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CONCEPT OF ASTHI SANGHAT - A REVIEW

Dr. Kaushiki Pande[1], VD. Akshata Chavan[2]

[1]*Final MD Student, Department of Sharir Rachana, YMT Ayurvedic Medical College and Hospital, Kharghar, Navi Mumbai.*

[2]*Associate Proffesor, Department of Sharir Rachana, YMT Ayurvedic Medical College and Hospital, Kharghar, Navi Mumbai.*

ABSTRACT

Asthi Sanghata, as described in ancient Ayurvedic texts such as the Sushruta Samhita, Charaka Samhita, and Ashtanga Hridaya, refers to the collection or grouping of two or more bones, forming major structural and functional units in the human body. This review article explores the Ayurvedic concept of Asthi Sanghata and its anatomical significance, correlating classical descriptions with modern musculoskeletal anatomy. Fourteen principal Asthi Sanghatas are identified, including major joints like the ankle (Gulpha), knee (Janu), hip (Vankshana), wrist (Manibandha), elbow (Kurpara), shoulder (Amsa), pelvic (Trika), and cranial sutures (Simanta). These structures are essential for providing stability, support, and coordinated movement, and are closely associated with vital anatomical features such as ligaments, muscles, tendons, etc.

KEYWORDS : *Asthi sanghat, gulpha,janu,vankshan,manibandha,amsa,trika,ligaments,muscles*

INTRODUCTION

Ayurveda is a life science. It is based on 3 main *Ghranthas* commonly known as the *Brihatrayee* namely Sushrut Samhita, Charak Samhita and Asthang Hrudaya. These samhitas contain different Sthanas like Chikitsa sthana, Kalpa sthana, sharir sthana to name a few. Sharir sthana mainly describes the anatomy of human body. Fifth Adhyay of Sushrut sharir sthana is Sankhya Vyakran Adhyay which mainly describes the number of anatomical structures in the body like total number of ashaya,strotas,asthi,sandhi, snayu and mamsa peshi. Among these, *Asthi Dhatu* forms the principal framework of the body and provides support, stability, and protection to vital organs. The integrity of the skeletal system are maintained through various joints and articulatory complexes. One such important anatomical concept is *Asthi Sanghata*.

As the word suggests, Asthi means bone and Sanghat means collection or group. Asthi sanghat can be defined as a collection or group of 2 or more Asthis. The 14 asthi sanghats described in shloka are Gulpha, Janu, Vankshan in upper limbs, similarly in lower limbs, Trika and Shira.(1)

This article mainly describes the Asthi Sanghatas in detail.

Methodology

This a conceptual and literary review conducted to analyze and understand the Ayurvedic concept of *Asthi Sanghata* with its anatomical and clinical significance. The study was carried out through an extensive review of classical Ayurvedic texts, commentaries, and modern anatomical literature.

Materials and Methods

The literary materials for the study were collected from the following sources:

1. Classical Ayurvedic texts, mainly Sushruta Samhita
2. Commentaries including *Nibandha Sangraha Tika* by Dalhana
3. Modern anatomy textbooks – mainly B.D Chaurasia for anatomical correlation of Asthi Sanghata and related musculoskeletal structures.
4. Research articles, review papers, dissertations, and published journals related to Asthi Sanghata.

Aim

To study the concept of Asthi sanghat and understand its anatomical significance

Objectives

1. To Study the descriptions and interpretations of Asthi Sanghata
2. To correlate the mentioned structures with Modern Anatomy
3. To understand the anatomical locations and structural importance of Asthi Sanghats

Review of Literature

Acharchya Sushrut, regarded as the pioneer of surgery and anatomy in Ayurveda, has described fourteen (*Chaturdasha*) Asthi Sanghatas in the body. According to the classical description, three major Sanghatas are situated in each lower limb, namely *Gulpha* (ankle joint), *Janu Sandhi* (knee joint), and *Vankshana* (hip or inguinal region). Similar corresponding Sanghatas are considered in the upper limbs, which include *Manibandha* (wrist joint), *Kurpara* (elbow joint), and *Amsa Sandhi* (shoulder joint). In addition to these, *Trika* and *Simanta* are also enumerated among the Asthi Sanghatas. *Trika* is generally interpreted as the pelvic or sacral region, while *Simanta* refers to the cranial sutures of the skull. These structures are considered essential for providing stability, support, and coordinated movement to the body.

