

## TECHNIQUES OF VENUPUNCTURE (*ŚIRĀVEDHA*) IN INDIA IN 18TH CENTURY

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The story of venupuncture (*śirāvedha*) technology opens with the name of Suśruta, who occupied the most important chair in the history of Indian Medicine. He was the father of this specialised technique of blood letting (*raktavīsrāvana*). Later on the blood letting technique was learnt by Arabic and Persian surgeons too. The technique was adopted by army surgeons also for treating war inflicted soldiers, during Mughal India.

This technique, discovered by Suśruta and adopted by surgeons of medieval India became a highly developed and skilled technology in eighteenth century. In the present day it is the easiest and most convenient method of obtaining adequate volume of blood, suitable for a variety of pathological tests. The samples of the blood collected by the venupuncture method is now treated according to the prescribed investigations demanded by the physicians and surgeons. The blood is also used for plasma and whole blood transfusion to the demanding patients.

The venupuncture (*śirāvedha*) technique was undertaken only by experienced operators who had the patience and skill necessary to avoid causing discomfort to the patients.

### THE ANATOMICAL SITES OF VENUPUNCTURE (*SIRĀVEDHA*)

The technique was usually performed on the superficial veins, lying subcutaneously. Though the knowledge of surface anatomy of superficial veins was not clearly known to the surgeons of eighteenth century, the veins which are prominent and easily located and palpated were the site of choice for this technique. The following veins were usually selected.

1. Veins of the foot (*kṣīpra marma*).
2. Veins of the leg (*īndrabastī*).
3. Veins of the chest.
4. Veins of the back.
5. Veins of the genitalia (*medhṛa*).

6. Veins of the sacral region (*trika*).
7. Veins of the head and neck, particularly at the centre of the mandibular joint.
8. Veins of the outer canthus (*apāṅga*).
9. Veins of the under surface of the tongue.
10. Veins of the root of auricle.

Later on, as the knowledge of Anatomy advanced, the following veins were selected as the site of choice for Venupuncture (*śirāvedha*).

1. Ante cubital veins.
2. Veins of the back of the hand.
3. Veins of the head.
4. External jugular veins.
5. Sub-clavian veins.
6. Anterior tibial veins.
7. Posterior tibial veins.

#### PRE-VENUPUNCTURE PREPARATION

तत्र स्निग्धरिवन्तमातुरं यथा दोष प्रत्यनीकं द्रवप्रापमन्नं  
मुक्तवन्त यवागू पीतवन्तं वा यथाकालमुपस्थाप्यासीनं  
स्थित्वा प्राणानवाधमानो वस्त्र पटटन्वर्मातिर्बलक ललतानाम  
न्यतभेन यन्त्रापित्वा नातिगाडं नातिशथिलं शरीर प्रदेशमासाद्वयप्राप्तं  
शस्त्रमादायं सिरां विध्येत् ॥

शु०शा० 8/6

The patient was first of all allowed to undergo oleation (*snehan*) and sweating (*swedan*) treatment. He was given a liquid diet and then made to sit or stand in a position which does not interfere with vital functioning of life. The proximal portion of the site of venupuncture was ligated by cloth, like a towel or dhoti or by a rope or skin or anything alike. It was tied neither too tight nor too much loose. The vein should then be duly opened with an appropriate sharp instrument.

#### THE CHOICE OF SEASON AND TIME

The venupuncture (*śirāvedha*) was performed in a moderate climate, that is neither extremely cold, or hot nor an airy day. The ideal time for venupuncture was a little before midday (*madhyāhna*). Even Suśruta had suggested a similar season for venupuncture (*śirāvedha*).

व्यथे वपासु विध्येन्तु ग्रीष्मकाले तु शीतले ।

हेमन्त काले मध्याह्ने शस्त्रकालस्त्रयः स्मृता ॥

शु०शा० 8/10

The cloudless day in the rainy season, a cool day in the summer season and in the noon during winters were supposed to be the days of choice for the venupuncture (*The Anatomical and Obstetrical considerations in Ancient Indian Medicine* by Guru and Singhal of B. H. U.).

POSTURE

The posture for venupuncture depended upon the site or the parts of the body and the vein of which was to be punctured.

