Enlightening the Concept of Snayu in Ayurveda

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ABSTRACT

Ayurveda is a contemporary science which needs a lot of research to set up its legitimacy along with modern medical science and in this session first thing is to define the terms mentioned in Ayurvedic classics. Rachana Sharir is the subject which deals with a basics of any medical science that is sharir, its related terms and defining these anatomical terms are at utmost for application of the science. Snayu is one such term which is well described in classical texts still it is required to know exact structure related to it in human body. In this study, the matter related to the Snayu are collected and attempted to explain in the structure form. Literal meaning of word Snayu is “to bind”. It is mentioned as a structure which aids in binding the joints, also in weight bearing of the body while structurally it has been mentioned something similar to a fibrous in nature.

Acharya Sushruta mentioned about the formation of Snayu in Garbha which invincibly support the concept of formation ofligaments/ tendons/aponeurosis according to theory of modern medical sciences. Acharya has only briefed about the number and types of Snayu. Whereas there is no further detailed explanation about position, articulation, applied anatomy and clinical significance of Snayu given by him, while the role of Snayu in stabilizing the joints and other chief functions as per idea of modern medical sciences is very important, has high concern with the anatomy of ligament/tendon/aponeurosis because of their structural and functional resemblance with Snayu.

In Ayurveda, Snayugata Vata is explained under the concept of Vatavyadhi. The Vata Dosh vitiation occurs which settles down in the Snayu of the Sharira. In Snayugata Vata, there is the Shoola, Kampa, Stambha andid in Kurpara Sandhi according to the Lakshanas, we can correlate it to tennis elbow in Modern science.

KEYWORDS: Snayu, fibrous structure, ligaments

INTRODUCTION

Sharira Rachana is one of the basic subjects for the fundamentals of Ayurveda. Before treatment one must be aware of constituent structures of human body and this particular branch that is Sharir Rachana deals with the structures of a human body, its applied aspects & clinical importance. Most of these structural units are explained in our Samhita but very difficult to understand. It will be very beneficial to explicate all the anatomical terms with reference to the Samhita for better understanding. Snayu Sharira is one such area which requires much more research. Referring to studies till date, Snayu is explained in following manner: Acharya Sushruta being one of the pioneer scholars of Ayurveda has described various anatomical structures, their position and function in body in Sharir Sthanam. He has narrated formation of Snayuin the 4th chapter of Sharir Sthanam and in the fifth chapter, he told the clinico-anatomical importance of Snayu. Clinical importance of Snayu can be seen in Charaka Samhita also. The contribution of Snayu as structural constituent and as a vital part of the body is well described in Sushruta Samhita and its various other Ayurveda literature.

Etymology of Snayu

Word Snayu came from the root word (Dhatu) ‘Sna. Snayu is said to be an entity that binds the Anga-Pratyanga Sandhi. According to Amarkosh Maha Snayu is called a Kandara’. 
**HISTORICAL REVIEW**

In *Dhamarveda* the term *Snayu* is cited in the context of describing the features of a bow string. *Snayu* was used as a bow string because of its strength. Another reference of *Snayu* have been mentioned in the *Agnipurana* as a structural element of body which is present below the skin and which covered blood, bones and muscular part. This statement is in the context of method of doing *Abhyanga* for a king.

**AYURVEDA REVIEW**

**Definition of Snayu**

Structural description of *Snayu* given by *AacharyaDalhana* very clearly that *Snayu* is *Shamakaar.* *AcharyaSharmadharatold Snayu* as a structure which support the body through binding *Mamsa, Asthi and Medas*. According to *Chakrapanithe* *Snayu, Sira* etc. are binding structure of the body. These are prepared by essence part of food *Snayu* binds the *Mamsa, Asthi and Medapowerfully and as these are stronger than *Sira*, can bind the joints also very strongly.

**Upatti of Snayu**

The *Siras* derives *Sneha* part from the *Meda* after which they get converted into the *Snayu*. The *Paaka* of the *Siras* is *Mrudau* while that of *Snayu* is *Kharaa* and this is the difference between *Siras* and *Snayu*.

The essence of *Meda* is the *Asthi, Snayu and Sandhi* and its waste is *Sveda*.

