

A REVIEW ON *ASTHI DHATU*

Dr. Noopur Singh Solanki¹ Dr. Dharmendra Choudhary²

1. PG Scholar 2nd Year, Department of Sharir Rachana, NIA, Jaipur.
2. PG Scholar 2nd Year, Department of Sharir Rachana, NIA, Jaipur

Abstract

The body is believed to be composed of seven types of tissues called as *Sapta Dhatu*. These seven tissues work in coordination with each for proper physiological functioning of human body. *Asthi* is one among the seven *Dhatu* which are described in *Ayurveda*. In this article we are trying to collect the all general information of *Asthi Dhatu* defined in different texts from its formation to nutrition, number, nature, distribution, character, its importance in the journey of life and effects on body when it deviates from its normal character or number like *Asthi Kshaya* and *Asthi Vriddhi*. Some other factors which are related to *Asthi Dhatu* are also included like *Asthidhara Kala* and *Asthivaha Srotas*.

Key words: *Asthi Dhatu*, *Asthi Kshaya*, *Asthidhara Kala*, *Asthivaha Srotas*, *Asthi Vriddhi*,

Introduction:

Ayurveda is a holistic science for the prosperity of society. The main aim of *Ayurveda* is to maintain the good health of human being. Keeping this in mind, it is important to be clear about the concept of *Sharir* and its components. *Sharir Sthana* is described in all major *Samhita*. The main content of *Sharir Sthana* is the anatomy of various structures and their importance. *Dhatu* are the tissue-humoral systems of the body. They are always formed in a fixed sequence. In different permutations and combinations the *Dhatu* form various physical organs of the body according to the genetically coded information's. *Asthi* is one among the seven *Dhatu* which are described in *Ayurveda*.¹ It is defined as long lasting component of the body. *Asthi* is the most essence part of the body as important as the annual rings for a huge tree by binding all the branches to it.²

Concept of *Asthi Dhatu*:

Generally bones are considered as *Asthi*. There are two types of *Dhatu*, i.e. *Sthayi* and *Poshaka Dhatu Asthi* or bone can be considered as *Sthayi Dhatu* and not the whole *Asthi Dhatu*. *Asthi Dhatu* is also in liquid form called as *Poshaka Asthi* that flows through the *Asthivaha Srotas* and nourishes the *Sthayi Asthi Dhatu*.³ According to recent advances, the osseous tissue can be taken as the *Sthayi Asthi Dhatu* and the nutrients that are responsible for the nourishment of the bone tissue such as calcium, phosphorus, magnesium etc can be considered as the *Poshaka Asthi Dhatu*.⁴

Origin of *Asthi Dhatu*:

Each *Dhatu* is developed from the layer of previous tissue, starting from the *Rasa* (fluid) *Dhatu*. Every *Dhatu* act as a precursor of the next *Dhatu*. *Asthi Dhatu* is formed by *Meda Dhatu* in the sequence of *Dhatu Nirman*.⁵ *Meda Dhatu* becomes *Khar* (hard/rough) with the combination of *Prithvi* and *Vayu Mahabhoot* and its own *Dhatwagni*. That *Khar* part is called as *Asthi*.

1.	<i>Panchbhautikatva Of Asthi</i>	<i>Prithvi And Vayu</i> ⁶
2.	<i>Updhatu Of Asthi</i>	<i>Dant</i> ⁷
3.	<i>Mala Of Asthi</i>	<i>Kesh,Loma</i> ⁸ <i>Kesh Loma Nakha</i> ⁹
4.	<i>Guna Of Asthi</i>	<i>Guru, Khara, Kathin, Sthula, Sthira Murtimada</i> ¹⁰
5.	<i>Karma Of Asthi</i>	<i>Deh Dharan, Majja Pushti</i> ¹¹

Asthi Sankhya:

Number of bones are variant in *Brihatrayee*.