तत्र व्ययं त्रिं पुरुषं प्रत्यादित्यमुखमूर्त्तिं मात्रेच्छित्ते  
उपवेश्यांसने सवथनोरा कुञ्चितयोर्निवेश्य कूपरे  
सन्धिं द्वयस्योपरि हस्तावन्तर्गुं द्वाङ्गुष्ठकृतं मुष्टौ  
मन्देपीःस्थापयित्वा यन्त्रणशाठकं ग्रीवासुष्ठौ  
सपरि पारिक्षिप्यान्येन पुरुषेण पश्चात्तिथतेन  
वामहस्तेनोत्तानेन शाठकान्तं द्बयं प्राहयित्वा  
ततो द्रुयात-दक्षिण हस्तेन सिरोत्थापनार्थं  
नात्यायत शिथिलं यंत्रमावेष्टयेति, असृक्त्वावप्यार्थं च  
यंत्रम पृष्ठमध्ये पीठयेति, कर्मपुरषं च बायु-  
पुणेमुखं स्थाषयेत-एपंडत्तमाङ्गतानामन्त  
सुखं जानां सिराणां बन्धने यन्त्रणविधिः ।

सु0शा0 8/8-1

In cases of venupuncture in the head and neck region, the patient was made to sit on a high stool facing the sun. He was asked to keep his leg flexed keeping the elbows on the knee joints, the hands with thumbs closed in his fists were kept on the region of the jugular veins (*manyas*). A cloth should then be put around the neck and the fists of the patient by an assistant standing behind, who caught hold of the two ends of the cloths by his supinated left hand. The surgeon then asked the assistant to tie the bandage with his right hand around the part (neck and fist of the patient), neither too tight nor too loose in order to make the veins prominent and then press the cloth (bandage) towards the back for a good outflow of blood. The patient was asked to blow with his mouth closed and venupuncture (*śirāvedha*) performed appropriately. (By Guru & Singhal of B. H. U.).

पादव्यध्यसिरस्य पादं समे स्थाने त्सुस्थितं स्थापयित्वा  
दन्यंपादमोषत्संकुञ्चितं मुचचैः कृत्वा व्यध्यसिरं पादं  
जानु सन्धेरथः शाठकेनवेष्टय हस्ताप्यां  
प्रपांड्य गुलकं व्यत्रएदेशस्योपरि चतुरङ्गुले  
प्लोतादीनामन्यतमेन बाधा वा पादसिरां विष्येत् ।

सु0शा0 8/8-2

Venupuncture of the leg: In this case the vein to be opened was placed on an even surface while the other leg was kept slightly flexed and held at the higher level. Then the leg to be venupunctured was tied with a cloth below the knee joint and the ankle was pressed with the hands or else a ligature of cloth should be tied, four fingers above the site of venupuncture.

अधोपरिध्ठादधस्तौ गुदाङ्गुष्ठकृत सुष्टो, सम्यगासने  
स्थापर्यत्वा सुखोपविष्टस्य पूर्ववदयन्त्र वदध्वा  
हस्त सिरां विध्येत् ।

सु०शा० ८/८-३

Venupuncture in the arm was done on the patient by making him to sit comfortably on an appropriate support and placed his hands with the thumbs inside the fist. Then a ligature, as mentioned before, was tied and the vein opened.

गृध्रसोविश्वान्तयेः सङ्कुञ्चित जानुकूर्परस्य

सु०शा० ८/८-४

In the sciatica (*gradhrasi*) and brachial neuralgia (*visvaci*) diseases the venupuncture was made by allowing patient to make his knees or elbow joint flexed.

श्वीणोपृष्ठस्केधैनुन्नामित पृष्ठस्य वाक्शिरस्कस्ये-  
पविदनस् य विस्फूर्जित पृष्ठस्य विध्येत् ।

सु०शा० ८/८-५

In the case of venupuncture (*śirāvedha*) in the region of the hip, back and shoulder, the patient was made to sit with his back raised and extended, with the head flexed and then the veins of the back, hip and shoulder were opened.

उदरोस्सोः प्रसारितोरस् क स्येन्नामितशिरस्कस्य  
विस्फूर्जित देहस्य :

सु०शा० ८/८-६

Venupuncture in the regions of abdomen and chest was made in a patient, with an expanded chest, body in extension and the head raised.

