

A Conceptual study of *Snayu Sharir*

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Abstract- *Ayurveda* is a science which requires a lot of research to establish its authenticity along with modern medical science. The first step in this is to define the terms mentioned in *Ayurvedic* classics, especially the basic terms. The science cannot be implemented methodically as long as the terms are not properly understood. *Sharira Rachana* is the subject which deals with a lot of anatomical terms and defining these terms are important for application of the science. *Snayu* is a term which is explained elaborately in classical texts but yet it is unable to point out exact structure related with it in human body. During this study, the references related to the *Snayu* are collected and tried to explain as a structure form. Literally the term *Snayu* means to bind. It is explained as a structure which helps in binding the joints and helps the body in weight bearing. Structurally it has been described something similar to a fibrous in nature.

Key words: - *Snayu*, fibrous structure, *Sharir Rachana*,

Introduction

Sharira Rachana is one of the basic subjects for the principles of *Ayurveda*. It deals with the structure of a human body, its applied aspects & clinical importance. Most of the structural entities explained in our *Samhita* are very difficult to understand. It is very important to interpret the anatomical terms with reference to the *Samhita*. There is a lacuna in this interpretation. *Snayu Sharira* is one of such area which needs much more research. In the present study *Snayu* is explain in following manner.

Vyutpatti

The word *Snayu* is formed from the word root (*Dhatu*) 'Sna'. 'Sna' *Dhatu* when combined with 'un' and 'yuk' *Pratyaya* forms the word *Snayu*.¹

Nirukti

Vachaspatya states *Snayu* as a *Strilinga Shabda*. The etymology is similar to *Sidhanta Kaumudi*. Its function is binding the body. Details regarding *Swaroop*, function and *Sankhya* have been adopted from *Bhavprakash*.²

Etymology of *Snayu* is similar to other texts as per in *Shabdakalpadrum*. Here also *Snayu* is mentioned as a *Srtilinga Shabda*.

Synonyms of *Snayu*

Snayu is said to be a structure which binds the *Anga-Pratyanga Sandhi*. According to *Amarkosh* *MahaSnayu* is called a *Kandara*.³

Historical Review

In *Dhanurveda* the term *Snayu* is mentioned in the context of describing the characteristics of a bow string. *Snayu* is used as bow string owing to its strength. It has been recommended to use the *Snayu* of deer, she-buffalo or cow. The bow string can also be prepared from other materials or *Sthavara Dravyas* in the absence of absolute *Snayu* the references for substitute also gives an insight on the structure of actual *Sanyu*. It has been suggested here that at the advent of *Bhadrapada* month the bark of *Arka* tree becomes commendable to prepare bow string.

This explained that the body is basically formed by bones, bind strongly by *Snayu* which is covered by *Mamsa* and *Shonita* and finally covered by skin.

Another reference of *Snayu* as a structural part of body it is seen below the skin and covered by blood, bones and muscular part. This reference is in the context of method of doing *Abhyanga* for a king.

It has been stated in this book that this body is made on the base of *Asthi* which is bond by *Snayu*. *Mamsa* and *Shonita* cover the *Asthi* as well as *Snayu* and finally it is covered by skin.

Bharthari in *Neethishatak* at one context explains 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

understand that *Snayu* is considered to be a structure which is very closely related to bone that even if there is no *Mamsa* on an *Asthi*, *Snayu* can be still found on it.

Kalhana in *Rajtarngini* has mentioned in the context of explaining an injured state in which *Devi's* hands are devoid of *Mamsa*, only *Asthi* and *Snayu*.⁴

Ayurveda Review

Definition of Snayu

A very clear structural description about by *Aacharya Dalhana* that *Snayu* is *Shanakaar*.⁵

Acharya Sharngadhara mentioned *Snayu* as a structure which support the body by binding *Mamsa*, *Asthi* and *Medas*.⁶

According to *Chakrapani Snayu*, *Sira* etc. are binding structure in the body. These are formed by essence part of food.

Snayu binds the *Mamsa*, *Asthi* and *Meda* potently and as these are stronger than *Sira*, can bind the joints also very strongly.⁷

Utpatti of Snayu

From the unctuous portion of *Medas* both *Sira* and *Snayu* are formed, *Sira* arise from *Mrudu Paaka* and *Snayu* from *Khara Paaka*.⁸

The essence of *Meda* is the *Asthi*, *Snayu* and *Sandhi*; and its waste is *Sveda*.⁹

Snayu as Mastulunga Moola

Snayu is *Moolasthan* of *Mastulunga* according to *Kashyapa Samhita*.¹⁰ *Mastulunga* has been explained as a type of *Medas* in *Sushruta Samhita*.¹¹

Snayu Sankhya

According to *Sushruta Snayu* are nine hundred in numbers; of these six hundred are in *Shakha*, two hundred and thirty in the *Kosht* and seventy in *Griva* and above.

