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CLINICO-ANATOMICAL REVIEW OF SNAYU WITH SPECIAL REFERENCE TO SPRAIN

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ABSTRACT

Snayu is the most important structure of the human body which helps to maintain the weight carrying capacity of the joint and plays a crucial role during the movement of joint. Depending upon the shape and their locations, the *Snayu* is classified into four types, *Pratanvati*, *Vritta, Sushira* and *Prithula*. *Snayu* has also a very close relation with functional element called *Vata*. When aggravated *Vata* located in *Snayu*, symptoms like pain, stiffness, swelling, improper or painful movement of the joint are produced. The *Snayu* is much similar to the ligament. Any injury to the ligament is known as sprain and its symptoms are same as the symptoms of *Snayugata Vata*. At present time, sprain is most common in sportsman and hard workers. So, the complete knowledge of *Snayu* is very essential to become a good physician and surgeon also.

Keywords: *Snayu, Kandara, Vata, Sandhi, Asthi*, Ligament, Tendon, Sprain

INTRODUCTION

In human body, every structure has a great importance for many types of functions. *Sandhi* (joint) is important for locomotion and other functions. The strength of joint depends upon the *Snayu, Asthi* and *Mamsa*. *Snayu* maintains the stability of joint during movement of the body. Any traumatic injury to the joint causes severe pain, swelling, sprain and improper movement of the joint. Sprain is commonly caused by excessive stretch of ligaments and is classified into first, second and third degree.

Snayu-:

Snayu is mentioned as '*Vatavaha nadi'*; means the structure which carrying *Vata* in the body[1]. *Snayu* binds the *Mamsa* (muscle) and *Asthi* (bone) in the body[2] and is considered as the *Upadhatu* of *Medodhatu*[3]. *Acharya Vagbhat* has also explained that *Asthi, Sandhi* and *Snayu* are the *Saar* (essence) of *Medodhatu*[4]. The *Mastulunga* (brain) is described as the *Moolasthan* (root) of *Snayu* by *Acharya Kashyapa*[5].

According to *Acharya Sushrut, Snayu* are 900 in number which of them, 600 are present in *Shakha* (extremities), 230 in *Koshtha* (trunk) and 70 in *Griva* (neck) and above[6]. *Acharya Charak*[7] and *Vagbhat*[8] have also the same opinion about the number of *Snayu. Asthi* are the deepest structure of the body which are bound by *Snayu* and covered by

Mamsa. These all get nourishment through *Sira* (vessel) and covered and protected by Skin externally[9].

Classification of Snayu-:

Depending upon the shape and locations, the *Snayu* are classified into four types[10]--

1. *Pratanavati*-: means branched like tendril of leaf. These are present in *Shakha* (extremities) and all *Sandhi* (joints) of the body.
2. *Vritta*-: these are rounded or cylindrical in shape and are known as *Kandara* by the experts.
3. *Sushira*-: means hollow or ring like and are present at the ends of *Amashaya* (stomach), *Pakvashaya* (large intestine) and *Basti* (urinary bladder).
4. *Prithula*-: thick or flattened *Snayu* are present in *Parshva* (side), *Uras* (chest), *Prishtha* (back) and *Sira* (head) of the body.

Importance of Snayu-:

1. Just as a boat made by wooden planks placed side by side when bind tightly by ropes in many ways becomes capable to carry weight in water, steered by a boatman, similarly the human body will be able to carry weight, so long as the *Sandhi* (bony joints) are bind tightly by *Snayu* in many ways.
2. The injury to *Asthi* (bones), *Peshi* (muscles), *Sira* (vessels) and *Sandhi* (joints) may not be as severe as to injury of *Snayu*.
3. The physician who understands clearly all the *Bahya* (external) and *Abhyantar* (internal) *Snayu*, will capable to extract the foreign body situated deep inside the body[11].