The detailed commentary of Dalhana in *Nibandha Sangraha Tika* further clarifies the concept and enumeration of Asthi Sanghatas. Dalhana also accepts the total number of Asthi

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Sanghatas as fourteen and elaborates the anatomical interpretation of the term *Trika*.(2) He explains *Trika* as *Shroni Kanda* and *Bahu-Griva Asthi*, which may be interpreted as the lower (*Adho Trika*) and upper (*Urdhva Trika*) structural complexes respectively. This interpretation broadens the understanding of Trika beyond a single anatomical location and highlights its functional importance in maintaining axial stability and limb articulation.

Furthermore, Dalhana has additionally described structures such as *Shroni Kanda* (pelvic girdle region), *Vaksha* (sternal or thoracic region), *Udara-Ura* (umbilical and thoraco-abdominal region), and *Ansakuta* (shoulder prominence region). These descriptions indicate that he considered not only freely movable joints but also structurally significant structures that contribute to bodily support and protection of vital organs. Such descriptions reveal an observational approach toward musculoskeletal anatomy in classical Ayurvedic literature.

Acharya Vagbhata has also clearly described *Gulpha*, *Janu*, *Vankshana*, *Manibandha*, *Kurpara*, *Kaksha*, *Trika*, and *Shira* as Asthi Sanghatas. (3) These structures collectively serve as sites of movement, load transmission, and help in retaining body posture.

Moreover these sanghatas also show with the presence of other important anatomical structures such as *Mamsa*, *Snayu*, *Kandara*, *Sira*, dhamani, *Jala*. They are associated with a numberous vital energy points i.e Marmas too.

These joints predominantly connect the appendicular skeleton with the axial body.

These descriptions appears to correlate closely with major joints, girdles, sutures found in modern anatomy. The concept also reflects the Ayurvedic understanding of structural integrity of the human body.

RESULTS

The tables below describe the anatomical correlation of *Asthi Sanghata* with types of joints according to modern anatomy.

1. SANGHATAS OF LOWER LIMB

Name of the sanghata	Articulating structures	Classification based on ayurvedic sandhi prakara	Classification based on modern anatomy
Gulpha	Lower end of tibia Lateral malleolus of fibula Upper, medial and lateral aspects of talus	Kora sandhi Marma sandhi	Hinge joint Synovial joint
Janu	Condyles of femur Patella Condyles of tibia	Kora sandhi Marma sandhi	Synovial joints
Vankshan	Head of femur Acetabulum of hip bone	Ulukhal sandhi	Synovial joints

2. SANGHATAS OF UPPER LIMB:

Name of the sanghata	Articulating structures	Classification based on ayurvedic sandhi prakara	Classification based on modern anatomy
Manibandha	Lower end of radius Articular disc of radioulnar joint Proximal row of carpal bones	Kora sandhi	Synovial joints
Karpur	Capitalum and trochlea of humerus Upper end of radius and ulna	Kora sandhi	Hinge variety of synovial joint
Kaksha	Glenoid cavity of scapula Head of humerus	Ulukhal sandhi	Ball and socket variety of synovial joint

