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Anatomical study of *Trika Pradesha*

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ABSTRACT

Rachana Shaareera deals with study of the 'constructive aspect of the human body, their numbers, location and dimensions' which is important to study the holistic system of Indian medicine called Ayurveda. There are differences related with *Trika Pradesha*. The study is done under various headings of: Historical review consists of references pertaining to *Trika* in various ancient literatures of Vedic period, Samhita period and *Sangraha Kala* as the term is used in various context in *Puranas* and *Granthas*. *Trika* is also the name of a Sage. Ayurvedic review consists of references about *Trika* as regions, bone, various joints of 3 bone, site of disease, site of treatment and its importance. When we study the samhitas and there commentaries we can anatomically co-relate it with pelvic region. Hence an attempt is made to define *Trika Pradesha* from Historical, Ayurvedic and Modern view.

Key words: *Trika, Shroni, Parshva.*

INTRODUCTION

Ayurveda is one of the greatest sciences; evolution of Ayurveda is for the prosperity of human being, an Upanga (subsidiary) to the Atharvaveda. Ayurveda is a branch of Indian science dealing with medicine, herbalism, taxonomy, anatomy, surgery, alchemy and related topics. Traditional practice of Ayurveda in ancient India dates back. Literature is commonly written in Sanskrit using various hymns. A few preliminary observations regarding the technique of

the Ayurveda system of medicine are necessary to understand the air and scope of Application of Ayurveda correctly.

The *Shareera* is classified into *Shadangas*. *Shadangas* and *Pratyangas* are the first ever anatomical landmarks explained in medical science. The knowledge of these aspects has made -understanding anatomy an easy process.

Basic knowledge of Anatomy is needed to interpret the observations; it is in that we learn the terminologies. The first scientific and successful cultivators of the most important and essential of all the departments of medical knowledge is practical anatomy which is required for the Practical surgery as said in *Rik Samhita*.

The classical books, if approached in a spirit of fairness and enquiry, might reveal the marvellous achievements of the ancient science in the domain of medical science. This affords vast scope, varied material for comparison and renders material help in improving of one with the aid of the other. This will benefit the suffering human.

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Detail anatomy describing *Trika* is not specified, as the term is used in various context. So, to determine the *Trika Pradesha*, the study has been taken on modern grounds.

The utter futility of attempt to explain a fact by the light of votive medal, to make the darkness visible and the confusion more confounded.

AIMS AND OBJECTIVES

AIM

Anatomical study of *Trika Pradesha* according to Ayurvedic and Modern literary study

OBJECTIVES

1. To define *Trika Pradesha* on modern anatomical grounds.
2. To study applied anatomy of sacral region.

MATERIALS AND METHODS

Material

This is literature type of research, textual material is used for the study from which various references have been collected, Main ayurvedic texts used in this study are *Brhatrayee* and *Laghutrayee*, available commentaries on it, Literature of modern anatomy text will also be used. Research article available on internet will be studied.

Method of collection of data

- Ayurvedic literature related to *Trika Pradesha* is collected from Ayurvedic classics.
- Modern anatomical literature will be collected from various modern anatomy books and digital library, e-journals etc.
- Collected data has to be discussed and analyzed to approach the objectives

Source of data

Shree Shivayogeshwar Rural Ayurvedic College and Hospital Inchal central library and other search engines.

REVIEW OF LITERATURE

Historical Review

Vedic Period

In the *Rigveda* and *Atharvaveda*, *Anuka* and *Anukyat* words has been used for the back or spine.^[1] The other words mentioned are *Prishtha*,^[2] *Prishthat*,^[3] *Prishtani*^[4] and *Prishte*.^[5]

In another reference it is mentioned that, remove away the disease from the *Griva*, *Ushniha*, *Kikas* and *Anukya*⁶. Here the word *Kikas* is used for the spine but some scholars are of the opinion that *Kikas* means cervical spine and *Anukya* means thoracolumbar spine.

Pauranika Period

- In *Garuda Purana*, Ayurveda related subjects are described in detail.
- *Anukyam* signifies the vertebral column.

