

CORRELATIVE STUDY OF GREEVAGATA AVEDHYA SIRA AND SIRA MARMA- A REVIEW

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ABSTRACT

Acharya Sushruta has described various basic concepts of *sharira* which are useful while performing any surgical procedure. Out of these concepts, *Avedhya sira* and *Marma –vigyan* are very important to become a skilled surgeon. In Ayurvedic text, the term *sira* is used to denote different structures like vein, artery or nerve. In *greeva* (*neck) 16 *avedhya siras* and 12 *sira marmas* are described. But it is not mentioned clearly which particular structure should be considered or which anatomical structure should be located or protected while performing a surgical procedure. Also a lot of confusion is there about the exact consideration of particular *sira* (vein) at that site. So in the present study, a comprehensive study of both the concepts of *avedhya sira* and *sira marma* is done and their correlation can make the surgical as well as clinical views clear.

Key words: *Avedhya Sira, Sira – Marma, Greeva, pranayatana*

INTRODUCTION

Ayurveda is known for its basic concepts which are unique and very useful in the modern era. These concepts are described in *Sushrut Samhita sharira sthana* elaborately which gives the detail information of the body. *Acharya Sushruta* has described *sharira* and other structures very minutely after performing *mritashodhan* (i.e. dissection). The *sira* was described as per color, originating point, functions, etc. So as per, *Sushruta, siras* are 700 in numbers¹. Sometimes the term *sira* is used in different context at different places for any vessels like

nerve, artery, lymphatic. Similarly another unique concept is *marma sharira* which is no doubt a very important and useful concept for modern surgeon and physician. Knowledge of both the concepts gives complete success while performing surgical procedures. As in modern anatomy, the structure described at particular place is doubtlessly clear and there is no confusion of that particular term, however is not found in the ancient text about the term *avedhya sira*.

Aim & objectives

The present study is planned to fulfill the following quest.

Aim:-To correlate *greevagat avedhya sira* and *sira marma*

Objectives:-

- (1) To study the *greevagat Avedhya sira* described by *Acharya Sushruta* and
- (2) To study the *greevagata sira-marma*.
- (3) To find out the correlation between *greevagat avedhya sira* and *sira marma* with the help of modern anatomical study.
- (4) To come to conclusion of exact anatomical structures denoted by *greevagat avedhya sira*.

Material and Method

This is a study of two basic concepts of *Acharya Sushruta*. It was my humble attempt to collect all the relevant references from different *Samhitas* as well as other available ancient and modern books.

- (1) Study and collection of references related to concept of *avedhya sira*.
- (2) Study and collection of references related to *marma- sharira* from different *Samhitas*.
- (3) Study the correlation between *avedhya sira* and *sira – marma* in *greeva* (Neck).
- (4) Correlation of these terms with modern anatomical structures.

Classical review:-

Acharya Sushruta has described 700 *siras* which nourish the body like garden by water carriers and like field by irrigating channels¹. He has used the term *sira* to denote the vessels. But sometimes *sira* term is also used to denote artery, capillary, lymphatic and also nerve.

In *Sushruta Samhita Sharira – Sthana Adhyay – 7, Sira shariram* and “*Sira Vedhya-vidhi Shariram*” are described. As the term *sira* is used for different structures in different context it becomes controversial. But *Acharya Sushruta* has cleared this confusion in “*Dhamani Shariram Vyakarna*” (*Sushruta sharira sthana – 9th adhyay*).

According to *Acharya Sushruta sira* means the fiber like structures just like fine fiber in the leaf of a tree. They are thick at the roots and become fine at the end. The blood flowing is collected from different parts of the body is carried towards the heart. All the *siras* are further divided into 4 types depending upon color, originating point, function, etc.^{2,3}

- (i) *Vataavaha*
- (ii) *Pittavaha*
- (iii) *Kaphavaha*
- (iv) *Raktavaha*

Four types^{3,19}

1) *Vatavaha sira :-*

Color :- *Aruna varna* (crimson Red)

Content:- Filled with *vayu*. (Pulsation)

Function:- All the physical activities (*kriya*) of body are performed and they are responsible for functions of sense organs and related to *vatavaha nadi – samsthana*.

Modern Anatomical Correlation: - Artery and Nerves

2) *Pittavaha sira:*

Color: - *Neela varna* (blue)

Content: - carrying *pitta* so they are warm

Functions: - gives luster to the body, maintains good appetite.

Modern anatomical correlation: - veins

3) Kaphavaha sira:

Color: - *Goura varna* (white)

Content: - *Kapha* (cool touch) *sthir* (steady)

Modern anatomical correlation: - Lymphatic

Function:- Gives lubrication to the various body parts and gives firmness to the joints.

4) Raktavaha sira

Color: *Rohini varna* (Red)

Content/ character: - Neither cold nor too hot

Function: - Give nourishments to the *dhatu*s and improve complexion, perception of *sparsa* .