S.N	Name Of Samhita	No. Of bones	Shakha	Madhya Sharir	Koshth
1.	<i>Carak Samhita</i> ¹²	360	128	140	92
2.	<i>Shushrut Samhita</i> ¹³	300	120	117	63
3.	<i>Astang Hridaya</i> ¹⁴	360	140	120	100

Distribution of Asthi in body:

Following the principal of “*Sharire ShushrutShreshthah*” distribution of *Asthi* is given in the table below according to *Sushrut Samhita*.¹⁵

Shakha- 120	Madhya Sharir-117	Urdhava Jatrugata-63
3 in each <i>Padanguli</i> =15	<i>Shroni</i> -5	<i>Griva</i> -9
<i>Padatala, Padakurcha, Gulpha</i> =10	<i>Parshva</i> -36 (total 72)	<i>Dant</i> -32
	<i>Prishtha</i> -30	<i>Talu</i> -1
<i>Parshni</i> =1	<i>Uras</i> -8	<i>Hanu</i> -2
<i>Jangha</i> =2	<i>Amsa Phalak</i> -2	<i>Nasa</i> -3
<i>Janu</i> =1	Total=117	<i>Kanthanadi</i> -4
<i>Uru</i> =1		<i>Siras</i> -6
Total= 30 in each <i>Shakha</i>		<i>Ganda, Karna, Sankha</i> - 1 in each (total-6)
		Total-63

Types of Asthi:¹⁶

Depending upon size, shape, position of *Asthi* in the body total *Asthi* is divided into five types.

- 1) **Kapala**- *Asthi* present in the *Janu, Nitamba, Amsa, Ganda, Talu, Shankha, Vankshana* and *Madhyashira* are known as *Kapala Asthi*.
- 2) **Valaya**- *Asthi* in *Pani, Pada, Uru, Parshva* and *Prustha* are *Valay Asthi*.

3) **Taruna**- *Asthi* present in the *Ghrana*, *Karna*, *Griva* and *Akshikuta* are called as *Tarun Asthi*.

4) **Nalaka**- *Asthi* which are left from above description is listed in this type. Commentators like *Dalhana* and *Bhoja* have specified some of bones like *Hasta Anguli*, *Pada Anguli*, *Pada Tala*, *Kurcha*, *Bahu Asthi*, *Jangha*, *Asthi* etc in examples of this type. Typically bones of extremities are *Nalaka Asthi*.

5) **Ruchaka**- The *Dashana* are known as *Ruchak Asthi*.

Kshaya and Vriddhi of Asthi Dhatu:

The *Kayagni* present in *Amashaya*, has portion of itself present in the *Dhatu* also. Their decrease and increase give rise to increase and decrease of the *Dhatu*. The preceding *Dhatu* which is either increased or decreased give rise to the succeeding *Dhatu* of same condition.¹⁷ Hence to summarize, when anabolic function of *Asthi Dhatwagni* becomes *Manda* and catabolic function becomes *Tikshna*, *Asthi Vyaya* (bone resorption) overpowers *Asthi Utpatti* (bone formation) leading to *Asthikshaya* (Osteoporosis).¹⁸

Asthidhara Kala:¹⁹

Purishadhara 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 *Anna Mala*) is *Poshaka Vayu*, which nourishes *Poshya Vayu* of body. As we know that *Pakvashaya* and *Asthi*, both are main seats of *Vata Dosha*. Therefore, increased or decreased formation of *Vata* and *Purisha* affects all sites of *Vata*, especially *Asthi Dhatu*. Hence *Purishadhara Kala* is also called as *Asthidhara Kala*.

Asthivaha Srotas:

Though development of *Asthivaha Srotas* has not been described separately, yet *Susruta* describes it in description of *Medodhara Kala*. Here *Susrutha* tells that *Medodhara Kala* is present in *Udar* (abdomen), *Anuasthi* (short bones) and *Majja* in *Mahat Asthi* (long bones).²⁰ *Asthivaha Srotas* description is found in *Charaka*, *Vagbhatta* but missing from *Susruta*'s text. The *Asthivaha Sroto Moola* are *Medo Dhatu*, *Jaghana* and *Asthi Sandhi*.²¹ Excessive exercise, excessive stretching, trauma or excessive *Vata Dosha Pradhan Aahar* and *Vihar* can cause *Asthivaha Srotas Dusti*.²² These include *Adhyaasthi*, *Abhidanta*, *Dantabheda*, *Dantashoola*, *Asthibheda*, *Asthischoola*, *Asthi Vivaranta*, *Danta Vivaranta*, diseases of hair, nails and beard.²³

Asthisaar Purusha:

Asthisaar Purusha has prominent ankles, knees, elbows, clavicles, chin, head, nails and teeth. Such persons are very enthusiastic, active and enduring. They also have strong and firm body and live well.²⁴

Ashraya Ashrayi Bhava of Asthi:

