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CONCEPTUAL STUDY OF SIRA VYADHA WSR TO SUSHRUT SAMHITA

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ABSTRACT

Ayurveda is not only science of medicine but also the way of life style. It is well organized system of medicine that has unique techniques for harmonious living. It is not a stagnant one. It was developing throughout its history. The science of Ayurveda has glorious past with extra-ordinarily enriched documentation of medical literature. That is nothing but experience and observations of ancients. Shodhana chikitsa has great importance. Expulsion or removal of vitiated blood from the body is known as Raktamokshana. This can be done either through the prominent superficial veins with the help of simple scalp- vein canula (Siravyadha), with the help of Leech (Jalukavacharana), by taking multiple incision on a particular site (Prachana Karma), by sucking blood with the help of animal horn (Sringa) from the site where prior incision is taken or removing blood with the help of empty dried bottle gourd (Alabu). Raktamokshana or bloodletting is given prime importance in panchakarma or Sodhanachikitsa . It is said that a number of diseases which are otherwise incurable can easily and effectively be cured only by Raktamokshana alone.

KEY WORDS: Sira, Sira Vyadha, Raktha Mokshan.

INTRODUCTION

The science of Ayurveda has glorious past with extra-ordinarily enriched documentation of medical literature. That is nothing but experience and observations of ancients. . In real sense, Rachana Shareera is the media either to plan for treatment or to achieve the ultimate aim of life. Hence the fundamental concept of Rachana Shareera has become basic necessity for both physician and surgeons. That too specially in pre-clinical studies. Acharya Susruta has mentioned diseases that are not relieved so quickly by snehana, swedanadi measures, in this situation; Siravedha is an emergency management to achieve better results. Rakta, the blood being the vehicle to carry and transport absorbed nutrients, oxygen, metabolites etc. from place to place. So, correction of any abnormality in the blood by taking it out solves a number of problems.

Sira Sharir

Sira shabda is derived from Sru+ka+taap = Sri which means Raktavahini Nadi.

Sira – Any tubular vessel of the Body

Sira – A Nerve, Vein, Artery, blood vessel (Sanskrit-English Dictonary)

In **Atharva Veda** there is a reference regarding the flow of blood. The simile of small tributaries of water joining to form big ocean is mentioned to describe the network pattern of *Sira*, *Dhamani* etc. This describes about the formation of big *Sira* by the union of small *Sira*. These *Sira* have different colours like *Aruna*, *Lohini*, *Tamra* and *Dhumra*. It moves throughout the body upward, downward and obliquely, this shows the extent of the network of blood vessels in the body.

In ***Charaka Sutra Sthana*** **30th chapter** there is the description about three structures in succession for better understanding and differentiation between them, which are similar in many aspects. They are *Dhamani*, *Srotas* and *Sira.*

- The structure which pulsates in the body when filled up with the nutrient material is termed as *Dhamani.*
- The structure where there is the process of transudation to supply the nutrient material to the tissues is termed as *Srotas*
- The channels that belong to the third category, which carry or transport the substances from one place to another. They do not pulsate nor do the process of transudation are termed as *Sira.*

In ***Sushruta Samhita*** there is a detailed description of *Sira, Siravyadha* and *Avedhya Sira*. In *Sushruta Shareera Sthana* seventh chapter there is the detailed description of *Sira* and *Avedhya Sira*. In this chapter there are details about the *sankhya*(number), *moola sthana*(seat), *prasara*, branching pattern of *sira*, distribution of *sira* in the *Sakthi*, *Bahu*, *Kostha* and *Urdhwa gatha*. Description regarding the function of *Vatavahini sira,Pittavahini sira,Kaphavahini sira* and *Raktavahini sira.*There is also the description available for the colour of different types of the *sira*. In the eighth chapter of *Shareera Sthana* there is detailed description of the procedure of venesection, its protocol, benefits and results.

There are seven hundred siras. As a garden or a field is irrigated by the water carrying channels and every part receives nutrition, similarly the Siras by their contraction and dilatation, etc. provide nutrition to the body as like Kedarkullya Nyaya.