Modern anatomical correlation: - Capillaries

In short, the term *siras* means veins. *Acharya Sushruta* has described the structure of *sira* in “*Siravarna Vibhakta Marma Shariram*” also he has described the *Sira Vedhya Vidhi Shariram* means the concept of ‘*Vedhya Avedhya Sira*’ which is a very unique and important concept for every surgeon. Out of 700 *siras*, 98 *siras* are *avedhya*. Of these, *greevagat siras* are 16. Here *greeva* means front of the neck. In *Ash-tang Sangrah*, *Acharya Vagbhat* has described *Kanth* as “*Greeva puro bhaga*” which means the front of neck.

“*Greevaya purobhaga*”⁴

The 16 *avedhya siras* in the neck are

- 1) *Ashta – Matraka* - 8
- 2) *Krukatika* -2- 2 =4
- 3) *Vidhur* - 2 – 2 = 4

The specific positions of these *avedhya siras* are not described. But *greevagat sira marmas* are described in detail.

As per the dominance of the structure⁸ at the vital spot they are classified as (1) *mamsa marma* (2) *sira marma* (3) *snayu marma* (4) *Asthi marma* (5) *sandhi mrma*.

Marma

These are the anatomical sites where muscles, veins, ligaments, bones and joints meet together. This does not mean that all the structures must be present collectively at the site.

Greevagat – sira marma

Nila dhamani = 4 (2 each)

Matruka - = 8 (4-4on either side of *kanthanadi*)

As per *Acharya Sushruta*, *marma* is a vital spot where muscles, blood vessels, ligaments, bones and joints are assembled and where *prana* stays(life breath)^{5,10}.

Prana⁶

“*Jeevita aadhar* ”

Acharya Charak has described concept of *pranayatan* and also specified site or place of *Kantha* as *pranayatan*. He has described *dasha pranayatan*, injury to which will lead to death..*Kantha* is one of *dasha pranayatan* where *pran* lives, especially in case of *Kantha pranayatan*, the word indicates *pranvayu*. *Pran* means *jiva* or soul which occupies the whole body but special place of *pran* mentioned by *Acharya* are *pranayatan*. The word *kantha* means larynx, *kanthanadi* as trachea and *Kanthisira* as carotid arteries and jugular veins.^{7,15}

Types of marma⁸

Marmas are classified on the basis of different factors

As per location⁹ (or site) the marmas are classified as (1) *Shakhagat* – 44 (Arm & Legs/ Extremities) (2) *Udargat* (Abdomen) =3 (3) *Urah*

(chest)= 9 (4) *Prishthagat* (back)- 14 (5) *Shiro-greeva* (Head & neck) = 37

Also they are **classified as per their vulnerability**¹⁰ as

1. *Sadyapranhar* – which is *agni mahabhoot bahula* (fiery) in nature and injury to these group are immediately fatal.
2. *Kalantara pranahara* – these vital spots are both *agni & jala (mahabhoot bahula)* in nature. If injury occurs, death cause after passage of time.
3. *Vishalyaghna marma* – death occurs after the removal of foreign body, points to the dominance of the spot by *vayu* because the torn body had plugged the exit of the vital breath which occurs as soon as it is removed.
4. *Rujakar marma* – at these vital spots *agni* (fire) and *vayu* are dominant. Sever pain occurs after injury to these vital spots.
5. *Vaikalyakar marma* – disabilities and deformities occur when the vital spots are injured. These are *jala mahabhoot bahula* (watery).

The specific positions of these *avedhya siras* are not described. The *marmas* are described as *sira marma* in *greeva* are.

- 1) *Matruka* – 8
- 2) *Neela* – *manya* = 2+2=4

In case of trauma to these *sira marma*, results are same i.e. either death or deformity. On this basis and the position of *marmas* given in the text, we are trying to find out the anatomical structure related to these terms.

Matruka sira-

Acharya Sushruta has described *matruka marma* as *sira-marma* which lie in the neck on the either side of the *kanthanadi*. According to

the effect on injury to these *marm(parinamanusar)* these are *sadyapranhar marma*. As per anatomical structures, (according to *rachana*) these are *sira marma*.¹¹

Location of marma.

These are different *siras* present on either side of *kanthnadi* and cutting or injury to the same result into sudden death.

Measurement¹²:- According to *Acharya Sushruta, anguli Pramana* of *matruka marma* is 4 fingers.

In neck (*greeva*-front of neck), the major blood vessel are carotid arteries and jugular veins which lie four on each side, located in the carotid triangle as per *anguli pramana* (measurement). Injury to these *marma* leads to profuse bleeding resulting to death. Hear the *Avedhya sira* in neck are *ashta- matruka* which are 4 vessels on each side of *kanthanaadi* (1) Common carotid artery (2) External carotid artery (3) Internal carotid artery (4) Internal jugular vein. Also the term *sira* is used for both for veins as well as artery.^{13,14}

Neela manya¹⁵

In the Anterior aspect of neck region, there are 8+4 (in total) 12 *marma* and their size (*Pramana*) should be taken as *swa-hasta-tal*. This fixes the site of all the *Greevagat sira marma* . When there is injury on *neela*- it is followed by the paralysis of vocal cords leading to loss of voice .These effects are seen when there is injury to laryngeal nerve. Although the term *neela* indicates the blood vessels but when we study the actual effects of injury on the vessels are found to be the nerves which prove that *neela* should be considered as laryngeal nerve.