Vata resides in *Asthi* (bones); *Pitta* resides in *Rakta* (blood) and *Sweda* (sweat); *Kapha* resides in rest of the *Dhatu*s (tissues) and *Mala* (waste products). In case of *Pitta* and *Kapha*, when there is an increase of *Pitta* or *Kapha*, there is also a corresponding increase of tissues and waste products associated with them. For example, if *Pitta* increases, then sweat and blood also increase. The same rule applies to decrease as well. But in case of *Vata* and *Asthi* it is exactly opposite: if *Vata* increases, then *Asthi* decreases and vice versa. They are inversely related to each other.²⁵ This relationship helps in knowing both the *Hetu* (cause) and *Chikitsa* (treatment) of a *Vyadhi* (disease) as nourishment of *Asraya* and *Asrayi* is similar. The *Ahara*, *Vihara* or *Aushadha* that increase or decrease the *Dosha* will increase or decrease the corresponding *Asraya*

(*Dhatu* and *Mala*). As we have said above, however, the above mentioned rule is not applicable to *Asthi Dhatu* and *Vata Dosha*.

Discussion:

As the toy is made up of straws and threads and pasted with the wet clay from outside, similarly *Snayu* (ligaments) are tied with *Asthi* (bones) in body. Ligaments are covered by *Mamsa* (muscles) which are nourished continuously by the *Dhamani* and *Sira* (vessels) and then whole body is covered by *Twacha* (skin). This indicates that *Asthi* is meant for playing anchor role of frame work of body and is supported effectively by *Snayu*, *Mamsa*, *Dhamani* and *Sira*.²⁶

Conclusion:

According to *Susruta* “*Asthi* is substance which destroys at last when body perishes” whereas in modern science it is simply defined as hard connective tissue and characterized by the presence of Haversian system helping in its nourishment. Thus, a major difference arises as per definition so is the differences are seen in enumeration, types and function. As the *Astanga Samgraha* declares “*Shareeram dharayenthe dhatvasharashcha sarvada*” meaning the support of the human body is nourishes by entirely *Dhatu* and *Ahara*. Among the *Sapta Dhatu*, the *Ashti Dhatu* is the one which is bestowed with the supreme function of *Shareera Dharana* (bodily support). *Asthi dhatu* confers structure to the body and protects the vital organs. A human being without *Asthi Dhatu* would be a formless blob of soft tissues. Thus, *Asthi dhatu* can accurately be viewed as the scaffolding by which humankind stands upright and noble. Any discord in the equilibrium of the *Dosha* and *Dhatu* leads to disease. Knowledge of enumeration of *Asthi* of human body is important in clinical practice as it is prime source of evidence.

References:

1. Vagbhatt, Kaviraj Atridev Gupta, Ashtang Hridayam Vidyotini Hindi Commentary, Reprint. Varanasi: Choukhambha Prakashan, 2012, Sutra Sthana Chapter 1/13, pg 8
2. Sushutra, Ambika Dutta Shastri, Sushutra Samhita with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Reprint. Varanasi: Choukhambha Sanskrit Sansthan, Sharir Sthan 5/23, 2011; pg60.
3. Chakrapani on Agnivesha - Charaka samhita, revised by Charaka & Dhridabala, with Ayurveda Dipika commentary by Cakrapanidatta, edited by Vaidya Yadavaji Trikamji Acarya, Chaukhambha Sanskrit Sansthan, Varanasi, 5th edition, 2001. Vimana sthana, 5/8.
4. Bhat Madhavilata, Concept of Dhatu and Dhatwagni w.s.r to Asthi Dhatu and Asthyagni, M.D.(Ayu) thesis, G.A.U, Jamnagar, 1995.)
5. Charaka Samhita with Vidyotini hindi commentary by Pt. Kashinath Shastri & Dr. Gorakhanatha Chaturvedi, Part-1&2, Published by Chaukhambha Bharti Academy Varanasi, 22nd Edition 1996, Chikitsa Sthana 15/16, pg 456.
6. Bhavprakash, Bhav Mishra 5th ed. Vidyotini Commentary by Brahma Shankar Shastri, Chaukhamba Sanskrit Series, Varanasi, 1969.
7. Sharangadhara Samhita of Sharngadhar edited with Jiwanprada Hindi Commentary by Dr. Smt. Shailaja Srivastava, Chaukhambha Orientalia Varanasi, 2nd Edition 1998.
8. Charaka Samhita with Vidyotini hindi commentary by Pt. Kashinath Shastri & Dr. Gorakhanatha Chaturvedi, Part-1&2, Published by Chaukhambha Bharti Academy Varanasi, 22nd Edition 1996, Chikitsa Sthana 15/19, pg 456.