**SnayuSankhya**

In *Sushruta Samhita* *Snayu* are nine hundred in numbers:

<table>
<thead>
<tr>
<th>Total number of Snayu =900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shalha (Extremities) 600= (150 x 4)</td>
</tr>
<tr>
<td>Anguli (30)</td>
</tr>
<tr>
<td>PadaTala, PadaKarcha and Gulpha (30)</td>
</tr>
<tr>
<td>Jana (10)</td>
</tr>
<tr>
<td>Jangha (30)</td>
</tr>
<tr>
<td>Uru (40)</td>
</tr>
<tr>
<td>Vankshana (10)</td>
</tr>
<tr>
<td>Madhya Sharira (trunk) 230</td>
</tr>
<tr>
<td>Kati(60)</td>
</tr>
<tr>
<td>Pruthat(80)</td>
</tr>
<tr>
<td>Prashvat(60)</td>
</tr>
<tr>
<td>Uras (30)</td>
</tr>
<tr>
<td>Shirogrevra (head &amp; Neck) 70</td>
</tr>
<tr>
<td>Grivat(36)</td>
</tr>
<tr>
<td>Murdha(34)</td>
</tr>
</tbody>
</table>

**SnayuBheda (Types of Snayu)**

*Snayu* are of four kinds.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Type</th>
<th>location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>Pratanvati</em> (tendril like)</td>
<td><em>Shukha</em> (extremities) and <em>Sarva Sandhi</em> (all bony joints).</td>
</tr>
<tr>
<td>2.</td>
<td><em>Vrutt</em> (round/tring like)</td>
<td><em>Kandara</em></td>
</tr>
<tr>
<td>4.</td>
<td><em>Sushira</em> (having lumen)</td>
<td>terminal part of <em>Amashaya</em> (stomach), <em>Pakvashaya</em> (large intestine) and <em>Basti</em> (urinary bladder).</td>
</tr>
</tbody>
</table>

**Snayu Prayojana (Function of Snayu)**

Just like a properly built boat with wooden planks, tightened by ropes is capable of carrying weight of passengers, similarly the human body is able to carry its weight, as the all*Sandhis* (bony joints) are tightly bounded by many *Snayu*. Neither *Asthi, Peshi* (muscles), *Sira* nor *Santhimakes* person indolent when injured and injury to these is not as severe to *Snayu*. *Snayueffects* body badly when injured or diseased. All the parts of the human body are compactly held together by *Snayu*. The *Mamsa, Asthi* and *Meda* of the human body are binded together by the *Snayu*.

**Snayu in reference of Kala**

According to *AcharyaSushrutaKala* can be seen as *SnayuPraticchanathat is Kala* is covered by *Snayu*.

*Kalas* are seven, out of which the first is *Mamsadhara*, it contains the branches of *Sira, Snayu, Dhamni* and *Srotas*. These are present just as the roots and shoots of lotus spread over ground full of mud.
Snayu in concept of Basti

Basti is situated in between umbilicus, back, planks, rectum, groins and penis, having one orifice and thin skin, placed with its faced downwards, Alabu shaped Bastis are supported by Sira and Snayu.

Concept of Snayuarma

The muscles on the sclera increases in thickness becoming rough and white in colour is called as Snayuarma.

Snayu as MastulungaMoola

Snayu is Moolasthana of Mastulunga according to KashyapaSamhita. Mastulunga has been explained as a type of Medas in SushrutaSamhita.

Clinical aspect of Sanayu- Snayu Gatavata

Vayus Tisatra Vanta Dharah which means Vata in its normal state bears all the organs of the body and its functions. If Vata get vitiated, can lead to the manifestation of certain diseases. The Prakupita Vata moves and gets confined in the specific Sthanas causing disturbance in the normal functioning of that Sthanas. This thought can be correlated to Snayu Gatavata in which due to various Nidana Sevana Prakupita Vayu gets situated in Snayu. The Lakshanas of Snayu Gatavata are described by various Acharyas. Vayyama, Antarayama, Khali, Khabaja, Sarvanga Vata, Ekangavata, Sambhata, Kampa, Shoolata.