Similarly if there is injury on *manya marma*, the effect is *swaravikriti* which is again related to nervous system. Injury to the nerve

presiding the tongue i.e. Glassopharyngeal , Hypoglossal (superior thyroid) artery & lingual artery will result into loss of sensation and taste & tongue is paralysed .Also it is included in *vai-kalyakara* group.

This proves that *manya* should be considered as glassopharyngeal nerve, lingual nerve & accessory nerve.

Krukatika¹⁶

As per *Acharya Sushruta Krukatika* is *Avedhya Sira* which are 2 in number. According to Dr. B.G. Ghanekar they are correlated to occipital vessels. In terms of *Marma Sharir* ,*Krukatika* is a *Sandhi marma* (the joint of the neck)¹⁷.

Measure & Type - 2, *sandhi*, 1/2 *anguli*¹⁸

Site - At the junction of neck and head. Controls posture.

Anatomical Structures - atlanto-occipital joint. Occipital and 1st cervical bone. Anterior longitudinal, Anterior and posterior Primary ramus nerves. Vertebral artery and vein.¹⁹

Signs if injured -²⁰ Injuries to the joint will lead to limitation of the movement of the head and deformity. The dislocation of the joint could produce instant death also by pressing on the medulla oblongata. It is *vaikalyakara* type of *marma* but should also be included in *sadhya pranahara* type.

Vidhur²¹

While describing *Avedhya sira*, *Sushruta* has described *Vidhura* as *Avedhya sira*. According to Dr. B.G. Ghanekar, Its modern correlation is done with postero-auricular vessel. As per *marma sharir*, *Vidhur* a is *Snayu marma*.

Measure & Type s- 2, *Snayu*, 1/2 *anguli*

Site-²²

- Behind and below the ear.
- Just below the mastoid bone.
- Controls functions of sense organ of hearing.

Anatomical Structures²² - mastoid muscle. Facial nerve, Great Auricular nerve and Auditory nerve. Basilar and posterior auricular artery. Post auricular vein

CONCLUSION-

While describing the *Greevagat marma* *Acharya Sushruta* has clearly mentioned the names, location, type, size of *marmas* along with symptoms after injury to the particular *marma*. Concept of *Avedhya sira* is also described in detail but term *sira* is used for different structures.

1. *Vatvaha sira* filled with *vayu* is nothing but a artery as per color and character(pulsation). As per function, its anatomical correlation is also done with nerve
2. *Pittavaha sira* means the veins as per modern science.
3. *Kaphvaha sira* means lymphatic which carry clear fluid lymph as per anatomical structure.
4. *Raktavaha sira* are nothing but capillaries as per modern anatomical correlation.

On the detail study of both the concepts of *Avedhya sira* and *sira marma*, following conclusions can be drawn.

1. *Greevayaha purobhaga* (*shabdakalpadruma*) front of the neck.
2. *Ashatamatruka* means common carotid artery, internal carotid, external carotid artery and & internal jugular veins.

Nilanya - although the name *Nilanya* indicates blood vessels, the symptoms on injury indicates the laryngeal nerve producing paralysis of vocal

cords leading to loss of voice. It is *Vaikalyakara* type of *marma*.

Manya marma – injury to this *marma* results to loss of sensation and taste of the tongue and its paralysis also. It is *vaikalyakara* type of *marma*. The anatomical structure is Glassopharyngeal nerve, Lingual nerve and Accessory nerves.

Acharya Sushruta has not described *nila manya* as *Avedhya sira*s.

Krukatika- At the junction of neck and head. As per *marma* concept it is a *sandhi marma* and *vaikalyakara* type of *marma*. Injury to the joint leads to limitation of the movement of the head and deformity. The dislocation of the joint may result in instant death by pressing on the medulla oblongata. It is *Vaikalyakara* type of *marma* but should also be included in *sadyha pranahara* type.

Krukatika is included under the head *Avedhya sira* and according to Dr. B.G. Ghanekar they are occipital vessels.

Vidhur

As per the site *vidhur marma* lies behind and below the ear just below the mastoid bone which is related with the functions of sense organ of hearing. Injury to this will cause deafness and it is *vaikalyakara* type of *marma*. *Acharya Sushruta* has described it as *Avedhya sira* & according to Dr. B.G. Ghanekar they are correlated with posterior auricular vessels but as per the injury results they can be correlated with auditory nerve and great auricular nerve and facial nerve, post auricular vein. But this *marma* is not *Greevagat marma*.

From the above brief study of both the concepts we can conclude that anatomical structures and site cannot be compared completely. Only *Matruka marma* and *Matruka avedhya sira* can be correlated.

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