessity & emergency.

### **Structure of Vein–**

Venous return to the lower extremity is provided by two sets of veins namely the superficial and the deep veins. The superficial veins are superficial to the deep fascia and are often located at or below the investing layer of superficial fascia in the subcutaneous tissue. Deep

veins are situated deep to the deep fascia and often accompany the artery and the nerves supplying the lower limb forming a neurovascular bundle.

Venous blood flow is a passive flow (not supported by a smooth muscle pump such as the heart). The direction of the flow is maintained by the valves within the Veins which prevents the back flow. The valves are found near the entrance of a tributary. Venous channels are smaller, return blood from different tissue of body. The wall of vessels is thin and transparent, made of elastics fibers (hence it has property of constriction & dilation).

#### **Veins consist of three layers:**

- 1) Tunica adventitia- outer layer & consist of connective tissue which surrounds, protects & support vessels.
- 2) Tunica media –middle layer & consist of muscular tissue & nerves fibres which stimulate to contract or relax. (Stimulation by medulla oblongata)
- 3) Tunica interna- inner layer & constructed of smooth endothelial cells which facilitates the blood cells etc. endothelial cells develops fold known as semilunar valves. These valves are noticeable bulges in veins, mostly present in larger blood vessels which helps blood

to move toward heart by preventing back flow.

#### **Venesection Indications, location and causes**

##### **Indications: -**

- Thrombosed veins – these feel hard and cord.
- Tortuous, sclerosed, fibrosed, inflamed, fragile veins

##### **Location:-**

- Veins that cross over joints, bony prominences.

##### **Causes:-**

- Medications – ( e.g.- anticoagulants, steroids, thrombocytopenia)
- Injury, disease or treatment may prevent the use of a limb (e.g. amputation, fracture, cerebrovascular accident).
- Surgery on one side of the body, for example, mastectomy and axillary node dissection, as this can lead to impairment of lymphatic drainage.

- Hematological factors decreased level of Hb% (Hemoglobin) and PLC (Plate Late Counts)

### Dissection of upper limb:-

For the dissection we follow mainly two method of dissection.

1. Dissection of upper limb in detail
2. Superficial dissection of upper limb: for the identification of exact mentioned veins in siravedhana vidhi of upper limb.

### Superficial dissection of upper limb:-

For the identification of exact sites of superficial veins mentioned in siravedhana vidhi of upper limb, we followed the following method of dissection.

### Preparation for dissection:-

At first, a well preserved, intact cadaver of middle aged and medium build, has been taken for dissection.

The upper limb of the body was coloured by white acrylic colour and below mentioned colours were used for

the exact identification of surface marking and superficial structures.

- Yellow:- for the marking of distance mentioned in siravedhana vidhi from the various surface land marks as per classics.
- Red:- for the exact site of siravedhana.
- Black:- for making a circle around the siravedhan site.
- Orange:- for the marma point.
- Green:- for the surface marking of inguinal ligament and joint.

### Main procedure:-

To study the superficial veins located on the anterior part of upper limb, cadaver was placed in supine position. Then started dissection of front and back side of arm, forearm and hand.

Sushrutacharya have mentioned different siravedhan sites for particular diseases of upper limb. So, according with the help of keen dissection, photographs of superficial veins found in dissection are taken for each site.

### Observation:-

On the basis of literature study and with the help of dissection; the observations were made. In the siravedhana vidhi (specifically

considering upper limb) veins used were superficial veins according to various disease mentioned specifically in upper limb. In the following diseases and mentioned sites, below mentioned superficial vein may be used as exact site of bloodletting.

In aavbahuk above the kshipra marma two angula i.e. 3.9 cm. Dorsal venous arch is present which can be used as exact site of siravedhana.

In vishwachi four angula above or below the kurper, there cephalic vein is present. So it may be taken as point of bloodletting that avedhya sira i.e. deep vein and arteries. We should considered so in vishwachi cephalic vein may be used for bloodletting.

In yakrutvyadhi and other diseases like shawas, kasa. The site is dakshin (right) kurperantha site i.e. there are three major superficial veins 1) cephalic 2)

median cubital and 3) basilic vein; but out of all these a superficial structure was cephalic vein so it may be considered as point of bloodletting.

In yakrutvyadhi, plihavyadhi other diseases like shawas, kasa another sites for siravedhan is kanikshthika and anamika yoho madhe i.e. first dorsal metacarpal veins of both hands.

#### Conclusion:-

1. The sira considered for siravedhana vidhi specifically in the diseases related to urdhvashakha by aacharyas can be considered as superficial veins in the upper limb according to modern anatomy.
2. The specific location of sira (superficial veins) for siravedhana vidhi (bloodletting procedure) in urdhvashakha (upper limb) can be considered as follows:

Sr. No.	Diseases	Exact location	Superficial vein for siravedhana
01	Aavbahuk	3.9 cm above the kshipramarma	Dorsal venous arch
02	Yakrutvyadhi	3.8 cm from mid point of kurper sandhi medially of right hand	1) cephalic 2) median cubital 3) basilic vein
03	Plihavyadhi	3.8 cm from mid point of kurper sandhi medially of left hand	1) cephalic 2) median cubital



			3) basilic vein
04	Vishwachi	In the medial of arm 7.8 cm above the elbow joint and in the medial of arm 7.8 cm below the elbow joint	
05	Shawas, Kasa	3.8 cm laterally above wrist joint, present between kanikshthika and anamika yoho madhe	First dorsal metacarpal veins

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