Samhita Kaal

Charaka Samhita

Prishtha Graha has been mentioned as a *Nanatmaja Vyadhi* of *Vata* along with its associated symptoms like *Pada Shoola*, *Pada Suptata*, *Prishtha Shoola*, *Trika Shoola*, etc.

Ashtanga Sangraha

In Su. 20th chapter mentioned *Kati* as *Vatasthana*, *Shroni* as *Apana vata karmakshetra*, *Shroni bheda* & *Trika Graha* as *Vataja Vikara* in Ni. 15th chapter *Trika Prishtha Kati Graha* as *Lakshanas* of *Pakwashayagata Vata*. *Kati Ashrita Vayu* stretches the *Kandaras*.

Ashtanga Hridaya

In Ni. 15th chapter *Trika Prishtha Katigraha* is mentioned as the *Vrudhavaatakarma*.

Vangasena

In *Vatavyadhi Adhikara* mentioned *Parshwaprishtha Katigraha* as the premonitory symptom of *Vata Vyadhi*. In *Gudagatavata Lakshana* mentioned *Trikashoola* & *Shopha*. In *Basti Karma Adhikara* advised *Vaitarana Basti* for *Ghora Shoola* & *Shotha* in *Kati Uru Prushtha* caused by *Vata*.

Sangraha Kala

Chakradatta mentioned *Vaksha Trikadi Gata Vata Chikitsa* in *Vata Vyadhi*.

Yogaratanakara

In *Vata Vyadhi Nidana* mentioned *Kati Shoola* & the use of *Eranda Taila* in its treatment. While explaining *Guda Sthita Vata Lakshanas* mentioned *Trika Prishtha Shopha*. In *Pakwashaya Gata Vata Lakshanas* mentioned *Trika Vedana*.

Bhaishajya Ratnavali

In *Vataroga Adhikara* mentioned *Vaksha Trikadi Gata Vata Chikitsa*.

AYURVEDIC REVIEW**Etymology**

Tri + Ka, where “*Tri*” is masculine gender⁷ and “*Ka*” is the first consonant of the alphabet and the first guttural letter (corresponding to in sound to “*k*” in king or keep)⁸.

Trika in the history of ancient India

- *Trika* in *Vyakarana* (grammar) glossary:

Source: Wikisource: A dictionary of Sanskrit grammar:

Trika = triad; a term used in the *Mahabhasya* in connection with the *Vibhakti* affixes i.e., case endings and personal endings which are in groups of three; M.Bh. on P.I.1, 38; cf. also M. Bh. om P.I.4.101; also M. Bh. on II.2.23, V.1.52, V.1.58.

- *Trika* in *Chandas* (prosody, study of Sanskrit metres) glossary:

According to Shodhganga: a concise history of Sanskrit *Chanda* literature

Trika is a technical term used in prosody (chandas shastra) especially, used to denote the *Ganas* who have three letters each in *Varna* type of metres. *Purana* and *Itihasa* (epic history)

- *Trika* in *Purana* and *Itihasa* glossary:

Source: archive.org: Shiva Purana - English Translation:

Trika is the name of a Sage who once attended a great sacrifice by Daksha, according to the Shivapurana 2.2.27. Accordingly, as Brahma narrated to Narada: — “[...] once a great sacrifice was started by Daksha, O sage. To partake in that sacrifice, the celestial and terrestrial sages and devas were invited by Shiva and they reached the place being deluded by *Shiva’s Maya*. [*Trika* ...] and many others along with their sons and wives arrived at the sacrifice of Daksha—my son”.

- *Trika* in *Shaivism* (*Shaiva* philosophy) glossary:

Source: Google Books: The Bloomsbury Research Handbook of Vedanta (Shaivism).

Trika refers to the system of the non-dual traditions of Tantra Shaivism. The *Trika* tradition centers on the worship of three Goddesses: the benevolent *Paraa*, and her fierce manifestations *Paraaparaa* and *Aparaa*. The scriptures of the *Trika* include, among others, the *Siddhayogeshvareematatantra* (its earliest text dated to the seventh century), *Maalinivijayottara*, *Tantrasadbhava*, *Paratrishika*, and *Vigyananabhairavatantra*.