Astanga Samgraha

- There is the reference about the *Moola sira* with their function.
- There is the description regarding the branching pattern of the *sira*.

Enumeration and distribution of *sira.*

- Description regarding the number and location of *Avedhya Sira* of different parts of the body.
- Various characteristics of different types of *sira*.

Utpatii of sira

There are seven hundred veins (siras). As a garden or a field is irrigated by the water carrying channels and every part receives nutrition, similarly the siras by their contraction and dilatation , etc. provide nutrition to the body as like Kedarkullya Nyaya. Their branches are just like the veins on a leaf. The site of origin of the veins is umbilicus and from there they spread upwards, downwards, and obliquely. All the veins of the body have their attachments with the umbilicus from which place they spread in all directions.

Sira Swaroopa

According to Acharya Susruta, Mula Sira (root veins) are forty in number; out of these, ten carry Vata,ten carry Pitta, ten carry Kapha and ten carry Rakta (blood).

The ten vata carrying siras (veins) on reaching the seat of vata (i.e Pakwasaya), divide themselves into 175; pitta carrying sira divide into the same number in the seat of pitta (i.e Aamashaya); kapha carrying sira divide into the same number in the seat of kapha (i.e Uras); rakta carrying sira divide into the same number in Yakrit and Pleeha. Thus all these together make up 700.

Vata vaha sira are light red in colour and filled with vata; pitta vaha sira are warm and blue in colour; kapha vaha sira are cold,white in colour and srable; rakta vaha sira are red in colour and neither very hot nor very cold (moderately warm. There are 25 vatavaha siras in one sakti. Same number i.e 25 siras is presented in all 4 extremities, and in total 100 siras present in extremities. There are 34 vatavaha siras in Kosta (trunk); out of these 8 are found in Guda, Medra,Sroni, 2 siras in each Parshwa(flanks), 6 in prusta (back), 6 in udara (abdomen), and 10 in vaksha (thorax).There are 41 siras above the jatru (clavicle). Out of them 14 in greeva,4 in karna,9 in jeevha,6 in nasika,8 in netra. Thus in total 175 vatavaha siras are distributed in all over the body.
Only in case of pitta vaha sira especially, 10 are present in the eyes, 2 in the ear.
Similarly also of raktavaha and kaphavaha.

Vedhya and Avedhya siras

In our classics siras have been explained as vedhya and avedhya siras. In which vedhya siras are those which can be punctured for bloodletting with surgical process. They don't have no serious complications when punctured. To get relief from certain diseases these veins are only safer for the bloodletting.

Avedhya siras are those which are prevented during different surgical process and also these are not at all indicated for the bloodletting because accidently if any injury will occur to these that may lead to deformity or certain times Marana.

In samhita kala Acharya Caraka also mentioned about vedhya siras while explaining the Unmada and Apasmara in his Chikitsa sthana 9th chapter as, bloodletting therapy should be administered by vene-section, at the joint of the hair line (keshanta pradesha) and temporal region (shankha pradesha), which is useful in the treatment of Unmada (insanity), Visham Jwara (irregular fever) and Apasmara (epilepsy). While the school of susruta explains in detail about siras and in that only he explained vedhya and avedhya siras separately with their numbers and given importance to siravedha.

Astanga hrudayakara too mentioned about vedhya siras in relation to treatment of diseases like susruta but he was not specified the particular sira which is to be punctured to a particular disease but he specified that siravedhana has to be done based on roga adhisthan and their the sira should be visible. He also mention the number of avedhya siras but his concept is that, along with 98 avedhya siras which are mention by susruta, those siras which are oblique, short, tortuous, narrowly placed and which are located in joints should also included in the avedhya siras.

Avedhya siras is relation to sira Maramas

1]Bahvi: This is an Avedhya sira as well as a sira Marma situated in the middle of arm. Injury to this causes atropy/ wasting of muscles of the arm because of losse of blood. It is a Vaikalyakara Marma.

Vagbhata, Dalhana, Indu, and Arunadatta have followed susruta. Dr.B.G.Ghanekar has considered the probabilities of the hypotrophy of the muscles on injury to midline of arm, the brachial artery and median and ulnar nerve are the responsible structures. He has also stressed that injury to brachial artery may develop blood loss and median and ulnar nerves may develop Atropic Paralysis of the upper limb.