बाह्म्याम् बलम्बमान देहस् य पार्श्वयोः ।

सु०शा० ८/८-७

Venupuncture in the sides of the trunk was conducted by keeping both the arms hanging on the sides of the body of patient.

अनामितमेदस्य मेद्रे ।

सं०शा० ८/८-८

For the Venupuncture in the Penile veins, the penis was made erect.

उन्नमितविदष्टजिह्वागस्याधो जिह्वायाम् ।

सु०शा० 8/8-9

For the Venupuncture in the sublingual veins, the tongue was turned up-wards and held firmly by the teeth.

अतिन्यान्तानस्य तालुनि दन्तमले षु च ।

सु०शा० 8/8-10

The palatine venupuncture was done by keeping the mouth cavity fully opened.

#### INSTRUMENTS

मोसलेश्ववकाशेषु यवमात्रं शस्त्रं निदध्यात् ,

अतोऽन्यथात्थयवमात्रं बृहिमात्रं वा व्रीहिमुदवेन.

अस्त्रनामुपरि कुटारिकया विध्येदर्थयवमात्रम् ।

सु०शा०-8/9

In a fleshy part the instrument should be introduced as deep as the measure of a barley ; in a less fleshy part the puncture ought to be only as deep as half the measure of barley or equal to a *vrihi* with a *vrihimukha* instrument. On the bony surfaces puncture with a *kuṭhārikā* should be done as deep as half of a barley (By Guru & Singhal of B. H. U.).

#### 1. *Vrihimukha* :

An instrument whose top is equal to a grain of a rice (*vrihi*) is known as *vrihimukha*. This instrument was introduced in a fleshy part, as deep as a measure of a barley but in a lesser fleshy part the puncture was done only as deep as the half of the measure of a barley.

#### 2. *Kuṭhārikā* :

This was an axelike instrument. With the help of this instrument the deep puncture of size of half of the barley was done over the bony surfaces.

#### 3. *Cow horns* :

A small piece of cloth was tied around the pointed end of the horn. This end was kept in the operator's mouth to suck the blood whereas the other broad end was kept on the body parts at the point of opened vein.

4. *Leeches (jalauka)* : Application of leeches was the safest method of blood letting. It was a painless job and was very much useful in infants and old persons or where the patient was too weak to stand any surgical intervention. The site where the leeches were to be applied was abraded by rubbing a mixture of dust and cow dung on the surface. The leeches were taken out of their

receptacle, sprinkled over with water containing mustard seeds and turmeric powder, and kept in a basin full of water so that they become fresh and vigorous. They were then applied to the affected part. If they failed to stick on to the desired spot, a small incision was made to let the blood come out. While sucking blood, the mouth of the leeches assumed a horse-shoe shape and their necks became raised and arched. Cold water was sprinkled over the leeches occasionally while they were sucking the blood.

#### INDICATIONS

The blood letting was performed mainly in the following conditions in those days :

(1) Abscesses (*vidradhi*), (2) enlargement of spleen (*plihodar*), (3) inflammation of the body parts (*śoṭha*) (4) evacuation of the plethora of blood, (5) to relieve pain (*śūla*), the vein which was punctured was as near as possible to the site of pain (6) to allow free movement of the blood for the vital spirit of the part, (7) for chronic headache like migraine (*ardhāvabhedaka*) (8) intra-ocular tension (*adhimantha*) (9) head tumours, (10) swellings of the neck (*gala-gaṇḍa*), (11) sciatica (*gradhrasi*), (12) hydrocele (*mūtra vṛdhri*), (13) ascites (*jalodar*), (14) hydrothorax (*urasṭoya*), (15) varicose veins, (16) filariasis (*slīpad*), and (17) hæmatomas (*raktārbuda*) etc.

