CONCEPT OF SANDHI SHARIR IN AYURVEDA

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ABSTRACT

The meaning of word Sandhi is “the meeting point of two or more structures.” According to modern joint is a point where two or more bones are articulates with each other. Aacharya Sushruta has quoted that although there are numerous Sandhi in our body which cannot be counted so only Asthi Sandhi should be considered while enumerating Sandhis. There are two hundred and ten Sandhi in the human body. Sushruta has classified Sandhi on the following basis: (a) On the basis of function (movements) are classified into Cheshtavanta and Sthira Sandhi while Aacharya Gananatha Sen has classified Sandhis on the basis of movements as Bahucheshta, Alpachineshta, Acheshta. (b) On the basis of structure are classified into 8 types i.e. Kora, Ulukhala, Samudga, Pratara, Tunnasevani, Vayasatunda, Mandala and Shankhavarta. A thorough knowledge of the structure and function of the joint is required to diagnose and treat the diseases of joints. So the knowledge of anatomy of joints should be known.

Keywords: Cheshtavanta Sandhi, Joint, Sandhi, Sandhi Sankhya, Sthira Sandhi

INTRODUCTION

In Ayurvedic literature Atreya, Dhanvantari and all other communities have made it important the knowledge of body to have undoubtedly for the sake of knowledge.

The definition of Sandhi in various Ayurvedic grammatical literature are given as “the union” or “to unite” or “the meeting point of two or more structures.” Regarding this Aacharya Sushruta has quoted that although there are numerous Sandhi in our body which cannot be counted so only Asthi Sandhi should be considered while enumerating Sandhis.

In our Ayurvedic classics different Aacharyas have mentioned different numbers of Sandhi. According to Aacharya Sushruta Sandhis are 210 in number, which are responsible for various movements, and are distributed throughout the body.

In Ayurvedic Samhitas the description of anatomy of Sandhi in detail is not found. It is ob-
served that the incidence of joints disorders are increasing in today’s world. It is the burning problem for both families and society. A thorough knowledge of the structure and function of the joint is required to diagnose and treat the diseases of joints.

**Ayurvedic Review**

According to Aacharya Sushruta only Asthi Sandhi should be taken into account where as other Sandhi of Peshi, Snayu and Sira are innumerable and should be excluded while counting.

**Classification of Sandhi** - Main classification is of two types.

1. Based on Kriya
2. Based on Rachana

1. **Kriyanusar Vargeekaran (Based on Movement):** The Sandhis are of two types.
   
   i. **Cheshhtavanta Sandhi**
   
   ii. **Sthira Sandhi**

   The Sandhis which are situated in the Shakhas, Hanu and Kati are Cheshtavanta Sandhi while all the remaining Sandhi comes under the Sthira in nature.

   The Cheshtavanta Sandhis are further classified into two types based on their extent of movement.

   They are-

   1. Bahu chala (freely movable)
   2. Alpachala (slightly movable)

   The Sandhi of Shakhas, Hanu and Kati are Bahu chala variety and the Sandhi of Prushtha etc. are Alpachala variety.

2. **Rachhananusar Sandhi Vargeekaran (Based on structure):**

   Based on the structure Aacharya Sushruta had described eight types of Sandhi. They are Kora, Ulukhala, Samudga, Pratara, Tunnaeva, Vayastunda, Mandala and Shankhavarta.

   **Kora Sandhi**

   As per the description of Haranchandra in commentary of Sushrut Samhita, Kapat etc. is taken for Nibandhan of a special devise called Kora is known that the Kabja (hinge). The Kora Sandhi is seen in the following region: Anguli, Manibandha, Gulpha, Janu and Kupara.

   **Ulukhala Sandhi**

   These types of Sandhi look like stone grinder used in the kitchen in olden days that’s why it is named so. The Ulukhala variety of joints is found at Kaksha, Vankshana and Dashana.

   **Samudga Sandhi**

   This variety of Sandhi looks like a box. These Samudga Sandhis is seen at Ansapeeth, Guda, Bhaga and Nitamba.

   **Pratara Sandhi**

   According to Dalhana, the articulating surfaces of this variety of joint are flat in nature and floating, supported by cushion and friction is seen in between the articulating surfaces. In Sushruta’s opinion this variety of joints are located at Greeva and Prushthavansa.