Of these, six are present in each of the fingers of the foot, so thirty in total; the same number in *Pada Tala*, the same in *Pada Kurca* and *Gulpha*; the same number in *Jangha*; ten in *Janu*, forty in *Uru*, ten in *Vankshana* – thus these are one hundred and fifty in one leg; in this way other leg and the two are arms described.

Sixty are present in *Kati*, eighty in *Prustha*, sixty in the two *Parshva*, thirty in *Ura*, thirty six in *Griva*, thirty four in *Murdha*-in this manner nine hundred *Snayu* are described.¹²

Snayu Bheda (Types of Snayu)

Snayu are of four kinds i.e. *Pratanvati*, *Vrutta*, *Pruthu* and *Sushira*.

Pratanvati (spread out / broad) are present in *Shakha* (extremities) and *Sarva Sandhi* (all bony joints).

Vrutta (round/ cylindrical) are known as *Kandara* by the experts.

Pruthu (thick big) are present in *Parshva* (flanks), *Uras* (chest) *Prustha* (back) and *Shir* (head).

Sushira (hollow, ring like) are present at the terminal part of *Amashaya* (stomach), *Pakvashaya* (large intestine) and *Basti* (urinary bladder).¹³

Snayu Prayojana (Function of Snayu)

Just as a boat built with wooden planks placed side by side, when fastened tightly by ropes in many ways becomes capable of carrying weight in water, steered by a man, similarly the human body will be able to carry weight, so long as the joints are fastened tightly by *Snayu* in many ways. Neither *Asthi*, *Peshi* (muscles), *Sira* nor *Sandhi* kills the person when injured just as *Snayu*.¹⁴

Concept of Kalaa

Kala becomes visible; these are differentiated as *Snayu Praticchana* (covered/formed from ligaments), *Jarayu Santata* (expansion of continuation of foetal covering) and *Sleshmveshtith* (coated with *kapha*).¹⁵

The moisture that remains inside the space in the *Dhatu* gets (*Paka*) processed by the *Ushma* present in them, forms into structure similar to those found in tree and becomes covered with *Snayu*, *Sleshma* and *Jarayu*. It is called as *Kalaa*.¹⁶

The first *Kala* is *Mamsadhara Kala*, which is present inside the muscles, and which allows the *Sira*, *Snayu* and *Dhamani* to spread their branches inside the muscles.¹⁷

Among them, the first one is by name *Mamsadhara*, within which are spread the *Sira*, *Snayu*, *Dhamni* and *Srotas* just as the roots, shoots and creepers of lotus plant are spread in the ground full of slit.

Concept of Basti

Basti is situated in the midst of the umbilicus, back, waist, scrotum, rectum, groins and penis: has one orifice and thin skin, placed with its faced downwards: *Basti*, *Bastisiras Paurusha*, *Vrushana* and *Guda* are inter related and situated inside the cavity of the pelvis, pelvic bone: it is shaped like *Alabu* and supported by *Sira* and *Snayu*.¹⁸

Concept of Snayuarma

The muscles present on the sclera increasing in thickness, rough and very white in colour is called as *Snayuarma*.¹⁹

Discussion

During the etymological review, we came across a few instances that *Snayu* is a structure which binds the *Anga-Pratyanga Sandhi*. Synonyms of *Snayu* are said to be *Snasa*, *Vatsana*, *Sira*, *Nadi* and *Dhamani*. In *Amarakosha*, it is mentioned that *Snayu* holds the *Asthi*(joints) together in *Anga* and *Pratyanga*. It also mentioned *Snayu* as a structure which covers body structures.

According to SANSKRIT ENGLISH- DICTIONARY (Sir Monier Williams) it is found that -

स्नायु- (A cord to some to fr. A/sha contracted from sina, pres base of /si 'to bind 'cf. also /snai any sinew or ligament in the human and animal body. Tendon, muscle, nerve, vein.

Etymologically *Snayu* is considered as a structure which performs the function of holding and binding the various structures of human body like bones, muscles and adipose tissue.

Acharya Sushruta mentioned that *Snayu* is *Shanakara*. *Snayu* is used for tying bow and as a *Seevan Dravya*. Again in the context of *Arma*, a type of *Arma* is named as *Snayuarma* because it resembles *Snayu* in appearance.

