



INTERNATIONAL JOURNAL OF
MULTIDISCIPLINARY HEALTH SCIENCES
ISSN: 2394 9406

“ASTHI DHATU– A LITERARY REVIEW”

Dr. Pradnya Rokade¹, Dr. Dipali Patil²

¹Associate Professor, Dept. of Rachana Sharir,

²Associate Professor, Dept. of Kriya Sharir,

L.R.P. Ayurvedic Medical College, Hospital, P.G. Institute and Research Centre, Islampur,
Tal: Walwa, Dist: Sangli.

Corresponding Author's Mail ID: drpradnyawagh@gmail.com

ABSTRACT:

Bones are hard tissues which form the bulk of the anatomical structure of an individual. It is on the support of the bony skeletal frame that exists, stand, sit, move and do all the activities. According to modern science bones are 206 in number and are present in various shapes, sizes, long, short, flat and many others. According to *Ayurveda*, bones are 360 in number. It is not a huge numerical difference between the number of bones mentioned by *Ayurveda* and modern anatomical science; it is all about how these two different sciences looked at the anatomy of the body and the arrangement of bones from their view point. The present article reviews the *Asthi Dhatu* described in *Ayurveda* with the anatomical view.

Key words- *Asthi, Dhatu, Bone, Anatomy.*

INTRODUCTION:

Ayurveda has contributed immensely towards the science of anatomy. *Ayurveda* laid the foundation of anatomical concepts around which the modern day anatomy has evolved.

Formation of bone starts in the 2nd month of intrauterine life. *Asthi* is a substance which remains even after else very part like flesh, muscles, etc. are shattered, even after burying the body after death. It remains as last identity of person even after demise.

AIMS AND OBJECTIVES:

1. To study the concept of *AsthiDhatu* discussed in *Ayurveda* with reference to osseous tissue.
2. To study the concept of *Dhatu* discussed in *Ayurveda*.
3. To study the concept of bones as per modern literature of anatomy.

MATERIAL AND METHODS:

All available literature for the conceptual study of *Dhatu*, *AsthiDhatu* and concept of osseous tissue in various forms like textbooks, handbooks, magazines, original research articles, search engines like Google, academic research databases like PubMed, Google scholar etc.

AsthiDhatu- It is one among the *Sapta Dhatus* which are present in the *Sharira*. Form of *Dhatu* which is present inside the *Mamsa Dhatu* is known as *Asthi*.¹

Panchabhautika Constitution-

Though every substance is made of all five *Mahabhutas* (*Akasha*, *Vayu*, *Agni*,

Jala and *Prithivi*), but *Asthi* has predominance of *Prithivi* and *VayuMahabhuta*. *Asthi* has predominance of *Prithivi* and *Vayu* Mahabhuta, *AsthiDhatu* thus comprises qualities of these two dominantly. As per qualities of *PrithiviMahabhuta*, *Asthi* is strong and heavy and as per qualities of *VayuMahabhuta*, *Asthi* is dry and rough. Thus, both these *Mahabhuta* give characteristic qualities like toughness, roughness, dryness and hardness².

AsthiUtpatti and Poshana- According to *AcharyaCharak*³ in *ChikitsaSthana*, after *Rasa Rakta* is formed. From *Rakta Mamsa* is formed, from *Mamsa Meda* is formed, from *Meda Asthi* is formed, from *Asthi, Majja* is formed and from *Majja, Shukra Dhatu* is formed, which when gets adequate conditions develops into *Garbha*. *Chakrapani* details it as follows- For first three *Dhatu-Rasa* after being digested by *Rasagni* gets converted into *Rakta* and like this *Rakta* digested with its *Raktaagni* gets converted into *Mamsa*. Like this all *Dhatu* gets converted into next coming *Dhatu*. Like as *Dugdha* to *Dahi*, *Dahi* to *Navneeta*, *Navneeta* to *Ghrita* and from *Ghrita* to *Grhtamanda* get converted step wise, same is concept for *Dhatu* formation.