DISCUSSION

While etymological review, we get a few instances that Snayu is a structure which binds the Anga-Pratyanga Sandhitatogether. The definition also shows that the Snayu are strong cord like structure made up of fine fibres, helps in binding the body parts together which shows that this structure is supposed to be a very strong, so that it can hold the bones and muscles together and helps to transfer weight. It is supposed to be present around the joints as bones are held together near them. Hence can be understood as a tendon, ligament attached to bone at either end. Acharya Sushruta has also suggested some material to be used in suturing the raised margins of the Vrana. The Snayu fibres are also involved in this list; therefore, it underlines that Snayu are the fibre like material. Snayus also mentioned as a structure which covers body structures. Fascia is also fibrous in nature and covers the muscles, hence can be included under Snayu. In this context we can also say that entity Snayu indicates the deep fascia because of its binding nature and location as deep fascia located below the skin and covers the bone, muscle and vessels. According to commentary by Dalhana, it is stated that Snayu is seen to be binding Sharira Auyavaya. From the review of contemporary science discloses that Mamsa (muscles) bind to the bones through tendons, the bones bind together at each joint by ligaments. In the breast the fatty tissue is held in place by ligaments called as suspensory ligaments.

Over-all, the function of fibrous structures in a human body is to bind the body structures intact so as to provide the ability to move and bear its own weight as well as extra weight too. The body is able to stand erect or sit or even lift themselves up against the gravity due to proper attachment of muscle and bone. This attachment is given by ligaments and tendons. Structure wise Ligaments and tendons quite similar but differ in the way they are attached.

In the MethravanIrnipishadit is explained that the body is basically formed by bones cemented strongly by Snayu which is covered by Mamsa and Shomita and finally covered by skin. In this framework we can say that term Snayu indicate the ligament because ligaments are connected bone to bone. Ligaments connect bone to bone and tendons connect muscles to bone. According to this reference Snayu may be correlated with ligament.

Bharthahrarin Neetishataka in one context mentioned that even though it does not satisfy his hunger, a dog is happy to get a bone which is covered with Snayu and little Vasa and has no Mamsa on it. From this we can thought Snayusas a structure which is very closely related to bone and even if there is no Mamsa on an Asthi, Snayu can be still found on it. Ligaments connect bone to bone and tendons connect muscles to bone. Hence there is no muscular attachment on the bone so Snayu can be correlated structurally to ligament.

In the topic of Basti Sushruta discloses that, it is situated inside the cavity of the pelvis and supported by Sira and Snayu. Hence, it can be claimed that Snayu is a supportive and covering structure and can be directly correlated to ligament, because urinary bladder is situated in the pelvic cavity and supported by pelvic ligament.

Acharya Sushruta pictured Kala as a separating or differentiating unit between the Dhatu and Aashyain the body. It is formed by three components Snayu Pratichanna, Jarayu Santatand ShleshmaVeshthita, Kala is said to be protected by Snayu Pratichanna, or covered by Jarayu Santat and without ShleshmaVeshthita the thin film of serous spread over them. In the end we can deduce that Snayu Pratichanna, Jarayu Santatand ShleshmaVeshthita can be correlated with fibrous, serous and mucous membrane respectively.

In the topic of Mamsadhara Kala, it is structure which covers the muscle and deliver space for the route of Sira, Snayu and Dhammi. So, Mamsadhara Kala can be correlated to deep fascia which pierced by vein, artery and nerve. Therefore, we can denote Snayu as nerve.

Again, in the reference of Arma, a type of Arma is named as Snayuarma because it resembles Snayu in appearance and Snayuarma is a white, tough structure.

Snayu is Moolasthana of Mastulunga according to KashyapaSamhita. Acharya Dalhunadescribed Mastulungasa Mastaka Majja which is in the state of partially melted ghee. Mastulunga is also referred as Majja which is a type of Medas. According to Acharya Sharmphara, Snayu aids in binding Medas too. Study of the related structures was done which suggest the layers of brain. Between the 3 layers of brain, dura mater is a fibrous structure and is
toughest among the meninges. It plays an important role as a protective covering as well as a binding structure. This being fibrous membrane of brain and having the function of binding, duramater can be considered as Snayu which is referred to as Mastulunga Moola.

In SushrutaSamhita the Snayus are of four types-
1. PratanvatiSnayu
2. VruttaSnayu
3. SushiraSnayu
4. PrathuSnayu

PratanvatiSnayu–

Pratanvati means a tendril or a shoot or a spreading creeper. These are said to be present in Shakhaand all Sandhi. So Pratanvavantype of Snayu supposed be present in all joints of body and extremities also they should be having branching pattern and like a creeper. So, the structures which resembles PratanvatiSnayu are:

- Ligaments- As these are present in all joints.
- Nerves- As these are like creepers and having branching pattern.

VruttaSnayu–

Vrutta means round or ring like. AcharyaSushruta also stated Vrutta Snayu as Kandara. Kandara is called MahaSnayu. It is a cord like structure which is similar to Snayu but large in size. So Kandara should be large circular or cord like structure. In perspective to modern science human the structures resembling Kandara or VruttaSnayu are:

- Tendons- As these are cord like
- Large Nerves cords- These are also cord like and resemble tendon.

