



**Discussion
&
Conclusion
-
Avedhya Sira**

AVEDHY SIRA - VITAL VESSELS

अत ऊर्ध्वं प्रवक्ष्यामि न विध्येद्वाः सिरा भिषक् ।

वैकल्यं मरणं चापि व्यधात्तासां ध्रुवं भवेत् ॥

- सु.शा. ७/१८

In shall speak about those Siras which are not to be punctured for blood lettings If the Siras which must be preserved intact are cut would certainly end in Death or Vaikalya of that part.

Sira are 700 in numbers, 98 of them are said to be Avedhya.

These 98 Siras should be cared and saved while doing operative procedure.

| Limbs - 4 | Supraclavicular Region | Kostha (Thorax and Abd.) | Total |
|-----------|------------------------|--------------------------|-------|
| 16 | 50 | 32 | 98 |

STUDY OF AVEDHYA SIRA IN LIMBS:

98 Avedhya are spread all over body i.e. head Neck face; Upper and lower Limb and Thorax Abdomen.

Of these, 16 Avedhya Siras are Seen in all 4 Limbs and I have decided to Concentrate these Sira for further study purpose, because Within 3 years short duration I have to complete my doctoral work.

As stated earlier, the Siras are 4 types which are present in each limb separately thus becoming sixteen in number.

| Limbs. | R1 | Lt. | Total |
|--------------|-----------|-----------|-----------|
| Upper Limb | 04 | 04 | 08 |
| Lower Limb | 04 | 04 | 08 |
| Total | 08 | 08 | 16 |

The names of Avedhya Siras are.

| | | |
|-----------------------|---|---------------------------|
| Jaldhara – (Exterior) | - | 01 |
| Inner to it are | - | 02 Urvi (उर्वी) |
| | | 01 Lohitaksha (लोहिताक्ष) |
| Types of Sirs | - | Vat Vah Sira |
| | | Pitta Vah Sira |
| | | Kaph Vah Sira |
| | | Rakta Vah Sira |

EFFECT OF CUTTING / PUNCTURING OF AVEDHYA SIRAS:

If above Avedhya Sira is injured / cut / punctured while doing operative procedure. Either -

- 1) Those parts will be Vaikalyakar i. e. having loss of typical activity or loss in the dhatu / tissue in that part permanently.
- 2) Or there will be death . As the limbs are concerned on cutting or puncturing of above avedhya sira there will be functional loss and local tissue death upto some extent resulting in the chances vaikalyakaratra in Limbs.

VAIKALYA -

This word is Similar to Vikalangata meaning, the form of atrophy complete or partial activity of limb.

This is of two types -

- 1) Physiological - loss of function i. e. the inability in the flexion, extension, pronation, Supination etc.
- 2) Atrophy / Muscular wasting of Limb, due to lack of no nourishment.

Both these anomalies may occur as a result of cutting or puncturing of Avedhya Sira while doing operative procedure. If any one of four Siras or All of 4, have injured (by cutting or puncturing) the ultimate result will be Vaikalaya Karatva oSdY; djko½ . Defect or Deformity or Abnormality or Malfunction dysfunction of that Limbs.

Therefore extreme care should be taken to Save these siras.

REASONS BEHIND THE NON-PUNCTURING OR AVEDHYATVA (M):

The sira in the limbs are contraindicated to puncture because, careful study with the help of modern techniques reveals that -

- 1) Those vein draining into a big vein forming junction and having the size of > 1 angul or 5 to 27 mm. and through which blood flows at the rate of > 35 mm/sec. are not cut close to the draining point or junction e.g. cephalic vein draining into axillary (Ref. fig. no. 3) and great saphenous draining into femoral (Ref. fig. no. 2) etc. If these veins cuts there will be uncontrollable and severe blood loss resulting in hypotension, shock, cardiac failure and finally to death.
 - 2) A vein having big in size of 2 angul or 31 mm in diameter e.g. superior and inferior venaceva must not be punctured, because blood in these veins flows at the rate of 150 mm/sec. and if it cuts bleeding would not be controlled resulting into death.
 - 3) A vein runs mostly parallel or intermingled to an artery nerve thoracic duct as its companion or as venae comitantes of an artery, e.g. Brachial, Axillary, Femoral etc. and there is a possibility of cutting of vein with artery resulting in severe blood loss and death or deformity.
 - 4) A venous plexus accompanied by small artery supplying a vital organ, e.g. pampiniform plexus of spermatic cord with testicular, cremasteric, artery
-
-

to ductus deference of the spermatic cord supplying the testes and spermatic cord, ischaemia of which may be dangerous, veins accompanying lateral thoracic artery supplying the mammary gland which is vital for breast etc.

