



Enlightening the Concept of *Snayu* in Ayurveda

Dr. Akanksha Rana¹, Dr. Kalpesh Jajoria², Dr. Somlata Jadoun³, Dr. Sunil Kumar Yadav⁴, Dr. Abhilasha Meena⁵

¹PG Scholar, Department of Rachana Sharir, National institute of Ayurveda deemed to be university (de-novo), Jaipur (Rajasthan)

²PG Scholar, Department of Rachana Sharir, National institute of Ayurveda deemed to be university (de-novo), Jaipur (Rajasthan)

³ Assistant professor, Department of Rachana Sharir, Harmony ayurvedic college and hospital Firozpur, Punjab

⁴Dean (student's welfare) associate professor, Department of Rachana Sharir, National institute of Ayurveda deemed to be university (de-novo), Jaipur (Rajasthan)

⁵PG Scholar, Department of Rachana Sharir, National institute of Ayurveda deemed to be university (de-novo), Jaipur (Rajasthan)

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 of ligaments/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 Dosha* vitiation occurs which settles down in the *Snayu* of the *Sharira*. In *Snayugata Vata*, there is the *Shoola*, *Kampa*, *Stambha* and if 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 *Snayu* in 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 *Dhanurveda* the term *Snayu* is cited in the context of describing the features of a bow string. *Snayu* was used as 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 kingⁱⁱⁱ.

AYURVEDA REVIEW

Definition of Snayu

Structural description of *Snayu* given by *Aacharya Dalhanavery* clearly that *Snayu* is *Shanakaar*.^{iv} *Acharya Sharnghadharatold* *Snayu* as a structure which support the body through binding *Mamsa*, *Asthi* and *Medas*.^v According to *Chakrapanithese Snayu, Sira* etc. are binding structure of the body. These are prepared by essence part of food in the body. *Snayu* binds the *Mamsa*, *Asthi* and *Meda* powerfully and as these are stronger than *Sira*, can bind the joints also very strongly^{vi}.

Utpatti of Snayu

The *Siras* derives *Sneha* part from the *Meda* after which they get converted into the *Snayu*. The *Paaka* of the *Siras* is *Mrudu* while that of *Snayu* is *Khara* and this is the difference between *Siras* and *Snayu*.^{vii}

The essence of *Meda* is the *Asthi*, *Snayu* and *Sandhi*; and its waste is *Sveda*.^{viii}

Snayu Sankhya

In *Sushruta Samhita* *Snayu* are nine hundred in numbers^{ix};

Total number of Snayu = 900						
Shakha (Extremities) 600 = (150 x 4)	Anguli (30)	PadaTala, PadaKurcha and Gulpha (30)	Janu (10)	Jangha (30)	Uru (40)	Vankshana (10)
Madhya Sharira (trunk) 230	Kati(60)	Prustha(80)	Parshva(60)	Uras (30)		
Shirogreva (head & Neck) 70	Griva(36)		Murdha(34)			

Snayu Bheda (Types of Snayu)

Snayu are of four kinds^x.

S.No	Type	location
1.	Pratanvati (tendrill like)	Shakha (extremities) and Sarva Sandhi (all bony joints).
2.	Vrutta (round/ring like)	Kandara
3.	Prathu (flat)	Parshva (flanks), Uras (chest) Prustha (back) and Shir (head).
4.	Sushira (having lumen)	terminal part of Amashaya (stomach), Pakvashaya (large intestine) and Basti (urinary bladder).

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 *Sandhi* makes person indolent when injured and injury to these is not as severe to *Sanayu*. *Snayu* effects body badly when injured or diseased^{xi}. All the parts of the human body are compactly held together by *Snayus*. The *Maamsa*, *Asthi* and *Meda* of the human body are binded together by the *Snayu*.

Snayu in reference of Kala

According to *Acharya Sushruta Kala* can be seen as *Snayu Praticchanat* that is *Kala* is covered by *Snayu*.^{xii}

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^{xiii}.

Snayu in concept of Basti

Basti is situated in between umbilicus, back, planks, scrotum, rectum, groins and penis, having one orifice and thin skin, placed with its faced downwards. *Alabu* shaped *Basti* is supported by *Sira* and *Snayu*^{xiv}.

Concept of Snayuarma

The muscles on the sclera increases in thickness becoming rough and white in colour is called as *Snayuarma*^{xv}.

