

AN ANATOMICAL STUDY OF SANDHI W.S.R. TO ITS CLINICAL RELEVANCE**Dr. Snigdha Sharma^{1*} and Dr. Kuldeep Kumar²**^{1*}P.G. Scholar, ^{2*}Lecturer

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Article Received on
11 October 2023,Revised on 31 Oct. 2023,
Accepted on 21 Nov. 2023

DOI: 10.20959/wjpr202321-30234

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The concept of Sandhi is presented in several ayurvedic Samhita in Ayurveda. Meaning of the word Sandhi is union, to unite, or meeting place of two or more structures. According to Acharya Sushruta, there are numerous sandhi in our body so only Asthi Sandhi should be considered as sandhi. On the basis of shape and movement, Sandhi is classified into 2 - chetanavant and sthir. The bones, essential for supporting the body, are interconnected through joints, allowing proper positioning and movement. Joint disorder is increasing day by day. Joint disorders, termed as 'Arthropathy', include conditions like arthritis, where inflammation affects one or more joints. Polyarticular arthropathy involves multiple joints, while monoarticular arthropathy affects only one joint.

KEYWORDS: Sandhi, Asthi, Sthira, Chetanavant, Joint, Arthropathy.**INTRODUCTION**

Ayurveda is one of the oldest medical system and remain one of the India's traditional healthcare systems. The word "sandhi" is derived from the root 'Sam+Dha+Ki', which means holding together, Joining, and binding. Sandhi is a place where asthi are joined together. Sandhis are the seat of Kapha and are located at the Bone joint. Sandhis, interpreted as intersections or unions of structures, These Sandhis help to hold body components together, forming the basis for movement and stability. If this definition is used, then the Body has an infinite number of joints or Sandhis. To make it simpler, just Asthi Sandhi Should be included; other Sandhi from Peshi, Snayu, and Sira are countless and should not be Included when counting. Joint is made of bone and Asthi, Snayu, Slesmadhara Kala, and Slesma are

support system of joint. In the modern world, the increasing prevalence of joint issues poses a significant challenge. Understanding the joint's structure and function is vital for accurate diagnosis and treatment.

NUMBER OF ASTHI SANDHI

- Susruta Samhita – 210
- Charak Samhita – 200
- Astanga Hridaya – 200
- Astanga Samgraha – 210
- Kasyapa Samhita – 381

SHADANG VIBHAJAN

1. In four limbs: $17 \times 4 = 68$
2. In trunk: 59
3. Above head and neck: 83

Total = 210

CLASSIFICATION OF SANDHI

Sandhi is decided on the base of kriya and rachana anusar.

KRIYANUSAR VARGIKARAN

संघयस्तु द्विविधाश्चेष्टावन्तः स्थिराश्च ।

शास्त्रासु हन्वोः कट्यां च चेष्टावन्तस्तु संघयः ।

शेषास्तु संघयः सर्वे विज्ञेया हि स्थिरा बुधैः संघयः ॥

(सु.शा.5/26-27)

- Chal Sandhi
 - i. Chal sandhi are freely movable.
 - ii. Is is further decided into bahuchal and ishatchal sandhi.
 - iii. Bahuchal- shakha and hanu, ishatchal – prithvansh
- Achal Sandhi
 - i. Achal are immovable

RACHANANUSAR VARGEEKARAN

कोर-उलुखल-सामुद्ग-प्रतर-तुन्नसेवनी-वायसतुण्ड-मण्डल-शंखावताः ।।

(सु.शा.5/28)

There are 8 types of sandhi, on the basis of Rachana, they are – kora, ulukhal, samudga, pratar, tunnasevani, vayastund, mandal, sankhavart.

- 1. Kora Sandhi-** for bandhan of door and window, which device is used is kora or kabja or honge. Examples are- joint of Anguli (phalangeai), Manibandha (wrist joint), Gulpha (ankle joint), Janu (knee joint), and Kurpara (Elbowjoint)
- 2. Ulukhala Sandhi-**it's shape is like okhali and mushal. examples are -Three joints— Kaksha (shoulder joint), Vankshana (hip joint), and Dashana (Teeth)
- 3. Samudga Sandhi-** samudga means box. In this joint the surface of one bone is convex and another is concave. For example -Ansapeeth (Acromioclavicular joint), Guda (Sacrum), Bhaga (Pubis), and Nitamba (Ilium) all exhibit these Samudga Sandhis.
- 4. Pratara Sandhi-** suface of both bone are smooth. For example -cervical vertebrae (Greeva), the vertebrae (Kasherukha), and the Prushthavansha (Thoracic vertebrae).
- 5. Tunnasevani Sandhi-** It resembles like suture. For exmaple-Sirakapala (Skull) and Katikapala (Hipbone-sacrum, coccyx).
- 6. Vayastunda Sandhi-**It resembles like the beak of the crow. For example -hanu (T.M.J. / Temporo-Mandibular joint)
- 7. Mandala Sandhi** – It's shape is madalalakar or circular. For example -Clomnadi (Trachea), Kantha (Throat), Hrudaya (Heart), and Netra (Eye).
- 8. Shankhavarta Sandhi-**According to Haranachandra, Shankhavarta Sandhis are circular in shape and resemble the Shell of a snail or Shankha. For example –Shrotra (Ear) and Shringataka (Cavernus Sinus).

