



HUMAN ANATOMY ACCORDING TO AYURVEDA AND THEIR DISORDER'S

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ABSTRACT “Dosa dhatu mala mulam hi sariram.” With this concise sloka from the Caraka Samhita (c. 200 BC), Ayurveda reveals the healthy human body as the dynamically balanced state of dosha, dhatu and mala (bioenergies, tissues and wastes). This same point is further elaborated on by Acharya Sushruta a century later with his famous definition of health as “the equilibrium of dosha, dhatu, mala, agni, kriya and prasanna (serenity, clarity) of atma, indriya and manas”. As the Astanga Samgraha (c. 500 AD) further declares: “Shareeram dharayenthe dhatvahascha sarvada” meaning the support of the human body is accomplished by entirely dhatu and ahara (tissues and food). Among the sapta dhatus (seven tissues), the asthi dhatu (bone tissue) 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 doshas and dhatus leads to disease.

KEYWORDS : Asthi Kshaya, Osteoarthritis, Bone Density.

AYURVEDA DEFINITION OF ASTHI DHATU (BONES OR SKELETAL SYSTEM)

According to texts of ayurveda asthis or bones are formed from the nutrients supplied by medha dhatu through asthivaha srothas. The nutrients in medha dhatu which is meant to nourish asthi dhatu are processed in asthivaha srothas by dhatwagnis. Dhatwagni and bhutagni (vayu, agneya and prithvi) bring about hardness and heaviness to these nutrients which form asthi or bone.

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 we exist, stand, sit, move and do all the activities.

Bones are 206 in number and are present in various shapes and sizes, long, short, flat and many others. They fit aptly into the plan of engineering of the body and have evolved a lot keeping in pace of the evolution of mankind.

According to Ayurveda, bones are 360 in number. It is not that there is a huge numerical difference between the number of bones mentioned by Ayurveda and modern anatomical science; it is about how these 2 different sciences looked at the anatomy of the body and the arrangement of bones from their view-points, millenniums apart!!

ASTHISHAAREERA

Asthi=bone, bones

Shaareera=study of body

Asthi Shaareera means the study of human body in terms of anatomy of bones or study of bony part of the body. In simple terms, it means anatomy of bones.

Asthi, Definition

अस्थते इति अस्थिः। (शब्द स्तोम निधि)

अस्थते+अस+क्थिन् मांस अभ्यन्तर अस्थे इति।

ASTHILASTS LONG

तस्मात् चिर विनष्टेषु त्वक् मांसेषु शरीरिणाम्।

अस्थीनि न विनश्यन्ति साराणि एतानि देहिनाम्॥ (सु.शा.५/२२)

Etymological definition – Asthi is that which lives within the mamsa (muscle).

Even practically we see that asthi or bones are enveloped by layers of mamsa (muscle).

Asthi is considered to be a Pitruja Avayava – or paternal organ or the part of the body derived from father (sperm). All hard structures are said to be Pitruja.

Asthi is predominantly made up of Prithvi (Earth) mahabhuta (element of our creation). The other elements of nature (wind, water, fire and space) are also present, but in a latent and recessive form.

Functionally Asthi is said to satisfy the function of 'Dharana' or adorning the body. It is obvious that the bones are structural make-up of the body.

Among the tridoshas (3 body humors or physiological / functional components), Vata is said to be seated in the bones or asthi. Asthi is one of the important seats of Vata. When Vata increases, the mass of asthi decreases (asthi kshaya), as in osteoporosis, osteopenia etc and when Vata pathologically decreases, the bone tissue tends to increase (asthi vridhhi).

Asthi marma – Certain bones are said to be Marmas or vital points of the body which when injured leads to sudden or gradual death or deformity of the body. Example: Amsaphalaka (scapular region), Shanka (temple bone) etc

Asthi is defined as a long lasting component of the body among all the tissues where as the twak (skin) etc structures degenerate earlier than the asthi.