Snayu marma-:

There are 107 *Marmas* (vital points) in the human body. These are of five kinds such as *Mamsa*, *Sira, Snayu, Asthi* and *Sandhi marma*, which of them *Snayu marma* are 27 in number. *Snayu Marma* are four *Aani*, two *Vitapa*, two *Kakshadhara*, four *Kurcha*, four *Kurchasira*, one *Basti*, four *Kshipra*, two *Amsa*, two *Vidhura* and two *Utkshepa*[12]. *Snayu marma* are the specific vital points located in the body, characterized by the predominance of *Snayu* (ligaments)[13]. Injury to these *Snayu marma* mostly leads to *Vaikalya* (deformity) in the body or body parts except *Kshipra, Basti* and *Utkshepa marma*[14].

Snayu vikara-:

Acharya Charak stated that *Doshas* vitiated in *Snayu, Sira* and *Kandara* afflict the person with *Stambha* (stiffness), *Samkocha* (contraction), *Khalli* (twisting pain in upper and lower limbs), *Granthi* (nodules), *Sphurana* (throbbing) and *Supti* (numbness)[15]. *Acharya* also explained, when aggravated *Vata* located in *Snayu*, it produces *Bahyayama* (opisthotonus), *Antarayama* (emprosthotonus), *Khalli, Kubjata* (kyphosis) and other generalized or localized disorders[16].

Acharya Sushrut has described that aggravated *Vata* localized in *Snayu* and it gives rise to *Stambha* (stiffness), *Kampa* (tremor), *Shula* (severe pain) and *Akshepana* (convulsions)[17]. *Kubjata, Shariravayava Avasad* (debility of body parts), *Kriyasvashakti* (inability to perform their actions), *Ruja* (severe pain), wound healing after a long time should be understand as caused due to injury to the *Snayu*[18].

Treatment of *Snayu vikara*-:

Sneha (oleation), *Upanaha* (type of fomentation), *Agnikarma* (cauterization), *Bandhan* (bandaging) and *Mardan* (massage) are used to cure or manage the aggravated *Vata* located in *Snayu, Sandhi* and *Asthi*[19].

Ligament-:

Ligaments are fibrous bands which connect the adjacent bones, forming integral parts of the joints. They are tough and unyielding but at the same time are flexible and pliant, so that the normal movements can occur without any resistance but the abnormal movements are prevented[20]. According to composition they are two types. Most are composed of dense bundles of collagen fibers and are unstretchable un-

der normal conditions but if the stress is continued for an excessively long period then stretch. These ligaments are called fibrous ligaments. The second type is composed largely of elastic tissue and can therefore regain its original length after stretching. These ligaments are called elastic ligaments[21].

Ligaments are usually considered as degenerated tendons of the related muscles such as tibial collateral ligament is degenerated tendon of adductor magnus muscle[22]. The ends of a muscle attached to bones, cartilages or ligaments by cords of fibrous tissue are called tendons. Occasionally, flattened muscles are attached by a thin but strong sheet of fibrous tissue called aponeurosis[23].

Cinical Anatomy of Ligaments-:

Joint ligaments are very prone to excessive stretching and even tearing and rupture. If possible, the opposing damaged surfaces of the ligament are brought together by positioning and immobilizing the joint. The blood clot at the damaged site is invaded by blood vessels and fibroblasts. The fibroblasts lay down new collagen and elastic fibers, which become oriented along the lines of mechanical stress[24].

Sprain-:

Undue stretching and tearing of the fibers of a ligament due to an injury is known as sprain. It causes severe pain and effusion into the ligament and joint. This is to be differentiated from the term 'strain' which means stretching of a muscle or its tendinous attachment[25].

Acute sprains of the lateral ankle are usually caused by excessive inversion of the foot with plantar flexion of the ankle. The anterior talofibular ligament and the calcaneofibular ligament are partially torn, giving rise to great pain and local swelling. Acute sprains of the medial ankle are similar to but less common than those of the lateral ankle. They may occur to the medial or deltoid ligament as a result of excessive eversion. A fall on the outstretched hand can sprain the ligaments of the wrist joint, producing synovial effusion, joint pain and limitation of movement[26].

Classification of Sprain-:

Sprains are classified into three degrees[27]—

1. First degree sprain-: It is a tear of only a few fibers of the ligament and is characterized by minimal swelling, localized tenderness but little functional disability.
2. Second degree sprain-: It is the one where anything from a third to almost all the fibers of a ligament are disrupted and is characterized by pain, swelling and inability to use the limb, joint movements are normal.
3. Third degree sprain-: It is a complete tear of the ligament. There is swelling and pain over the torn ligament.