Relation between *Vata Dosha* and *Asthi Dhatu-*

According to the classics, Asthi is the seat of Vata and Asthi acts as Ashraya and Vata acts as Ashrayee. Even though the basic rule is that the materials which cause increase of Ashraya should also affect the increase of Ashrayee and materials that cause decrease of Ashraya cause decrease of Ashrayee, the reverse is true in the case of Vata and Asthi. A material which causes increase of Asthi will produce decrease of Vata and vice versa.

AsthidharaKala⁴-

Purisha –dhara-kala is the 5th Kala which exists in large intestine i.e. *Pakvashaya*. Functionally it separates constituents of *Kitta* or waste products in colon. *Vayu* which is produced in *Pakvashaya* (as *AnnaMala*) is *PoshakaVayu*, which nourishes *PoshyaVayu* of body. As *Pakvashaya* and *Asthi*, both are main seats of *VataDosha*. Therefore, increased or decreased formation of *Vata* and *Purisha* affects all sites of *Vata*, especially *AsthiDhatu*. Hence *Purisha-DharaKala* is also called as *Asthi-DharaKala*.

Asthi Karmas-

Asthi supports the body (*Deha Dharana*), It nourishes *majjadhatu* (*Majja Pushti*), It provides support to muscles (*MamsaDhatu*) and It provides support to blood vessels (*Sira*) and tendons (*Snayu*)^{5,6}.

AsthiUpadhatu- The *Upadhatu* of *Asthi* is *Danta* (teeths.)

AsthiMalas- During the formation of any *Dhatu* it will produce their own *Malas*. Similarly

Asthi also has *Malas*, as *Nakha* and *Roma*.

AsthiSankhya-

The distributions of Asthi in the Shadanga of Sharira are as follows-

According to *SushrutaSamhita*

Shaakha : 140

•*Shroni, Parshva, Prushtha, Uras*: 117

•*Greevordhva*: 63

According to *AshtangaSangraha*

•*Shaakha* :140

•*Madhya Sharira*:120

•*UrdhvaSharira*: 100

Asthisankhya According to different authors-

CharakaSamhita -360

Sushruta Samhita-300

Ashtanga Sangraha-360

Bhavaprakasha -300

AsthiBhedas (Types) - Depending upon size, shape, position of *Asthi* in the body total

Asthi is divided into five types.

Types of Asthi-

➤ **Kapalasthi⁷** - These are flat in nature. Literally it means bone which covers and protects the brain.

➤ **Valayasthi⁸**- These are round in shape or particularly hemi circle in shape.

- **Tarunasthi⁹**- These are soft in nature. Literally it means which have either not fully developed i.e. ossified. Also the bones of child have come under same scenario.
- **Nalikasthi¹⁰** - These are long like tubes and hollow from within. They are reed shaped.
- **Ruchakasthi¹¹** -The bones which are different from all and are utilized to chew food and enjoy the taste. These are for taste sensation

The locations of each type

1. **Kapala-** *Asthis* present in the *Janu, Nitamba, Amsa, Ganda, Talu, Shankha, Vankshana* And *Madhyashira* are known as *KapalaAsthi*
2. **Valaya-** *Asth* in *Pani, Pada, Uru, Parshva* and *Prustha* are *Valayasthi*. Some commentators don't agree with it as they count some other bones in this category as *Pada, Hasta, Griva* and *Prishsta*.
3. **Taruna-** *Asthis* present in the *Ghrana, Karna, Greeva* and *Akshikuta* are called as *Tarunasthi* Bhoja also added *Kantha* in list.
4. **Nalaka-** *Asthis* which are left from above description is listed in this type. Commentators like *Dalhana* and *Bhoja* have specified some of bones like *HastaAnguli, PadaAnguli, PadaTala,*

Kurcha, BahuAsthi, JanghaAsthi etc in examples of this type.

5. **Ruchaka-** The *Dashanas* are known as *Ruchakasthi*. These are 28 or 32 in all. So, here *Ruchaka* i.e. *Danta* (teeth) are also regarded as *Asthi* along with various other stiff parts.