2]Lohitaksha: This is an Avedhya sira as well as a sira Marma situated above bahvi marma and below kakshadhara sandhi (shoulder joint). On injury to this causes paralysis of muscles or wasting of the sakti (upper limb) due to loss of blood. It is a Vaikalyakara sira Marma.

Vagbhatta, Indu, Dalhana, and Arunadatta have followed susruta. Lohitaksha Marma involves the brachio-axial segment of the vessels.

Jaladhara, urvi, and lohitaksha are avedhya siras in lower extremities comes under the same name and descriptions. According to susruta there are 400 siras in extremities, but only 4 siras in each limb are Avedhya. Jaladhara situated externally is one in each extremity, 3 internal siras (2-Urvi and 1-Lohitaksha), thus totally 16 avedhya siras in extremities.

This opinion does not appear to be different in terms of Modern surgery. B.G Ghanekar suggest Jaladhara- for great Saphenous and Cephalic veins, Urvi and Lohitaksha- for Femoral artery and vein, Axillary artery and veins.

Avedhya siras denote prohibition of Siravyadha, if they undergo trauma due to surgery or injury, they may produce pathological conditions.

According to modern aspect

During the Roman Empire, Galen put forward the method of physician induced bloodletting. The two key concepts of bloodletting at that time were that the used up blood stagnates and produces disease. Second was that of humoral balance which was the basis of homeostasis and illness. Hence for attaining homeostasis, the physician balances the humours by bloodletting. This procedure became well known in Latin speaking countries of Europe through the Islamic physicians who probably have learnt it from the Greeks.

Phlebotomy

Phlebotomy is derived from a Greek word which means to cut. It is the procedure of making an incision in the vein. It is associated with venepuncture, which is the process of collection of the blood samples from veins for diagnostic purposes.

Today also bloodletting is used in the treatment of some diseases, such as haemochromatosis and polycythemia.

Description of Blood vessels in detail according to Modern Science

Introduction

- Blood vessels form the transport system of the body, through which the nutrients are conveyed to places where they are utilized and the metabolites (waste products) are conveyed to appropriate places from where they are excreted.
- The conveying medium is a liquid tissue, the blood which flows in tubular channels called blood vessels.
- The circulation is maintained by the central pumping organ called the heart.

Artery

- The arteries are distributing channels which carry oxygenated blood away from the heart. *Aorta* is the largest artery.
- They branch like trees on their way to different parts of the body.
- The large arteries are rich in elastic tissue, but as branching progresses there is smooth muscle in their walls.
- The minute branches which are just visible to the naked eye are called arterioles.

Characteristic features

- Arteries are thick walled, except the arteries within the cranium and vertebral canal are thin.
- Lumen is narrow.
- Valves are absent.
- An artery is usually accompanied by vein, nerve and lymphatics. All of them form neurovascular bundle which is surrounded and by a fibroareolar sheath.

Types of artery

1. Large arteries of elastic type- e.g. Aorta and its main branches.
2. Medium and small arteries of muscular type- e.g. Radial, ulnar, femoral, popliteal, etc.
3. Smallest arteries of muscular type called arterioles- They measure 50-100 micron in diameter. Arterioles divide into terminal arterioles with a diameter of 15-20 micron, the side branches from terminal arterioles are called as metarterioles, the terminal narrow end of metarteriole is surrounded by a precapillary sphincter which regulates the blood flow into the capillary bed. The muscular arterioles are responsible for regulating the diastolic blood pressure.

Histology

Arteries are composed of three coats.
1. Tunica intima- the inner coat.
2. Tunica media- the middle coat.
3. Tunica adventitia- the outer coat.

Blood supply

Large arteries are supplied with blood vessels.
- They are known as vasa vasorum.
- They supply adventitia and outer part of tunica media.

 The rest of the vessel wall i.e, inner part of tunca media and tunica intima is nourished directly by difussion from the luminal blood.