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Name of the sanghata	Articulating structures	Classification based on ayurvedic sandhi prakara	Classification based on modern anatomy
Shira/simanta – 1.Coronal Suture 2.Sagittal Suture 3.Lambdoid Suture 4.Squamous Suture 5.Frontal suture	1.between the frontal bone and parietal bones 2.between the two parietal bones 3.between the parietal bones and occipital bone 4.between the parietal bone and temporal bone 5.between the two halves of the frontal bone(in infants)	Tunnsevani	Immovable fibrous joints
Trika – urdhva -Adha	-Sternoclavicular joint Acromioclavicular joint -Sacro-iliac joint Lumbo-sacral joint	Samudga sandhi	Synovial joint Secondary cartilagenous joint

DISCUSSION

The concept of *Asthi Sanghata* described in Ayurveda represents major joints of body. Important anatomical structures at the site of the shoulder joint are the glenoid labrum, rotator cuff muscles, and three bursae namely subscapular, infraspinatus, and subacromial bursae. Muscles associated with the shoulder joint include pectoralis major, deltoid, and latissimus dorsi. The arterial supply is mainly through the circumflex humeral artery, suprascapular artery, and subscapular artery. The nerves related to the shoulder joint are the axillary, musculocutaneous, and suprascapular nerves. At the site of the hip joint are the acetabular labrum, ligament of head of femur, iliofemoral ligament, pubofemoral ligament, and ischiofemoral ligament. Associated bursae include the trochanteric bursa, iliopsoas bursa, and ischial bursa. Muscles related to the hip joint include gluteus maximus, gluteus medius, iliopsoas, and adductor muscle group. The arterial supply is mainly through the medial circumflex femoral artery, lateral circumflex femoral artery, and obturator artery. Nerves associated with the hip joint are the femoral, obturator, sciatic, and superior gluteal nerves. Important anatomical structures at the site of the knee joint are the menisci, anterior cruciate ligament, posterior cruciate ligament, tibial collateral ligament, and fibular collateral ligament. Associated bursae include the suprapatellar bursa, prepatellar bursa, and infrapatellar bursa. Muscles related to the knee joint include quadriceps femoris, hamstrings, gastrocnemius, and popliteus muscles. The arterial supply is mainly through the genicular branches of the popliteal artery, femoral artery, and anterior tibial artery. Nerves associated with the knee joint are the femoral, tibial, common peroneal, and obturator nerves. Important anatomical structures at the site of the elbow joint are the ulnar collateral ligament, radial collateral ligament, annular ligament, and olecranon bursa. Muscles associated with the elbow joint include biceps brachii, triceps brachii, brachialis, and brachioradialis muscles. The arterial supply is mainly through the brachial artery, radial artery, and ulnar artery. Nerves related to the elbow joint are the median, radial, musculocutaneous, and ulnar nerves. At the site of the wrist joint are the triangular fibrocartilage complex, radiocarpal ligaments, ulnar collateral ligament, and flexor retinaculum. Associated bursae and synovial sheaths facilitate smooth tendon movements around the wrist joint. Muscles related to the wrist joint include flexor carpi radialis, flexor carpi ulnaris, extensor carpi radialis, and extensor carpi ulnaris muscles. The arterial supply is mainly through the radial artery, ulnar artery, and anterior interosseous artery. Nerves associated with the wrist joint are the median, ulnar, and radial nerves.

Thus, Asthi Sanghata should be understood as a comprehensive anatomical and functional unit involving bones, joints, ligaments, muscles, tendons, vascular structures, and Marma points.

These are structurally and functionally important regions responsible for stability, movement, and protection of the body. The stability and proper functioning of these Asthi Sanghatas are maintained by associated anatomical structures such as ligaments, muscles, tendons, aponeuroses.

The presence of important *Marma* points around Asthi Sanghatas further highlights their clinical significance. These joints are also common sites for traumatic injuries, degenerative disorders, ligament tears, dislocations, arthritis, and inflammatory conditions.

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CONCLUSION

After studying the description of asthi sanghata, we can conclude that these joints are major weight bearing and stability providing joints of the body. According to modern science these are mainly compound/complex type of synovial joints. The Ayurvedic description reflects an advanced understanding of musculoskeletal organization and joint stability, which closely correlates with modern anatomical.

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