9. Sharangadhara Samhita of Sharngadhar edited with Jiwanprada hindi Commentary by Dr. Smt. Shailaja Srivastava, Chaukhambha Orientalia Varanasi, 2nd Edition 1998.
10. Ashtanga Samgraha of Vagabhatta edited by Pandit Lalchandra Shastri Vaidya, Shri Vaidyanath Ayurveda Bhawan, Nagpur, 1st edition, 1989.
11. Sushutra, Ambika Dutta Shastri, Sushutra Samhita with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Reprint. Varanasi: Choukhambha Sanskrit Sansthan, Sutra Sthan 15/7, 2011; pg75.
12. Charaka Samhita with Vidyotini Hindi commentary by Pt. Kashinath Shastri & Dr. Gorakhanatha Chaturvedi, Part-1&2, Published by Chaukhambha Bharti Academy Varanasi, 22nd Edition 1996.
13. Sushutra, Ambika Dutta Shastri, Sushutra Samhita with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Reprint. Varanasi: Choukhambha Sanskrit Sansthan, Sharir Sthan.
14. Vagbhatt, Kaviraj Atridev Gupt, Ashtang Hridayam Vidyotini Hindi Commentary, Reprint. Varanasi: Choukhambha Prakashan,2012.
15. Sushutra, Ambika Dutta Shastri, Sushutra Samhita with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Reprint. Varanasi: Choukhambha Sanskrit Sansthan, Sharir Sthan.
16. Sushutra, Ambika Dutta Shastri, Sushutra Samhita with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Reprint. Varanasi: Choukhambha Sanskrit Sansthan, Sharir Sthan.
17. Vagbhatt, Kaviraj Atridev Gupt, Ashtang Hridayam Vidyotini Hindi Commentary, Reprint. Varanasi: Choukhambha Prakashan,2012, Sutr Sthana 11/34,pg 118.
18. Vagbhatt, Kaviraj Atridev Gupt, Ashtang Hridayam Vidyotini Hindi Commentary, Reprint. Varanasi: Choukhambha Prakashan,2012, Sutra Sthana 11/29, pg 117.
19. Sushutra, Ambika Dutta Shastri, Sushutra Samhita with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Reprint. Varanasi: Choukhambha Sanskrit Sansthan, Kalp Sthana.
20. Sushutra, Ambika Dutta Shastri, Sushutra Samhita with Elaborated Ayurveda Tatva Sandipika Hindi Commentary, Reprint. Varanasi: Choukhambha Sanskrit Sansthan, Sharir Sthana.
21. Charaka Samhita with Vidyotini Hindi commentary by Pt. Kashinath Shastri & Dr. Gorakhanatha Chaturvedi, Part-1&2, Published by Chaukhambha Bharti Academy Varanasi, 22nd Edition 1996.
22. Charaka Samhita with Vidyotini Hindi commentary by Pt. Kashinath Shastri & Dr. Gorakhanatha Chaturvedi, Part-1&2, Published by Chaukhambha Bharti Academy Varanasi, 22nd Edition 1996.
23. Charaka Samhita with Vidyotini Hindi commentary by Pt. Kashinath Shastri & Dr. Gorakhanatha Chaturvedi, Part-1&2, Published by Chaukhambha Bharti Academy Varanasi, 22nd Edition 1996.
24. Charaka Samhita with Vidyotini Hindi commentary by Pt. Kashinath Shastri & Dr. Gorakhanatha Chaturvedi, Part-1&2, Published by Chaukhambha Bharti Academy Varanasi, 22nd Edition 1996.
25. Vagbhatt, Kaviraj Atridev Gupt, Ashtang Hridayam Vidyotini Hindi Commentary, Reprint. Varanasi: Choukhambha Prakashan,2012,Sutra Sthana 11/29, pg 117.
26. *Kashyapa Sahnhita of Vriddha Jivaka* revised by Vatsya with Sanskrit Intoducation by Pandit Hemaraja Sharma, Chaukhamba Sanskrit Series, 2002.