Prathu Snayu -:

The literal meaning of wordPrathulais a broad or large. So, these structures should be Large, broad and flat. The PrathuSnayu is found to be present in Parshva, Uras, Prattha and Shir. According to Dr. Ghanekar the PrathuSnayu are flattened or ribbon shaped tendons or aponeurosis. Acharya Damodar Sharma Gaur has also told Prathu Snayu as flattened or expanded fibrous sheets like lumbodorsal fascia, Galea aponeurotica and other aponeurosis. The term aponeurosis is now more often used for any broad sheet of the connective tissue related to the attachment of muscle. Sometimes this whole attachment is aponeurotic. The biggest example of such aponeurosis is galea aponeurotica or epicranial aponeurosis covering the upper part of the cranium showing its presence in shiras mentioned by Acharya. Thoraco-lumbar fascia can be seen as an example of PrathuSnayu. It is situated in the Pritha Bhaga and covers the deep muscle of the back of the trunk. The thoraco-lumbar fascia in the thoracic region (uras) is a thin fibrous lamina that covers the extensor muscle of the vertebral column. Thoraco-lumbar fascia does its job by connecting the spines of thoracic vertebra to the angles of the ribs and holds them in position similarly in the lumbar region. Another example of aponeurosis is inguinal ligament which connects two bony parts and forms the lower boundary of the abdomen. This shows the presence of PrathuSnayus mentioned by AcharyaSushrutaParshva, Uras, Pritha, Shireregions in the form of fascia or aponeuroses either entirely or as a part of the muscle.

Sushira Snayu–

Sushira means porous, hollow, cavity etc. Acharya Susrutadescribed Sushira Snayu is present in the terminal part of regions like Amashaya, Pakavashaya, Basti etc. So, these are structures which are porous like in nature and also present in the openings of hollow organs or organs with lumen and hold these hollow organs (viscera). The structures which show similarity to Sushira Snayus are sphincters and visceral ligament.

If the Snayu of one joint is affected, then it is known as Ekanga Vata; if the multiple joints are involved then it is known as Sarvanga Vata. TheLakshanas of Snayu as unfolded by Acharya Sushruta are Shoola, Stambha and Kampa which can be correlated with the signs and symptoms of Tennis Elbow if happening Kurpara Sandhiand other diseases according to place. Additionally, Snayus are present in close relation to Sandhist(bony joint) troubled Vyana Vaya can interrupt the normal functions of Snayus also. Involvement of Marma, Vata Dosha and Dhatvarishavamake disease more Kashtha Sadhya. Therefore, it is clear that lateral epicondylitis is a degenerative disorder that compromises the extensor tendons originating from the lateral epicondyle.

CONCLUSION

Snayu is an entity which accomplishes the function of holding and binding the various structures of human like bones, muscles and adipose tissue. Snayu being used as bow string shows its strength. Detailed study of this discloses them as usually fibrous structures which are strong enough to endure a certain amount of tension. ligament, tendons, aponeurosis, retinaculum, nerve, deep fascia and other fibrous structures in the body fits into the above description.

The meaning of Snayu is different in different backgrounds such as ligament in binding bone and joints also in other references, tendon in binding the muscle to bone, dura matter and aponeurosis in binding the Meda, nerve and fibrous in context to Kala.
Snayu are of four kinds; we can consider below mentioned entity. 

Pratatanavat Snayu – Ligaments of the limbs and nerve

Vrata Snayu - Tendons and large nerve cord

PruthuSnayu - Aponeurosis and Fascia

SushiraSnayu - Sphincters and ligament of viscera

Snayugata Vata is the illness of Snayu and Vata. Ativyayama, Atichaṣṭa (Excessive physical exercises/movements) and Abhighata(Karpura Marma Abhighata) are the major contributory Nidanawhich leads to the vitiation of Sihanika Vata. In case of Tennis elbow is due to the mechanical overload occurring during sports with improper techniques and heavy machine work also repetitive activity and over use are the most common factor for the trauma to the tendon. This condition is stated as degenerative tendinitis. The precise Ayurvedic treatment methods may help to in the healing and regeneration of tissues. So, the knowledge of such structures like Snayu in Ayurveda and others diseases of Snayu helps in the wellbeing of mankind.

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