Asthivaha Srotas-

Channels of circulation or tracts within the body are called *Srotas*. They are named so because of their tendency of trickling or oozing of secretions through them. They are the pathways (*Ayana*) for the nutrient products; waste-products and *Doshas* during the process of metabolism. *Srotas* enable their products to reach their destination (viz. assimilation of nutrient substances by different parts of the body, or elimination of waste products from the body). They transport the *Dhatus* which are undergoing transformation. *Srotas* are entity which carries onward the converted products from *Prokopa* and *ShamakAahar* in human body so is the definition and function of *AsthivahaSrotas*.

Asthivaha Srotas finds its identity only in *Charaka, Vagbhata* but its description is missing from *Susruta's* text. As per *Charaka* its *MoolaSthana, DustiKarana* and *Dusti laksanas* are described. Exclusion of *AsthiVahaSrotas* from *Susruta's* list is due to his surgeon's

vision upon anatomical structures described as *MoolaSthana* that's why he described *MoolaViddhaLakshanam* in reference to injury.

AsthivahaSrotasDustikarana - Excessive exercise, excessive stretching, trauma or excessive *Vata-Dosha-Pradhan-Aahar* and *Vihar* can cause *AsthivahaSrotasDusti*.

AsthivahaSrotasDustiLakshana - These includes *Adhyaasthi*, *Abhidanta*, *Dantabheda*, *Dantshoola*, *Asthibheda*, *Asthishoola*, *Asthi Vivaranta* , *Danta Vivaranta*, diseases of hair, nails and beard.

ASTHI MARMA:

In *Adhyaya* six of *Susruta Samhita* description of *Marma* is given in very detail. Total number of *Marmas* is 107 which are uniform in all *Samhitas*. *Sushruta* clearly indicates that a surgeon should be careful enough during operation of any patient to avoid these vital points. Total no of *Marmas* according to anatomical matrix are divided in 5 categories:

- a) *Mansa Marma*- 11
- b) *Sira Marma*- 41
- c) *Snayu Marma*- 27
- d) *Asthi Marma* -8
- e) *Sandhi Marma* -20

AsthiMarma includes, *Katikataruna*, *Nitamba*, *Amsaphalaka* and *Sankha*.

Katikataruna - This is situated in back. *Kati* means waist and *Taruna* means Cartilagenous

•Number- 2

•Type- *Pristha*, *Asthi* and *KalantarapranaharaMarma*

•Size- Half- finger breadth.

•Location- *Marma* is near upper margin or pelvic bone (few centimeters from lumbo-sacral joints).

•Anatomy – Sacroiliac joint each side the underlying structures are –iliac bone iliac artery and sacroiliac joint and ligaments.

•On injury-Hemorrhage and death.

Nitamba - This Marma refers sciatic nerve cord before entering the femoral region.

•Type- *Pristha*, *Asthi* and *Kalantarapranahara Marma*.

•Size- Half- finger breadth.

•Location- Above pelvic crest, pelvis and both united flanks are together known as *Nitamba Marma*.

•Anatomy- The *Marma* lies on half the distance between sacral bone and femoral greater trochanter.

•On injury- Edema and Weakness on legs.

Amsaphalaka-This refers to scapular blade.

•Types-*Pristha*, *Asthi* and *Vaikalyakara Marma*.

•Size- Half-finger breadth.

- Location-Upper medial edge of scapular blade.
 - Anatomy – This area is very important as nerve and vascular supply under it, like thoraco-cervical nerve fibers supplying the scapular muscles and reaches brachial plexus.
 - On injury-Disfigurement of upper limb
- Sankha-** This refers to anatomical temporal bone.
- Types- *Sira, Asthi, Sadyah Pranahara Marma*
 - Site- It is in between parietal, frontal and maxillary portion of skull.
 - Anatomy- Underneath this lays a temporal lobe of cortex arterial branches.
 - Location- Above the end of eyebrow and between ear and forehead.
 - Size- Half -finger breadth.
 - On injury- Death

ASTHI PRADOSHAJA VIKARAS

Dalhana mentioned the reason behind explaining the *Dhatu Pradosaja Vikara* separately, these are- *Chikitsa Vishesa Vijnanartha* and *Sukhasadhyatvadi Karma Bodhartham*.

