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 numbers\(^1\). 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 greevata 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 channels. 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 Vedhyavidhi 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 “Dhamanipriya 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. 

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

Four types

1) Vataavaha siras:
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 siras:
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 dhatus and improve complexion, perception of sparsha.
Modern anatomical correlation: - Capillaries

In short, the term sira 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 Ashhtang Sangrah, Acharya Vagbhat has described Kantha as “Greeva puro bhaga” which means the front of neck.

“Greevaya purobhaga”

The 16 avedhya siras in the neck are
1) Ashta – Matruka - 8
2) Krukatiaka -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.

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 (4-4 on 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.

Prana
“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 pranayu. 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 Kathasira as carotid arteries and jugular veins.7,15

Types of marma
Marmas are classified on the basis of different factors

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

As per location (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
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. Vishalyaghn 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 sira 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 sire-
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.

Location of marma.

These are different sira present on either side of kanthnadi and cutting or injury to the same result into sudden death.
Measurement 12:- 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 sire 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.

Nila manya

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 vaikalyakara group.

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

Krukatika

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).

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

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


Signs if injured - 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.

Vidhur

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

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

Site - Behind and below the ear.

Just below the mastoid bone.

Controls functions of sense organ of hearing.


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.

Nila manya - although the name Nila indicates blood vessels, the symptoms on injury indicates the laryngeal nerve producing paralysis of vocal function.
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 siras.

**Krutatika**- 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 pranaha-ra type.

Krutatika 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 Matraka marma and Matraka avedhya sira can be correlated.

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