A localized swelling, tenderness and ecchymosis over a ligament indicate injury to that ligament. Usually a haemarthrosis is noticed in second and third degree sprains within two hours. Stress test is a very useful test in diagnosis a sprain and judging its severity.

Treatment of Sprain-:

Treatment of first degree sprain is symptomatic, a little or no immobilization is necessary. The patient usually returns to activity within a few days. A second degree sprain is treated by immobilization for 4 to 6 weeks, followed by gradual mobilization. A third degree sprain requires a surgical repair in most cases. Unrestricted weight-bearing is permitted in second and third degree sprains only after three months[28].

DISCUSSION

Snayu is defined as *Vatavaha nadi* and *Vata* is responsible for any type of pain in the body. It may be the reason why injury to *Snayu* leads severe pain than any other structure in the body. *Prana vayu* which is located in *Murdha* (head) may be travelling through *Snayu* throughout the body that's why the

Mastulunga is considered as the *Moolasthan* of *Snayu*.

Snayu is an *Upadhatu* of *Medodhatu* and are 900 in number. The main function of *Snayu* is to bind the *Mamsa* (muscle) and *Asthi* (bone). In *Ayurveda, Snayu* are mentioned not as single structure, but are explained as four different types of structure.

Anatomically, *Pratanavati Snayu* is similar to the ligaments which are fibrous threadlike structure, present in the joints and connect the adjacent bones. *Vritta snayu* is cylindrical in shape and may correlate with fibrous cord like structure called tendons. *Sushira snayu* is ring like and present at the end of stomach, large intestine and urinary bladder. According to modern anatomy, there are circular muscles called sphincter such as cardiac, pyloric and urethral sphincters. The function of sphincter is to open and close the orifices. So, we can consider the *Sushira snayu* as sphincters. *Prithula snayu* is flattened and present chest, side, back and head of the body. It may correlate with aponeurosis because it is flattened and connects the muscle to the bone. *Snayu marma* is the specific vital point with the predominance of *Snayu*. Therefore, the injury to this *marma* mostly leads to *Vaikalya* (deformity) in the body.

According to *Ayurveda*, diseases related to *Snayu* are mainly affected by vitiated *Vata* and disease is called *Snayugata Vata*. The main symptoms of *Snayugata Vata* are severe pain, stiffness of the joint, delay healing of wound, inability to movement of joint etc. Thus, show the relief in symptoms when treated with the regimen of vitiated *Vata* in this type of disease. The general treatments for *Snayugat Vata*, mainly *Snehana, Swedana, Agnikarma, Basti, Bandhan, Mardhan* and so on, as per the requirement of diseases are used.

Ligament is the strong fibrous band which connects bones especially at joints, where there are forces tending to separate adjacent bones. Ligament is much similar to *Pratanavati Snayu.* Ligament injury called sprain occurs when ligament is stretched beyond its normal limit. Symptoms of sprain are same as the symptoms of *Snayugata Vata* especially *Pratanavati Snayugata Vata*. So, we can correlate the *Pratanavati Snayugata Vata* with sprain. According to severity of injury, the sprain is classified into three grades. The immobilization of joint is first requirement as a treatment of sprain which is performed by bandaging of joint and then other symptomatic treatments are provided. Sometimes, surgery is required in many critical cases of sprain.

CONCLUSION

In Ayurveda, the description of *Snayu*, regarding its structure, location and clinical aspects are very meaningful. *Snayu* is an important structure which binds the Mamsa and Asthi; so, it may be ligament, tendon, aponeurosis or sphincter muscles also; but the ligaments are appropriate structure for the term Snayu. It has a close relation with *Vata dosha* while *Snayugata Vata* is a painful clinical condition of the joint which occurs due to aggravated *Vata* and is treated by regimen of *Vata* with bandaging of the joint. According to symptoms, clinical conditions and treatment, the *Pratanavati Snayugata Vata* can be correlated with sprain. Therefore, the complete knowledge of *Snayu* is very much essential for surgeons, as well as physicians.

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