Snayu as Mastulunga Moola

Snayu is *Moolasthana* of *Mastulunga* according to *Kashyapa Samhita*^{xvi}. *Mastulunga* has been explained as a type of *Medas* in *Sushruta Samhita*^{xvii}.

Clinical aspect of Sanayu- Snayu Gatavata

Vayus Tantra Yantra Dharah which means *Vata* in its normal state bears all the organs of the body and its functions^{xviii}. 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 Prakupit Vayu* gets situated in *Snayu*. The *Lakshanas* of *Snayu Gatavata* are described by various *Acharyas*. *Vahayama*, *Antaryama*, *Khali*, *Kubajta*, *Sarvanga Vata*, *Ekangavata*, *Stambha*, *Kampa*, *Shoola*

DISCUSSION

While etymological review, we get a few instances that *Snayu* is a structure which binds the *Anga-Pratyanga Sandhi* together. 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. *Snayu* is 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 Avayava*. 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 bearing 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 *Methrayani Upnishad* it is explained that the body is basically formed by bones cemented strongly by *Snayu* which is covered by *Mamsa* and *Shonita* 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.

Bharthuhari in *Neeti Shatak* 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 *Snayu* as 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 *Aashya* in the body. It is formed by three components *Snayu Praticanna*, *Jarayu Santat* and *Shleshma Veshita*. *Kala* is said to be protected by *Snayu Praticanna*, or covered by *Jarayu Santat* with or without *Shleshma Veshita* (a thin film of serous spread over them). In the end we can deduce that *Snayu Praticanna*, *Jarayu Santat* and *Shleshma Veshita* 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 *Dhamni*. 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 *Kashyapa Samhita*. *Acharya Dalhana* described *Mastulunga* as *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 Shamgdhara*, *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 *Snayu* are of four types-

1. *PratanvatiSnayu*
2. *VruttaSnayu*
3. *SushiraSnayu*
4. *PrathuSnayu*

PratanvatiSnayu–

Pratan means a tendril or a shoot or a spreading creeper. These are said to be present in *Shakha* and all *Sandhi*. So *Pratanavati* type of *Snayu* supposed to 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 *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 ring like. *Acharya Sushruta* 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 word *Prathula* is a broad or large. So, these structures should be Large, broad and flat. The *PrathuSnayu* is found to be present in *Parshva*, *Uras*, *Prustha* 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-lumber fascia can be seen as an example of *PrathuSnayu*. It is situated in the *Prishtha* Bhaga and covers the deep muscle of the back of the trunk. The thoraco-lumber fascia in the thoracic region (*uras*) is a thin fibrous lamina that covers the extensor muscle of the vertebral column. Thoraco-lumber fascia does its job by connecting the spines of thoracic vertebrae to the angles of the ribs and holds them in position similarly in the lumber 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 *PrathuSnayu* as mentioned by *Acharya Sushruta Parshva*, *Uras*, *Prishtha*, *Shir* regions 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 Sushruta* described *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 or organs with lumen and hold these hollow organs (viscera). The structures which show similarity to *Sushira Snayu* 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*. The *Lakshanas* of *Snayugata vata* unfolded by *Acharya Sushruta* are *Shoola*, *Stambha* and *Kampaw* which can be correlated with the signs and symptoms of *Tennis Elbow* if happening *Kurpara Sandhi* and other diseases according to place. Additionally, *Snayu* are present in close relation to *Sandhis* (bony joint) troubled *Vyana Vayu* can interrupt the normal functions of *Snayu* also. Involvement of *Marma*, *Vata Dosha* and *Dhatuvaishamyam* make disease more *Kashṭa 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.

Pratanavati Snayu – Ligaments of the limbs and nerve

Vrutta 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*, *Aticheṣṭa* (Excessive physical exercises/movements) and *Abhigata* (*Kurpara Marma Abhigata*) are the major contributory *Nidan* which leads to the vitiation of *Sthanika 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.