- 5) Vein running close to a nerve, sensory or motor to avoid paralysis or pain sensation e.g. in the gluteal region veins close to sciatic nerve etc.

Here Sushruta⁵ advices to the surgeons that, there is no one (surgeon) who can be perfectly trained in the skill of venepuncture because these (veins) are slippery by nature. They move to and fro like a fish and hence they should be stroked carefully.

Certain veins (siras) in the extremities, pelvis, flanks, back, abdomen, thorax and head, neck (region above the clavicle) etc. were forbidden for the purpose of venepuncture by the Ayurvedic surgeons as these veins (siras) were known for causing disability or death if punctured.

**Now, the question arises among jaldhara, Urvi and Lohitaksha -
Which is Vat / Pilita / Kaph / Ratka Vah sira?**

The Raktamokshana therapy is advised to perform on Sira containing blood hence vatavaha and kaphavaha sira should be excluded. Rohini sira always contains oxygenated blood hence excluded and Nila sira contains deoxygenated blood so they are included in this chapter.

The study of 4 types of sira should be taken while studying the marma.

Dissection of human dead body:

The present study was carried out in two stages,

- a) Dissection of the human dead body and
 - b) The literature review.
-

Background:

In the diseases of lower limb i.e. diseases pertaining to thigh, tibial region and foot, piercing or cutting or sira are stated as – 4 finger (anguli) above knee joint or knee marma. 2 finger above ankle joint or Gulf marma and 1 finger above the Kshipra marma respectively, preventing any damage to Jaladhara, Aurvi and Lohitaksha so that vaikalya or death can be avoided.

Likewise same thing have been told about upper limb. The diseases of upper and lower limb liable for vedhan or puncture of sira, are described in literature review on page no.

Now, it is necessary to identify and locate the position of Jaladhara, Aurvi and Lohitaksha by dissecting the cadaver. So dissection particularly upper and lower limb have been done and findings are stated under observation and interpretation as below.

Observation and Interpretation:

The dissection of human dead body was undertaken in order to locate the position of Avedhya sira in limb i.e. 'Jaldhara, Lohitaksha and Aurvi' siras. In the dissection of the lower limb it was found that the path and distribution of great sephanous vein resembles the Jaldhara sira. The Jaldhara sira is described by Sushruta as follows -

तासां जालधरा त्वेका ।

Dalhana comments on it as :

जालधरा इति जालानीच जालानि मांससिरास्नाय्वास्थि संधीजातीकूर्च
शिरोव्यापिती तानि धारयन्ति यात्सा जालधरा इत्यर्थः ।

The name Jaldhara is used because the sira forms a network i.e. Jal.

This network covers in the upper part of the limb i.e. thigh.

मांससिरास्नाय्वास्थि संधीजातीकूर्च

शिरोव्यापिती तानि धारयन्ति यात्सा जालधरा इत्यर्थः ।

In the extremities the following veins were contraindicated⁶ for the purpose of venepuncture, i.e. – a) Jaladhara, b) Two urvis, c) Lohitaksa

Jaladhara name is implied for the 'Great saphenous vein' of the inferior extremity and 'cephalic vein' in the superior extremity. (Figure No.1, 2 & 3).

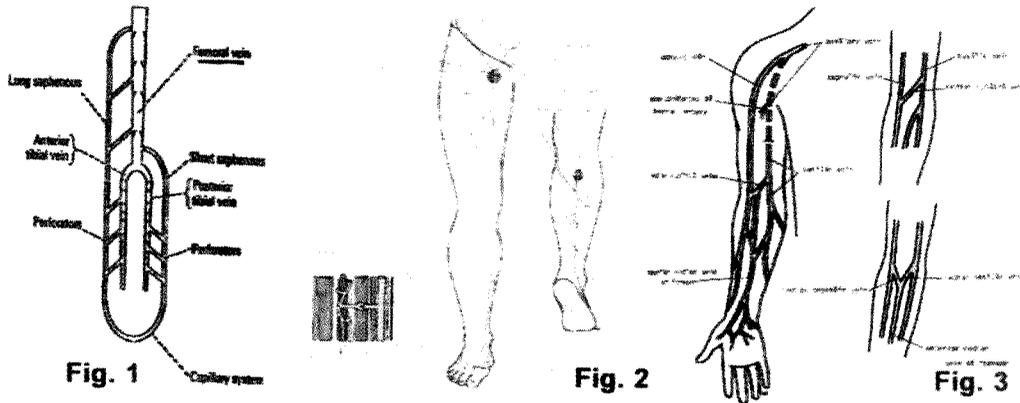


Fig. No.1 There are one hundred siras in one lower extremity. Amongst them one (External) Sira known as Jaladhara and three internal siras, consisting of the two Urvis and one Lohitaksha. - This diagram from synopsis of surgical Anatomy by Mc. Greger Shows the long saphenous veins (Jalandhara) with the three deep veins, i.e. Femoral, Anterior tibial and posterior tibial (Urvis).