In *Dhanurveda* the term *Snayu* is mentioned in the context of describing the characteristics of a bow string. *Snayu* is used as bow string owing to its strength. Detailed observation of these structures reveals them as generally fibrous structures which are strong enough to withstand a certain amount of tension. Observations of *Snayuarma* show it as a white, tough structure. An overall observation of these structures gives an impression that *Snayu* is a fibrous structure visible in the body.

Aponeurosis, ligament, tendons, retinaculum, nerve, deep fascia and other fibrous structure in the body fits into the above description.

In the classics, the function of *Snayu* is to bind *Mamsa*, *Asthi* and *Medas* thereby helping in weight bearing. According to commentary by *Dalhan*, it is said that *Snayu* is seen to be binding *Sharira Avayava*. A review of the contemporary science reveals that *Mamsa* are binded to the bones by ligaments and tendons, the bones are binded together at each joint by ligaments. In the breast the fatty structure are held in place by ligaments called as suspensory ligaments. This substantiates that *Medas* is also held or binded by ligaments.

In general, the function of fibrous structures in a human body is to bind the body structures intact so as to have the ability to move bearing its own weight as well as bearing extra weight. The body is able to stand erect or sit or even lift him up against the gravity due to proper attachment of muscle and bone intact.

It should be a very strong structure, so that it holds the bones and muscles together and helps in the transfer of weight. It has to be present around the joints as bones are held together here. So the term *Snayu* literally means to bind. It is also explained as a tendon, ligament attached to bone at either end. It's also mentioned as a cord, sinew, ligament in the human or animal body.

Ligaments and tendons are similar in structure but differ in the way they are attached. Fascia is also fibrous in nature and covers the muscles, hence can be included under *Snayu*.

In the *Methrayani Upnishad* explained that the body is basically formed by bones binded strongly by *Snayu* which is covered by *Mamsa* and *Shonita* and finally covered by skin. In this context we can say that *Snayu* term indicate the ligament because ligaments are connected bone to bone.

In the *Agnipurana* another reference of *Snayu* have been found as a structural part of body which seen below the skin and it covered blood, bones and muscular part. This reference is in the context of method of doing *Abhyanga* for a king.²⁰ In this context we can say that *Snayu* term indicate the deep fascia its binding nature and location. Because deep fascia situated below the skin and covered the bone, muscle and vessels. Ligaments connect bone to bone and tendons connect muscles to bone. According to this reference *Snayu* may be correlated with ligament because ligament and tendon are deeply situated structure below the deep fascia (part of skin) and covered by muscle, vessels and nerve.

Bharthuhari in *Neetishataka* at one context explains 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 understand that *Snayu* is considered to be a structure which is very closely related to bone that 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 bony *Sanyu* it can correlates to structurally ligament.

Kalhana in *Rajtarngini* has mentioned in the context of explaining an injured state in which *Devi's* hands are devoid of *Mamsa*, only *Asthi* and *Snayu*. In the end we can say that *Snayu* is structurally similar to ligament and attached with the bone.

Acharya Dalhana defines *Mastulunga* as *Mastaka Majja* which is in the form of partially melted ghee. An observation of the related structures was done which include the layers of brain. Among the 3 layers of brain, duramater is a fibrous structure which is the toughest among the meninges. Duramater plays an important role as a protective covering as well as a binding structure. According to *Acharya Sharngdhara*, *Snayu* helps in binding *Medas* too which is discussed early. *Mastulunga* is also referred as *Majja* which is a type of *Medas*. As the fibrous limiting membrane of brain and having the function of binding, duramater can be considered as *Snayu* which is referred to as *Mastulunga Moola*.

Snayu are of four kinds; we will describe all these, here; *Pratanvati*, *Vrutta*, *Pruthu* and *Sushira*.

PratanavatiSnayu -:

Pratanvati means a tendril, a shoot, a low spreading plant, a spreading creeper and branching out. These are said to be present in *Shakha* and all *Sandhi*. So *Pratanavati* type of *Snayu* should be present in all joints of body and extremities and they should be having branching pattern and like a creeper. So the structures which resemble *PratanavatiSnayu* are

Ligaments- As these are present in all joints.

Nerves- As these are like creepers and have branching pattern.

VruttaSnayu-:

Vrutta means round or circular. These are cord like structures present in the body. *Acharya Susruta* also calls *VruttaSnayu* as *Kandara*. *Kandara* is called *MahaSnayu* or *Mahanadi*. 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 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.