Nerve supply

 The nerves supplying an artery are called nervi-vascularis.

Vein

 The veins are draining channels which carry deoxygenated blood from different parts of the body to the heart.

 Like rivers, the veins are formed by tributaries.

 The small veins (venules) join together to form larger veins which in turn unite to form great veins called venae cavae.

Characteristic features

 Veins have thin wall.

 The lumen is wide.

 Veins have valves which maintain the unidirectional flow of blood, even against gravity.

 Valves are absent in veins of less than 2 mm diameter, venae cavae, hepatic, renal, pulmonary, uterine, ovarian, cerebral, spinal and umbilical veins.

Histology

Veins are composed of three coats.

Tunica intima- the inner coat, it consists of endothelium.

2. Tunica media- the middle coat. It forms one-third of the thickness of the wall of the vein.

3. Tunica adventitia- the outer coat. It forms two-third of the thickness of the wall of the vein.

Blood supply

Large veins are supplied with blood vessels.

 They are known as vasa vasorum.

 They penetrate up to the tunica intima, probably due to low venous pressure and low oxygen tension.

Nerve supply

 The nerves supplying a vein are called nervi-vascularis.

Region wise number of *Vedhya* and *Avedhya Sira* according to *Sushruta Samhita, Astanga Samgraha* and *Astanga Hridaya*

Sr no.	Region	Number	Vedhya	Avedhya
1	Sakha	400	384	16
2	Koshta	136	104	32
3	Jatrurdhav	164	114	50
	Total	700	602	98

Avedhya sira

The importance of *Avedhya sira* is mentioned in *Sushruta Samhita, Astanga Samgraha* and *Astanga Hridaya*. Out of seven hundred *sira* in the body ninety eight are considered as *avedhya sira*. They are distributed as: 16 out of 400 in *Sakha*, 32 out of 136 in *Kostha* and 50 out of 164 in *Urdhwajathrugatha*.

Kosthagatha avedhya sira* by *Sushruta

 In *udara* (abdomen region) among 24 *sira* 4 should not be punctured, they are the *Medhropari romaraji sira* which are situated above the penis over the abdomen on the sides of the pubic hair.

 In *vakshas* (thorax) there are 40 *sira*, among them 14 should not be punctured.

 In *sroni* (pelvis) there are 32 *sira*, among them 8 should not be punctured, they are two in each *vitapa* and two in each *katikataruna*.

 In *parsva* (flanks) there are 16 *sira* and among them 2 should not be punctured.

 In *pristha vamsa* (back side of the body) there are 24 *sira*, among them 4 should not be punctured.

Venipuncture is the process of collecting or “draw- ing” blood from a vein and the most common way to collect blood specimens for laboratory testing. It is the most frequent procedure performed by a phle- botomist and the most important step in this proce- dure is **patient identification**.

Procedure for drawing blood

1. Assemble equipment. ...
2. Identify and prepare the patient. ...
3. Select the site. ...
4. Perform hand hygiene and put on gloves. ...
5. Disinfect the entry site. ...
6. Take blood. ...
7. Fill the laboratory sample tubes. ...
8. Draw samples in the correct order.

CONCLUSION

‘Conceptual study of Sira Vyadha wsr to Sushrutha Samhita’ was undertaken to clear the concept about Sira and Vedhya and Avedhya Sira . Sira was studied and correlated with anatomy of vein and the important Vessels mainly venules, arterioles, sinusoids etc. The Total number of Siras are explained as 700 by Acharya Sushruta. Out of these 602 are considered as Vedhya Siras and 98 are considered Avedhya Siras. When we study these Avedhya Siras Acharya mentioned the important structures present very near to this Sira should also be considered.

All these Avedhya Siras are related with important Marma as Mamsa, Sira, Snayu, Asthi and Sandhi should be considered when performing the puncturing of veins. In modern Medicine Phlebotomy is now an Important branch where the vein puncture can be carried out to draw blood. Now- a days Blood Transfusion and Blood

Donation is also a type of letting of blood at proper timing to serve others as well as to serve himself procedure. Very well conducting and carried out as the way Ayurveda Acharyas was performed early.

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