Fig. No.2 & 3 Urvis (Femoral) and Lohitaksa (Axillary) Veins are not fit for venepuncture as these are quite large in size and controlled bleeding is difficult, not the upper part of the great saphenous (Jaladhara) in the inferior extremity and its counter part, the caphalic vein(Jaladhara), in superior extremity are fit for the purpose for the reason of back_flow of blood from Femoral and Axillary veins. Veins preferred for venesection were lower part of great saphenous, basilic and median cubital as these are safe and today also blood and fluid infusions are done through them. (Figure adapted from Snell).

If we look at these two veins closely we find some of the factors are common to both. In the first place both these veins are running along the entire length of the two extremities and both are draining into a deep vein of large diameter. Now the question why these two identical veins were contraindicated for the purpose of venepuncture? It appears that both these veins draining into a deep, big veins have more chances of haemorrhage because of back flow from the femoral and axillary veins respectively and may cause fatal bleeding. Both these veins themselves are also big in size and hence contain large quantity of blood in them. To conclude, these veins were forbidden for venesection as controlled bleeding from them appears to be difficult. **Urvis and Lohitaksa** are the 'brachial', 'femoral and 'axillary' veins, where again venesection was not allowed as these veins are placed very deep in the arm, thigh and axilla. In their course all these three vessels are accompanied by the arteries of the same names and nerves. (Figure No. 2 & 3) The axillary vein is surrounded by the brachial plexus and brachial vein has median nerve with it, whereas the femoral artery, vein and nerve are in one bundle in femoral sheath. In case attempt is made to puncture veins at these three sites, it is very probable that the arteries may get involved and injury to an artery of the diameter of femoral, axillary or brachial will bleed so profusely that within minutes patient may bleed to death or if a nerve in the vicinity is injured then the muscles supplied by the particular nerve may get paralysed leading to a permanent disability.

Because of its network like appearance the sira is termed as Jaldhara sira. The great saphenous vein is found to form a network with its tributaries is just like the description of sira around the knee joint. Sushruta indirectly says that the Jaldhara sira is situated superficially since he has used the word "अभ्यंतर" for lohitaksha and Aurvi sira next to Jaldhara sira. The great saphenous vein is the most prominent and superficial vein of the thigh.

Thus all the description of Jaldhara sira matches with the actual position of the great saphenous vein which the great saphenous vein can be termed as Jaldhara sira in lower limb i.e. Adhoshakha.

The femoral vein and femoral artery seem to be Aurvisiras described by Sushruta. Sushruta says there are two Aurvi siras ऊर्मी संज्ञे द्वे and they are situated interiorly. It is also described that both the Aurvi siras lie in relation to one another. Dalhana says.

द्वे अपि ते ऊर्वी संज्ञे अतिसान्निध्यात् ॥ - डल्हण टीका ७/१६, शारीरस्थान

The aurvimarma is situated in Aurvi sira. The femoral vein and femoral artery are the two prominent vessels situated interiorly in the thigh i.e. Sakthi. Hence it seems that the femoral vein and the femoral artery and nerve can be jointly termed as aurvi siras. It is also observed that these vessels supply the whole of the thigh. In the leg, the major vessels like popliteal artery and popliteal vein are in direct continuation of femoral artery and vein. It means the femoral artery and vein can be termed as the major vessels of thigh.

Hence they prove to be 'Avedhya'. Because their damage is most likely to result permanent damage due to severe blood loss as stated earlier. Sushruta says the damage to 'Aurvi' marma causes sakthishosha due to 'shonitkshaya' i.e. blood loss. This statement seems most likely when it is used in case of femoral artery. Sushruta also says that the Aurvi marma is situated in the central part of the thigh. 'ऊरुमध्ये ऊर्वी नाम' here he must be describing the adductor canal in which the two vessels and saphenous nerve are situated. Thus the description of Aurvi siras in Sushruta Samhita can be applied to femoral artery and vein are the two Aurvi siras described by Sushruta.

The important sira is lohitaaksha sira. According to Sushruta lohitaaksha sira is one. Lohitaaksha marma is situated in this sira. And this marma is located

at the “root of the thigh above Aurvi marma below hip joint.”