The *Asthi Pradoshaja Vikaras* which are mentioned in different classics are *Vyadhi– Adhyasthi, Adhidanta, Dantabheda, Dantashoola, Asthibheda, Asthishoola, Vivarnata, Kesa,*

Loma, Nakha, SmashruDosh, Kunakha and *AsthiToda*. *Yogendranath Sen* in commentary of *Charaka Samhita* mentioned that *Kesha, Loma* and *Smashru* are *Malas* of the *Asthi Dhatu*. This is the reason to consider *Keshadi Doshas* as one among the *Asthi PradoshajaVikaras*.

EFFECT OF TRAUMA ON BONES

The bones sustain trauma in different ways. *Acharya Susruta* has paid due attention to this fact and observed that all the bones do not show similar type of effect due to trauma.

1. *Tarunasthi* (Cartilage) – Bend
2. *Nalkasthi* (Long bones) –Break
3. *Kapalasthi* (Flat bones) – Crack
4. *Ruchkasthi* (Teeth) – Fragmented
5. *Valayasthi* (Curved bones) - Crack or Break

DISCUSSION AND CONCLUSION:

Asthi refers to bone. Bone gives the solid appearance to the body. In *Ayurveda*, *Dhatuis* referred to tissue. These seven *Dhatuis* are *Rasa, Rakta, Mamsa, Meda, Asthi, Majja, Shukra*. From anatomical point of view they can be understood as Plasma, Blood, Muscle, Fat or adipose tissue, bone, bone marrow and seminal fluid.

Basic understanding of *Dhatuis* is vital to understand the underlying pathology of the

disease. These seven *Dhatus* are chiefly responsible for pathogenesis of any disease in the body and also responsible for immunity of the body. These *Saptadhatus* are also composed of *Panchmahabhootas*. Any imbalance in the equilibrium of any *Dhatu* can lead to specific Disease. For example in context of *AsthiDhatu*, when *Asthi Dhatu Kshaya* occurs *Vedana Lakshana* aggravates, in modern science it is understood as Osteoarthritis.

The *Asthi Dhatu* is subsequent to the *Meda Dhatu*. The *Dhatu* is understood here by means of all available literature and the knowledge regarding the *Asthi Dhatu* is very useful while considering the bones in anatomy. The understanding of the concept of *Asthi Dhatu* is useful for treating the *Asthi Dhatu* disorders and their clinical manifestations.

REFERENCES:

1. *SushrutaSamhita* with commentary *Nibandhasangraha* by *Dalhana*, published by *ChaukhambhaOrientalia*, Varanasi , *SutraSthana*, Chapter 15/8.
2. *Charaka Samhita* by *Charaka* and *Dridbala* with commentary by *Chakrapani* , published by *Chaukhambha Sanskrit Sansthan* Varanasi. *ChikitsaSthana* Chapter 15/16.
3. *Charaka Samhita* by *Charaka* and *Dridbala* with commentary by *Chakrapani* , published by *Chaukhambha Sanskrit Sansthan* Varanasi. *ChikitsaSthana* chapter 15/27
4. *SushrutaSamhita* with commentary *Nibandhasangraha* by *Dalhana*, published by *ChaukhambhaOrientalia*, Varanasi , *KalpaSthana* chapter 4/40.
5. *SushrutaSamhita* with commentary *Nibandhasangraha* by *Dalhana*, published by *ChaukhambhaOrientalia*, Varanasi , *SutraSthana* 15/4
6. *SushrutaSamhita* with commentary *Nibandhasangraha* by *Dalhana*, published by *ChaukhambhaOrientalia*, Varanasi , *ShareeraSthana*, 5/28
7. *Shabdakalpadruma* by *Raja Radhakanta Dev*, published by *Chaukhambha Sanskrit Sansthan*, Varanasi.
8. *Shabdakalpadruma* by *Raja Radhakanta Dev*, published by *Chaukhambha Sanskrit Sansthan*, Varanasi.
9. *Shabdakalpadruma* by *Raja Radhakanta Dev*, published by *Chaukhambha Sanskrit Sansthan*, Varanasi.
10. *Shabdakalpadruma* by *Raja Radhakanta Dev*, published by *Chaukhambha Sanskrit Sansthan*, Varanasi.
11. *Shabdakalpadruma* by *Raja Radhakanta Dev*, published by *Chaukhambha Sanskrit Sansthan*, Varanasi.