PruthulaSnayu -:

The word meaning of *Pruthula* is a broad, large or great. So these should be structures which are Large, broad and flat resemble *PruthulaSnayu* in our body are

Aponeurosis

Fascia

Sushira Snayu-:

Sushira means porous, hollow, cavity etc. *Acharya Susruta* explains that *Sushira Snayu* is present in the terminal part of regions like *Amashaya*, *Pakvashaya*, *Basti* etc. So these are structures which are porous like in nature and also present in the openings of hollow organs and hold these hollow organs (viscera). So the structures which resemble *Sushira Snayu* are sphincters and visceral ligament.

In the context of *Snayu Prayojan* (function of *Snayu*) *Sushruta* mentioned that *Snayu* is like ropes in our body. Like the rope holds the wooden planks together, *Snayu* holds the body together making it capable of weight bearing. So long as the joints are fastened tightly by *Snayu* in many ways. In the end it can be correlated the ligament because ligament also firmly attached to the joints, fixed and support the joint and make a joint weight bearing part of body.

In the context of *Basti Sushruta* mentioned that, it is situated inside the cavity of the pelvis, pelvic bone: it is shaped like *Alabu* and supported by *Sira* and *Snayu*.³¹ In the end we can say 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.

In the context of *Kalaa Acharya Sushruta* has been mentioned that *Kalaa* is separating or differentiating entity between the *Dhatu* and *Aashya* in the body. *Aashaya* means *Avasthan Pradesh*, by this we can understand lining between *Rasa* (plasma), *Rakta* (blood) etc. tissue and their *Aashaya* (blood vessel) is called *Kalaa*.

These are not mere the limiting membranes but also perform some vital functions of the body. The word *Kalaa* stands for property or a quality so these are some special membranes in the body which are having important role in performing body physiology. It is formed by three types of component such as *Snayu Pratichanna*, *Jarayu Santat* and *Shleshma Veshtita*. According to *Ghanekar Acharya* all these three structures may or may not be necessarily be present in each and every *kalaa*, even one or two of the above mentioned structures may be found existing in the *kalaa*. So *Kalaa* are considered to be protected by *Snayu Pratichanna*, or covered by *Jarayu Santat* with or without *Shleshma Veshtita* (a thin film of serous spread over them). In the end we can say that *Snayu Pratichanna*, *Jarayu Santat* and *Shleshma Veshtita* can be correlated with fibrous, serous and mucous membrane respectively.

In the context of *Mamsadhara Kalaa* we can say that it is structural entity which is covering the muscle and provide space for passing *Sira*, *Snayu* and *Dhamni*. In the end we can say that *Mamsadhara Kala* can be correlates to deep fascia and it is pierced by vein, artery and nerve. In the end we can say that *Snayu* can be correlated to nerve

In the context of *Moolasthan* Acharya described *Snayu* and *Tvacha* are *Moolasthan* of *Mamsavaha Srotas*. In the external environment *Moola* words denote the root of tree due to their function of *Dharana* and *Poshana* such as similar reference regarding the *Sroto Moola* is also found due to their sustaining and nourishing functions. Injury on *Moola Sthan*, effect on it's depending entity. *Mamsa Dhatu* present muscles form in the body. Every movement of the body depend on the muscle and *Snayu* is also involved in the locomotor activity. Inserting or ending part of muscle is known as a tendon and it is attached to the bones, holds the muscle (sustain) and covered by skin. Any injury to these structures will effect on muscle function. So in the end we can say that *Snayu* is structurally similar to tendon in the context of *Moolasthan* of *Mamsavaha Srotas*.

Conclusion

Snayu is a structure which performs the function of holding and binding the various structures of human body like bones, muscles and adipose tissue.

Snayu is used as bow string owing to its strength. Detailed observation of these structures reveals them as generally fibrous structures which are strong enough to withstand a certain amount of tension. Observations of *Snayuarma* show it as a white, tough structure.

An overall observation of these structures gives an impression that *Snayu* is a fibrous structure visible in the body. Aponeurosis, ligament, tendons, retinaculum, nerve, deep fascia and other fibrous structures in the body fits into the above description.

The meaning of *Snayu* is different in different contexts such as ligament in binding bone and joints; tendon in binding the muscle and dura matter and aponeurosis in binding the *Meda*.

Snayu are of four kinds; we can consider below mentioned entity.

Pratanavati Snayu – Ligaments of the limbs and nerve

Vrutta Snayu -Tendons and large nerve cord

PruthulaSnayu - Aponeurosis and Fascia

SushiraSnayu - Sphincters and ligament of viscera

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