Asthi Sankhya (Classification of bones)

एतानि पंच विधानि भवन्ति तद्यथा कपाल रुचक तरुण

बलय नलक संज्ञानि। (सु.शा.५)

ASTHISANKHYA (CLASSIFICATION OF BONES)

According to Ayurveda, the bones (asthi) are classified into 5 types. They are –

- Kapala Asthi – Flat bones
- Ruchaka Asthi – Teeth
- Taruna Asthi – Cartilages
- Valaya Asthi – Curved Bones
- Nalaka Asthi – Long bones

Kapala Asthi – The bones of shira (head), Shankha (temple region), kapala (cranial vault), talu (palate, upper part of the oral cavity, roof of mouth), amsa (scapula region, shoulder blade) and janu (knee) are classified under Kapala Asthi or flat bones.

Ruchaka Asthi – The teeth or danta are classified under Ruchaka Asthi (Ruchaka=taste)

Taruna Asthi – The cartilages found in the regions of akshiksha (orbital sac, pit of the eye, eye socket), sruti (auditory apparatus, ear canal), ghraana (olfactory region, nasal cavity or passages) and greeva (neck) are classified under Taruna asthi (taruna=immature,

unprocessed, young)

Nalaka Asthi – The long bones present in the hasta tala (plantar region or upper portion of hand), pada tala (plantar or lower portion of the foot), kurcha-manibandha (wrist joint), bahu (arms), anguli (fingers and toes), Jangha dwaya (both legs) etc are classified under Nalaka asthi

Valaya Asthi – Curved bones (apart from long bones) situated in the pani (hand), pada (foot), yuga (sides of the trunk, ribs), prushta (back, vertebrae), vaksha (chest, ribs), jathara (abdomen), payu (anal region, butt) are classified under Valaya asthis.

ASTHI SANKHYA (NUMBERS OF BONES)

Different authors have given different opinion regarding the number of bones. As said, it depends on how they visualized the anatomy of bones!!

Charaka and Vagbhata have opined that the bones are 360 in number. According to Sushruta they are 300 in number. According to Modern anatomy, bones are 206 in number.

Let us make a comparative study of numerology of bones as said by different teachers of Ayurveda as compared with the opinion of modern anatomy.

No	Name of the bone	Charaka-360	Vagbhata-360	Sushruta-300	Modern-206
1	Nakha (nails)	10	10	–	–
2	Padanguli (phalanges, toes)	30	30	30	28
3	PadaShalaka (metatarsals)	10	10	08	10
4	Padadhishtana (tarsals)	02	02	10 (Kurchasthi)	10 (tarsals)
5	Gulpha (ankle)	04	04+04 (Kurcha)	02	02 (Talus)
6	Parshni (calcaneum)	02	02	02	02
7	Antar janghasti (Tibia)	02	02	02	02
8	Bahihi Janghasti (Fibula)	02	02	02	02
9	Janu (Tibial tuberosity)	02	02	–	–
10	Janu Kapalika (Patella)	02	02	–	02
11	Uru nalaka (Femur)	02	02	02	02
12	Nakha Tala (Nail bed)	10	10	–	–
13	Hastanguli (metacarpals)	30	30	30	28
14	Hasta Shalaka Kurcha (Metacarpals)	10	10	08	10
15	Hastadhishtana (Distal Carpals)	02	02	10	08
16	Manika Tala Kurcha (Proximal Carpals)	02	06	04	08
17	Gulpha sthaanasthi (styloid processes)	–	04	–	–
18	Antaha Prakoshtasthi (ulna)	02	02	02	02
19	Bahihi Prakoshtasthi (Radius)	02	02	02	02
20	Bahu Nalaka (Humerus)	02	02	02	02
21	Kurparasthi (Elbow)	–	02	02	–
22	Shroni Palaka (Hip bone)	02	02	02	02
23	Bhagasthi (Pubis bone)	01	01	01	–
24	Trika (Sacrum)	–	01	01	01
25	Anutrika (Coccyx)	–	–	01	01
26	Prushta asthi (back bones)	45	30	30	05+12
27	Parshuka (Ribs)1	24	24	24	24
28	Parshukarbuda (TP of TV)2	24	24	24	–
29	Parshuka sthalaka3	24	24	24	–
30	Uro asthi4	14	08	08	01 (sternum)
31	Akshaka (clavicle)	02	02	–	02
32	Amsa (scapular region)	02	02	–	–
33	Amsaphalaka (Scapula)	02	02	02	02
34	Jatru (root of neck)	01	–	–	–
35	Greevasthi (Cervical vertebrae)5	15	13	09	07
36	Kantha Nadi (Throat bones)	–	04	04	01 (hyoid)
37	Hanvasthi (Maxillae and Mandible)	01	02	02	02+01
38	Hanumula Bandhana (Root of jaw)	02	–	–	–
39	Shiraha Kapala (Scalp bones)	04	06	06	06
40	Talu asthi (palate, lacrimal)	02	02	01	02palate + 02lacrimal
41	Shankasthi (Temporal bones)	02	02	02	02
42	Nasasthi (nasal bones)	01	03	03	02+02+01
43	Gandakuta	–	02	02	02
44	Lalata (forehead)	01	–	–	–
45	Karna asthi (ear ossicles)	–	02	02	06
46	Danta (teeth)	32	32	32	–
47	Danta Ulukhala (tooth sockets)	32	32	–	–
48	Jatrukasthi (tracheal cartilage)	–	01	–	–