   **Tunnasevani Sandhi**

   The commentator Gananath Sen has opined that articulating surfaces resembles dentate edges which are supported and stucked together or embedded into one other. This type of Sandhi is found at Sirakapala and Katikapala.
Vayastunda Sandhi
According to Gananatha Sen the Hanu which is situated within Shankhasthi is considered as Vayastunda Sandhi. Even Sushruta has got similar opinion about Vayastunda Sandhi.

Mandala Sandhi
According to Dalhana the Sandhi, which are oval or round are called as Mandala Sandhi. This type of Sandhi is present in Kantha, Hrudaya and Netra.

Shankhavarta Sandhi
According to Haranachandra, these are circular in nature which resembles the circles of a snail or Shankha. According to Sushruta they are found in Shrotra and Shringataka.

Sandhi Sankhya:
According to Aacharya Charaka, Sandhi in body. According to Aacharya Sushruta, Body comprises 210 Sandhi. Of these sixty-eight are in the four extremities; fifty-nine in the trunk (Koshtha); and eighty-three in the neck and the region above it.

Modern review
Joints (articulations) are unions or junctions between two or more bones or rigid parts of the skeleton. Joints exhibit a variety of forms and functions. They are constructed to allow for different degrees and types of movement.

Definition
- Joint is a junction two or more bones or cartilages.
- An articulation is a point of contact between bones between cartilages and bones, or between teeth and bones.

Classification of joints
Joints are classified structurally, based on their anatomical characteristics, and functionally, based on the type of movement they permit. Functionally, joints are classified as one of the following types:
- Synarthrosis: An immovable joint.
- Amphiarthrosis: A slightly movable joint.
- Diarthrosis: A freely movable joint.

Structurally, joints are classified as one of the following types: Fibrous joints, cartilaginous joints, Synovial joints

1. Fibrous Joints
There is no synovial cavity, and bones are held together by dense irregular connective tissue. Fibrous joints permit little or no movement. The three types of fibrous joints are sutures, syndesmoses and interosseous membranes.

2. Cartilaginous Joints
Like a fibrous joint, a cartilaginous joint lacks a synovial cavity and allows little or no movement. Here the articulating bones are tightly connected by either hyaline cartilage or fibrocartilage. The two types of cartilaginous joints are primary cartilaginous and secondary cartilaginous joint.

3. Synovial Joints
Synovial joints have certain characteristics that distinguish them from other joints. The unique characteristic of a synovial joint is the presence of a space called a synovial (joint) cavity between the articulating bones. Because the synovial cavity allows a joint to be freely movable, all synovial joints are classified functionally as diarthroses. The bones at a synovial joint are covered by a layer of hyaline cartilage called articular cartilage. The carti-
lage covers the articulating surface of the bones with a smooth, slippery surface but does not bind them together. Articular cartilage reduces friction between bones in the joint during movement and helps to absorb sock.

**Synovial fluid**
The synovial membrane secretes synovial fluid, a viscous, clear or pale yellow fluid named for its similarity in appearance and consistency to uncooked egg white.

**Types of Synovial joint**
Although all synovial joints are similar in structure, the shapes of the articulating surfaces vary; thus, many types of movement are possible. Synovial joints are divided into six categories based on type of movement: planar, hinge, pivot, condyloid, saddle and ball-and-socket.

**Planar joints**-The articulating surfaces of bones in a planar joint are flat or slightly curved. Planar joints primarily permit back-and-forth and side-to-side movements between the flat surfaces of bones.

**Hinge joints**-In a hinge joints, the convex surface of one bone fits into the concave surface of another bone. As the name implies, hinge joints produce an angular, opening-and-closing motion like that of a hinged door.

**Pivot joints**-In a pivot joint, the rounded or pointed surface of one bone articulates with a ring formed partly by another bone and partly by a ligament.

**Condyloid joints**-In a condyloid joint or ellipsoidal joint, the convex oval-shaped projection of one bone fits into the oval-shaped depression of another bone.

**Saddle joints**-In a saddle joint, the articular surface of one bone is saddle shaped and the articular surface of the other bone fits into the “saddle” as a sitting rider would sit.

**DISCUSSION**
In *Ayurvedic* classics *Sandhis* have been classified into eight types by taking account of shapes of *Sandhis* mainly, movement of *Sandhis* has not been considered whereas in modern science, the classification of *Sandhis* has been done by taking account of both structure and function (movement).