REFERENCES

- ⁱ(Raja Radhakant Dev. Shabdakalpadruma; Volume 5, 3rd Editions, Varanasi: Chaukhambha Sanskrit Series; 1967page no. 456)
- ⁱⁱ(Amarasinha. Haragovinda Shastri, Editor. *Amarakoṣa*. Varanasi: Chaukhambha Sanskrit Sansthan; 2006. amarkosh 2nd kand, manushya varg, page no. 6259)
- ⁱⁱⁱ(Pandit Shri Rama Sharma Editor. *Agni Puruṣa* (2nd *Khaṇḍa*). 1st Edition. Varanasi: Sanskrit Sansthan; 1957. Chapter 281 verse 28 Page no.574)
- ^{iv}(*Sushutra*, Vaidya Jadavji Trikamji acharya and Narayana Ram acharya ‘Kavyatirtha’, editors. *SushrutaSamhita* with Nibandhasangraha Commentary of Shri Dalhanacharya and the Nyayacandrika Panjika of Shri Gayadasacharya on Nidanasthana in Sanskrit. Varanasi: Chaukhamba Orientalia; Reprint 2013. *SutraSthana* chapter 25 verse 20. Page no.119)
- ^v(PanditSharngadharaAcharya, *Sharngadhara Samhita* Annotated with DipikaHindi Commentary by Bramanand Tripathi, Varanasi: Chaukhambha Surabharati Prakashaana; Reprint 2010. Chapter 5 Verse 55page no. 62)
- ^{vi}(Bramha Sankara Misra, Rupalalji Vaisya. Bhavaprakasa-Purva Khanda,Vidyothini Hindi Commentary. 9thEdition. Varanasi: Chawkamba Sanskrit Sansthan 12th edition. 2016. Chapter 3 verse 259page no.79)
- ^{vii}(*Sushutra*, Ambika Dutta Shastri, *SushutraSamhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan, Reprint 2009Volume 1, *SharirSthana* Chapter 4 Verse 29Page 42)
- ^{viii}(*Vagbhata*, Prof. Jyotir Mitra, editor. *Ashtanga Sangraha* with Shashilekhacommentary of *Indu*. 2ndEdition. Varanasi: Chaukhamba Sanskrit Series office; 2008. *ShariraSthana* chapter 6 verse 44. Page no. 316.)
- ^{ix}(*Sushutra*, Ambika Dutta Shastri, *Sushutra Samhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan.Reprint 2009 Volume 1, *SharirSthana* Chapter 5 Verse34-37. Page 38)
- ^x(*Sushutra*, Ambika Dutta Shastri, *Sushutra Samhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan.Reprint 2009 Volume 1, *SharirSthana* Chapter 5 Verse38-40 Page 62)
- ^{xi}(*Sushutra*, Ambika Dutta Shastri, *Sushutra Samhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan.Reprint 2009 Volume 1, *SharirSthana* Chapter 5 Verse41- 44. Page no.62-63)
- ^{xii}(*Sushutra*, Ambika Dutta Shastri, *Sushutra Samhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan.Reprint 2009 Volume 1, *SharirSthana* Chapter 4 Verse7, Page no. 38)
- ^{xiii}(*Sushutra*, Ambika Dutta Shastri, *Sushutra Samhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan,Reprint 2009 Volume 1, *SharirSthana* Chapter 4 Verse 8, Page no. 39)
- ^{xiv}(*Sushutra*, Ambika Dutta Shastri, *Sushutra Samhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan, Reprint 2009Volume 1, Nidan Sthan Chapter 3 Verse 18-19. Page no.313)
- ^{xv}(*Sushutra*, Ambika Dutta Shastri, *Sushutra Samhita* with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Varanasi: Choukhambha Sanskrit Sansthan,Reprint 2009 Volume 2, *utartantra* Chapter 4 Verse6.Page no. 26)
- ^{xvi}(Vrdha Jivaka, Hemraj Sharma, Shri Satyapala Bhishagacharya. *Kashyapa Samhita* revised by Vatsya with Sankrit Introduction by Pandit Hemraj Sharma and Vidyotini Hindi Commentary by Shri Satyapala Sharma Reprint 2013.*ShariraSthana*. Kahndit Part Page no. 66)
- ^{xvii}(*Sushruta*. Vaidya Jadavji Trikamji acharya and Narayana Ram acharya ‘Kavyatirtha’, editors. *Sushruta Samhita* with Nibandhasangraha Commentary of Shri Dalhanacharya and the Nyayacandrika Panjika of Shri Gayadasacharya on Nidanasthana in Sanskrit. Varanasi: Chaukhamba Orientalia; Reprint 2013. *SutraSthana* chapter 23 verse 12. Page no.112).
- ^{xviii}(Acharya Vidyadhar Shukla and Prof. Ravi Dutt Tripathi, *CharakaSamhita* of Agnivesha,Chaukhamba Sanskrit Pratishthan, Delhi,Reprint Edition 2011, Vol 1, *Vatakalakaliya* Adhyaya, Chapter 12, Page No.185)