TYPES OF JOINT

It is based on structure and function.

➤ **Structural classification**

- Fibrous
- Cartilaginous
- Synovial

➤ **Functional Classification**

- i. Synarthrosis – immovable and further divided into Suture, gomphosis, Syndesmosis.
- ii. Amphiarthrosis – slightly moveable and further divided into synchondrosis, Synphysis.
- iii. Diaarthrosis- freely moveable and further divided into Gliding(arthrodial), Hinge (ginglymus), Pivot(trochoid), Condylod(ellipsoidal), Saddle(seller), Ball and socket(spheroid).

APPLIED ASPECT OF SANDHI

Aacharya sushrut explain sandhi mukt and kand bhagna. Disease like Sandhigata vata, Amavata, Vatarakta, Rajyakshhma etc are disease related to sandhi.

In modern anatomy, the clinical significance of joints are.

➤ Shoulder joint.

- it's dislocation is very common because its socket is quite shallow. Usually the head of humerus becomes displaced inferiorly.
- Rotator cuff injury is a common injury.
- Shoulder tip pain

➤ Elbow Joint

- Dislocation of the elbow is usually posterior aspect.
- A partial dislocation of the head of the radius present in children.
- Tennis elbow- Transverse fracture, sprain of radius collateral ligament.

➤ Wrist Joint

- The wrist joint is commonly involved in rheumatoid arthritis.
- Wrist drop is indicated radial nerve injury.

➤ Hip joint

- Fracture of the neck of femur are common in old age also called senile degeneration.
- Dislocation of the hip joint. The sciatic nerve may be damage in posterior dislocation.
- Congenital dislocation is more common in the hip
- Osteoarthritis is a disease of old age.

- Disease of the hip (like T.B.) may cause referred pain in the knee because of the common Nerve supply of the joint.
- Knee Joint
 - Dislocation of the knee joint is rare.
 - Injury to cruciate ligament.
 - Injury to menisci
 - Injury to collateral ligament.
- Ankle Joint
 - Dislocation of the ankle joint.
 - Sprains of the ankle joint.
 - Foot drop – Injury to common peroneal nerve.
 - Injury to the tibia and fibula in the region of the ankle are referred to as Pott's fracture.
 - Injury to medial ligament
 - Injury to interosseus tibio-fibular ligament.
 - Fracture of malleoli.
- Temporo-mandibular joint (T.M.J.).
 - Dislocation of mandible- During excessive opening of the mouth or during a convulsion.
 - Derangement of the articular disc may result from any injury, like over closure or Malocclusion.

DISCUSSION

Acharya Sushruta gives an accurate and adequate understanding of Sandhi and its classification. Only the Asthi Sandhi should be considered, although other sandhis have been derived like Peshi, snayu sandhi etc. Peshi, Snayu and Sira sandhi are numberless and should be ignored in calculation. After a careful reading of the conceptual literature, we see that the idea and the importance of sandhi is comparable to modern anatomy. Sandhis are performed by Panchmahabhuta and Originates from Pitraja-Bhava, like any other part of the body. Many acharya says different number of sandhi. In the clinical point view acharya Sushruta explain sandhi mukt and kand bhagna. Sandhimukta can be correlated to the dislocation of joint. Kand bhagna can be correlated to intra capsule fracture or capsular fracture. In

describing sandhigatvad acharya explain that vitiation of vata, which is situated at sandhi, is caused by hetu and can be connected to osteoarthritis, which causes a reduction in joint space or sclerotic alterations of the articular bone that result in the production of osteophytes. Explaining the vatarakta, septic arthritis might be correlated. Vitiation of vata and rakta, which are found in sandhi. Rajyakshma is a disease of kshaya that can be correlated to tuberculosis. In amavata there is a vitiation of ama and vata which is located at the kapha sthana and that are joint. So amavata can be correlated to rheumatoid arthritis. Rheumatoid arthritis is a disease of malfunction of immune system.

CONCLUSION

Sandhi is a union of two or more Asthi. They are two types chetana and sthir. Sandhi is also classified into a type according to Rachna Sharira kora, ulukhal, samudga, pratar, tunnasevani, vayastund, mandal, sankhavart. Joints are important in the view of anatomy and understanding of joint is essential in clinical practice as the problem enjoying is most common lifestyle problem. The prevalence of joint disorders is increasing steadily. Sleshak kapha found in sandhi for well functioning by lubricating them. Any harm in the sandhi can lead to mortality (destruction, degeneration or other deformity). To know their pathology we must know the Anatomy and physiology of Joint.

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