#### CONTRA-INDICATIONS

बालस्थविररुक्ष क्षतक्षीण भीरुपरिश्रान्त मद्याशहवस्त्रो—  
कर्मितवमित विरक्तास्थापितानुर्वासित जागरितकलीबकृश  
गभिणीनां कासश्वासशी पृष्टुद्रपक जनरादोपक पक्षाघाती  
पवासार्पया सामूच्छप्रपीदितानाम च सिरां न  
विध्येत्, पाश्चाध्यभ्यां, व्याश्वाह्व्याः, दृष्टाश्चा  
यंत्रिताः, यन्त्रिताश्चानुत्थिता इति ॥

सु0शा0-3/3

The blood letting was prohibited for the following : (1) Infants (2) very old persons, (3) very weak persons (4) fatigued, emaciated and starved persons, (5) in the persons having weak will power, (6) patients treated with purgatives and emetics, (7) patients suffering from insomnia, impotency, emaciation, chronic cough, hyperpyrexia, tuberculosis, diabetes, severe anaemia etc.

#### PROCEDURE OF VENUPUNCTURE

सिरासु शिक्षितोनास्ति चला ह्येताः स्वभावतः  
मरस्सवत् परिवर्तन्ते तस्माद्यत्नेन ताडयेत् ॥  
अज्ञानता घृहोते तु शस्त्रे कायनिषातिते ।  
भारान्ति व्यापदश्चेता बहवश्चाप्युपद्रवाः ॥

सु0शा0-8/20

The Surgeon who was to perform venupuncture should be a perfectly trained person, because the veins are very slippery.

The procedure of venepuncture was done only by perfectly trained and skilled persons, known as Phlebotomists. The Phlebotomists practised not only the art of blood letting but also the art of circumcision. They were supposed to have thorough knowledge of superficial veins and their relations with internal anatomy of body. The surgeon was supposed to know how much vitiated blood may be allowed to drain so that the patient may get relief. The ideal venupuncture had the following criteria.

सम्यक् शस्त्रनिपातेन धारया या सुवेदस्यत ।  
 सुहृत् रूद्धा विष्टेचच सुविद्धा तां विनिदिशेत ।  
 यथा कुसुम्भपुष्पेभ्यः पूर्वं सृवति पोतिमा ।  
 तथा सिरासु विद्धासु दुष्टमरो प्रवर्तते ॥

सुशा०-८/११-१२

With the proper use of instruments the blood flows in a stream for sometime and stops bleeding when checked. The vitiated blood in the beginning flows from the punctured vein just as yellow juice oozes out of the flowers of *kusumbha* on plucking. (By Guru and Singhal of B. H. U.).

The technique for obtaining blood gradually changed and was later on improvised with the uses of conventional syringes or evacuating tubes. A dry sterile syringe of a medium length fixed with a short needle was used. The patient was then placed in a comfortable posture in which he or she could hold the selected site of venupuncture, without fatigue. Care was always taken to avoid attempting to take blood in a sitting posture without any support. Disinfectants, like alcohol and spirit on the skin over-lying the area were swabbed. In the absence of disinfectants the part was thoroughly washed by hot water. Then a tourniquet or ligature was applied to make out the vein prominent. Back of the venupuncture site was grasped to draw the skin slightly over the vein, the needle or the lancet was inserted parallel to the course of the vein and then the pointed end of the instrument was advanced half to one cm., into the subcutaneous tissue and then pierced the vein wall. The blood began to flow outwards spontaneously.

The experienced and confident technologists freely applied the tourniquet. As soon as the required amount of the blood was taken out, the tourniquet was released.

The puncture made by a thin instrument which did not permit to allow the proper flow of the blood with pain and inflammation, the puncture was known as *durvidha* (bad punctured), the puncture of a bigger size causing haematoma or

excessive haemorrhage was called *atividdha* or bad punctured, (the crooked *kuñcita* puncture) had similar features. The other defective punctures were known as *picchita* or crushed, *kuṭṭita* or lacerated etc. . Suśruta has enumerated twenty types of such defective punctures. The phlebotomists took all care to avoid the complications during venupuncture on slippery veins.

#### AFTER CARE

Anger, hard work, sexual indulgence, physical excercises were strictly prohibited till the complete recovery of the patient. The patient was given a good nourishing diet and rest after venupuncture.

#### CONCLUSION.

From the above description regarding the technology of venupuncture we can safely conclude that the venupuncture is an old scientific surgical device, which evolved from Suśruta's period and was much advanced in the 18th and 19th century in India. It was supposed to be one of the best surgical technique, to relieve people from a number of acute and chronic surgical and medical problems.

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