DISORDER**Osteo Arthritis**

Osteoarthritis (degenerative joint disease or osteoarthrosis) is the most common form of arthritis, affecting millions of people around the world. Often called wear-and-tear arthritis, osteoarthritis occurs when the protective cartilage on the ends of bones wears down over time. It causes pain, swelling and reduced motion in your joints.

Osteoarthritis mostly affects cartilage, the hard but slippery tissue that covers the ends of bones where they meet to form a joint. Healthy cartilage allows bones to glide over one another. It also absorbs energy from the shock of physical movement. In osteoarthritis, the surface layer of cartilage breaks and wears away. This allows bones under the cartilage to rub together, causing pain, swelling, and loss of motion of the joint. Over time, the joint may lose its normal shape. Also, small deposits of bone—called osteophytes or bone spurs—may grow on the edges of the joint. Bits of bone or cartilage can break off and float inside the joint space. This causes more pain and damage.

SIGNS AND SYMPTOMS

Osteoarthritis symptoms often develop slowly and worsen over time.

Signs and symptoms of osteoarthritis include:

- Pain
- Tenderness
- Stiffness
- Loss of flexibility
- Grating sensation.
- Bone spurst

CAUSES

While there isn't any single known cause of osteoarthritis, there are several risk factors that should be considered. Knowing and controlling these risk factors can help you minimize the risk or even help postpone or prevent getting OA altogether. Having risk factors for OA doesn't mean everyone will definitely get it. No single risk factor is enough to cause OA; it is more likely that a combination of risk factors works together to cause the disease.

There are two distinct types of osteoarthritis –

- Primary
- Secondary

RISK FACTORS

Factors that increase your risk of osteoarthritis include:

- Older age – The risk of osteoarthritis increases with age.
- Sex – Women are more likely to develop osteoarthritis, though it isn't clear why.
- Bone deformities – Some people are born with malformed joints or defective cartilage, which can increase the risk of osteoarthritis.
- Joint injuries – Injuries, such as those that occur when playing sports or from an accident, may increase the risk of osteoarthritis.
- Obesity – Carrying more body weight places more stress on your weight-bearing joints, such as your knees.

DIAGNOSIS

Most often doctors detect OA based on the typical symptoms (described earlier) and on results of the physical exam.

X-rays are still the main diagnostic tool however arthroscopy, ultrasound, MRI, CT scan etc. are used specially for experimental studies and not recommended for routine clinical use.

AYURVEDA MANAGEMENT

Ayurveda is a holistic approach to healthcare with roots in ancient India. According to Ayurveda, Osteoarthritis occurs due to aggravation of *Vata* Dosh and is known as “*Sandhivata*” (sandhi=joint).

At CHARAKA, we provide very effective treatment for Sandhivata. Early diagnosis and treatment is the key to controlling Sandhivata-osteoarthritis. Panchakarma procedures require around 3 – 4 weeks depending on the joint involved and patient can expect significant benefit within this period.

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