ऊर्व्या उर्ध्वमधो वंक्षणसंक्षेपमूले लोहिताक्षं नाम..... ॥

This marma is said to be vaikalyakar and the sira is said to be Avedhya. As the damage to this sira and marma results in permanent disability due to lohita-kshaya. It seems that Sushruta is describing the femoral sheath. Because he says that “Lohitaksha” is only one.

लोहिताक्ष संज्ञा च एका ।

The femoral artery and the vein both are enveloped in the femoral sheath forming apparently one vessel. In the lower part i.e. in femoral triangle the femoral artery and vein are separated i.e. when they come out of the femoral sheath they obtain separate identity. Hence in adductor canal i.e. the middle part of the thigh referred above, they get a name Aurvi siras.

From all these description it seems that the femoral artery and vein in the femoral sheath are jointly termed as lohita-ksha sira. The dissection has proved the above statement. The lohita-ksha sira is avedhya sira and lohita-ksha marma is vaikalyakar. This seems to hold true since the damage of femoral artery and femoral vein at the level of femoral sheath is likely to cause the extensive damage due to severe blood loss i.e. lohita-kshaya.

Hence the associated portion of femoral artery and femoral vein in the envelop of femoral sheath may be jointly called as “Lohita-ksha sira.”

In the upper limb i.e. urdhva also, jaldhara, lohita-ksha and aurvi siras are located.

The course and the distribution of the cephalic vein the whole upper limb resembles the description of jaldhara sira in Samhita granthas. The network of the cephalic vein is found around the fossa. The cephalic vein as described earlier sends a communicating vein to the basilic vein. Cephalic vein and basilic vein

are the two largest veins of the upper extremity. Both these veins begin from the venous arch on the dorsum of the hand. The cephalic vein is found at the lateral side of the wrist running upwards superficially along the lateral side of the forearm. It ascends on the lateral aspect of the arm and finally terminates in axillary vein behind the clavicle while the basilic vein runs along the ulnar border of the forearm crossing on the medial side in front of the elbow. It ascends along the medial aspect of the arm.

It pierces the deep fascia to join the deep veins. The cephalic and basilica vein are connected by median cubital vein in front of the elbow. The cephalic and basilic veins being largest can be considered for being called 'Jaldhara Sira'. But among these two veins the course and the distribution along with the location of cephalic vein matches the description of jaldhara sira in sushruta Samhita. Because the cephalic vein is situated more superficially than basilica vein.

According to Sushruta 'Jaldhara sira' is situated superficially. It forms a Jal i.e. network. The cephalic vein also forms network by its branches and tributaries in the whole upper arm. The cephalic vein is a representation of a great sephanous vein in the lower limb. Hence cephalic vein is the vein which can be called 'Jaldhara sira' in the upper limb i.e. urdhava shakha.

Regarding the lohitaaksha sira, the course and distribution of the axillary artery matches the description of lohitaaksha sira. The axillary artery is located in the Axilla, at the medial border of coracobrachialis. Axillary vein is situated besides the axillary artery along with Axillary nerve.

Axillary artery is enveloped in a funnel shaped sheath along with the Axillary vein and Brachial plexus just like in case of 'femoral artery - vein - nerve' are enveloped in the femoral sheath in the lower limb. Damage to this part of the sheath where Axillary artery, Axillary vein and Brachial plexus are located results in a permanent damage to the upper limb due to excessive blood loss. Hence

this must be the place where 'Lohitaksha sira' is located in a sheath.

Since the distribution and the course of Axillary vein and axillary artery resembles the description of the 'Lohitaksha sira' in Sushruta Samhita and these vessels represent the sheath in lower limb. Hence the Axillary artery and Axillary vein enveloped in a sheath can be called 'Lohitaksha sira' of the Samhita.

The Aurvi siras in the Adhoshakha are represented in 'Urdhava shakha' also. The name Aurvi is related to the word 'Uru.' Aurvi means situated in 'Uru'. That is why, according to some commentators, the name Aurvi sira should not be used in reference to sira located in the arm. i.e. 'Bahu' in fact these siras should be called 'Bahvi siras' in upper arm i.e. in Urdhva shakha. Brachial artery and Brachial vein are the two vessels, which are located interiorly in the upper arm i.e. 'Bahu'. These two vessels send many branches and tributaries in the upper arm. Any damage to these vessels, result in the heavy blood loss leading to permanent disability in the upper limb. The course distribution and location of the Brachial artery and vein resembles the description of the 'Bahvi' in Urdhva shakha, i.e. Aurvi, in Adhoshakha in the Samhita granthas. That is why the Brachial artery and Brachial vein can be termed "two bahvi siras" as 'Aurvi' "ऊर्वी द्वे" in adhoshakha.