**Kora Sandhi**
*Kora Sandhi* is like *Garta* (pit). According to modern *Anguli Sandhi* (Interphalangeal joint), *Gulpha Sandhi* (Ankle joint), *Koorpara Sandhi* (Elbow joint) are hinge variety of synovial joint. *Manibandha Sandhi* (Wrist joint) is ellipsoidal variety of synovial joint and *Janu Sandhi* (Knee joint) is Compound synovial joint, in which two condylar joints between the condyles of the femur and tibia. So on the basis of shape of articulating surfaces hinge joint, ellipsoid joint and condylar joint can be included in *Kora Sandhi* of *Ayurveda*.

**Ulukhala Sandhi**
In this type of *Sandhi* one bone has mortar like structure which unites with pestle like head of another bone. *Kaksha Sandhi* (Shoulder joint) and *Vankshana Sandhi* (Hip joint) are ball and socket joints. *Dashana Sandhi* is gomphosis joint. A gomphosis is a specialized fibrous joint in which a conical process or peg of one bone fits into a hole or socket in another bone. So on the basis of shape of articulating surfaces ball and socket joint and gomphosis joint can be included in *Ulukhala Sandhi*.

**Samudga Sandhi**
These Sandhis have articulating ends which look like a Samputa (box) or an enclosed shell. Ansapeetha (Acromioclavicular joint) and Nutamba (Sacroiliac joint) are plane joints. Guda (Sacrococcygeal joint) and Bhaga (Pubic symphysis) are Secondary cartilaginous joints. So on the basis of shape of articulating surfaces plane joints and secondary cartilaginous joints can be included in Samudga Sandhi.

Pratara Sandhi
In Ayurvedic classics has mentioned that these types of joints are formed from articulation of ‘Samatala’ or flat part of slightly movable bony parts. Greevavansha and Prushtavansha are Intervertebral joints. The joint between the vertebral bodies is secondary cartilaginous joint. So on the basis of shape of articulating surfaces secondary cartilaginous joints can be included in Samudga Sandhi.

Tunna Sevani Sandhi
Tunna Sevani is a suture type of joint. Shirokapala and Katikapala have sutural joints. So sutures can be included in Tunnasevani Sandhi.

Vayastunda Sandhi
Where Sandhi is like beak of crow is regarded as Vayastunda Sandhi. Hanu Sandhi (Temporomandibular joint) is the condylar joint. So condylar joint can be included in Vayastunda Sandhi.

Mandala Sandhi
Sushruta classified Sandhi into two types. Those which can be counted and are between the bones and another type of joints are countless as these are the joints or junctions between Peshi (muscles), Snayu (tendons), Sira (vessels). Later type of junction is present in Kantha (larynx), Hrudaya (heart), eyes and Klom Nadi (trachea) as Sandhi. In Netra joints between five Mandalas form six Sandhis.

Shankhavarta Sandhi
Here the manning of Shankhavarta should be taken as irregular structure. By Shankhavarta Sandhi it should be consider a joint of irregular structures (or irregular form). The word Sandhi in Ayurvedic classics do not focus on joints of bones only, it may be joints between two cartilages or between two Peshi (muscles), Snayu (tendons) and Sira (vessels). Shrotra is mentioned in classics as a Shankhavarta Sandhi. So on going through the anatomy of the ear it is found that the joint of ear ossicles along with cochlea can be considered as Shankhavarta Sandhi in Shrotra.

The location of Shringataka is not clearly described in classics. So on going through the study of Shringataka Marma scholars have Shringataka Marma in nose. So the Sandhi should be present in nose as conchi, which is present as irregular form like Shankhavarta.

CONCLUSION
The various classical texts of Ayurveda have defined Sandhi are meeting place of two or more Asthis. Ayurveda and modern science both are same classification basis on the structural and function. Kora Sandhi can be considered as hinge joint, Ulukhala Sandhi may include ball and socket variety of synovial joint and gomphosis variety of fibrous joint. Ansapeetha, Guda, Bhaga, Nutamba has Samudga Sandhi can be considered as acromioclavicular, sacrococcygeal, pubic symphysis, and sacroiliac joint respectively. In Pratara, Greeva and Prushtavansha may include intervertebral joint. Sutures as Tunnasevani and Hanu in
Vayasatunda may be taken a tempomendibular. Sankhavartha include Shrota and Shringataka can be correlated with cochlea and region of nasal conchae.

REFERENCES


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