- *Trika* in India history glossary

Source: Cologne Digital Sanskrit Dictionaries: Indian Epigraphical Glossary:

Trika, a group of three figures of the *Tirthankaras*.

Note: *Trika* is defined in the “Indian epigraphical glossary” as it can be found on ancient inscriptions commonly written in Sanskrit, Prakrit or Dravidian languages.

- According to Shabda-Sagara Sanskrit-English Dictionary:

Trika - a. [*Trayāṇām Saṁghaḥ Kan*]

Tri:

- Triple, three-fold.
- Forming a triad; Rv. 1.59.9.
- Three per cent; cf. *Ms.8.152 Kull*.
- Happening the third time.

Kam:

- A triad; *Bhāg*.11.2.42.
- A place where three roads meet.
- The lower part of the spine, the part about the hips; Ak. (Mar. mākaḍahāḍa); Pt.1.19; R.6.16; *Chiinna Trika Sthanaa Kechit*..... Shiva. B.13.126.
- The part between the shoulder blades.
- The three spines.

Kā:

- A contrivance for rising water over which passes the rope of the bucket.
- The cover of a well.^[9]

Definition

The site of adjoining of three bones on the back at vertebral column is called *Trikam*.^[10] *Trika* is the lower portion of backbone loins, hips, a place where three roads meet, a triad or a group of three or triple.^[11]

According to Shabda Kalpa Druma

Trika is considered as the region where 3 structures or parts meet or come in unison.^[12]

According to *Vaidyaka Shabda Sindhu* - Is the back part or extreme part of the *Kati*.^[13]

Trika is considered as the *Shroni Kanda Bhaaga*^[14] i.e., stems part of Hip bone. *Acharya Sushruta* while mentioning 5 *Asthis* present in the *Kati Pradesha*, says one *Asthi* is present in the *Trika Pradesha* so *Trika* is the region present in the *Madhya Shareera*. Su.Sha. 5/16

According to Amarakosha

Trika forms the *Adhaara* or base for *Prushtavamsha*.^[15]

Synonyms

Prushtha^[15]

Garbhabhava

Trika as *Asthi Sandhi* and influencing *Garbhabhava*

Acharya Charaka has explained that these *Garbhaja Bhavas* play an important role in the development of various structures as well as characteristics of the

Garbha. Asthi, Sira, Snayu are explained to be *Pitruja Bhavas*. So, *Trika* can be considered one of *Pitruja Bhavas*.^[16]

Pramana of Trika

Acharya Charaka says that *Trika* is 12 *Angulas* in height, on which *Chakrapani* comments that it extends from *Guda Asthi* till *Shroniphalaka*.^[17] *Acharya Vagbhata* opines *Trika* is 12 *Angula* in *Utsedha* (height).

Location of Trika

In *Samhitas*, Cha.Si.1/40 - *Shroni* or *Kati* is mentioned as a region^[18] rather than an organ. While numbering the *Siraas*.

Acharya Vagbhata has explained As.Hr.Sha.3/21 *Arunadatta* opines i.e, 32 *Siras*,^[19] among the 136 *Siras* present in the *Antaradhi*,^[20] are located in *Shroni*. Thus, to infer that *Shroni* is a region in the *Antharadhi*.

Limitations of Trika

Definite demarcation of the *Kati* region is not given in *Samhitas*, but limitations could be inferred with the help of the surrounding structures. Upper limitation - could be taken as *Nabhi*.^[21,22] Lower limitation could be taken as the *Medhra & Mushka*.^[23]

Trikagata Roga (Applied anatomy of Trika)

Trika is the *Sthana* for *Vata Dosha*. In many disorders, *Trika* is affected leading to many disabilities. *Trika Graha* - *Nanaatmaja Vikaras, Sahaja Arsha & Madatyaya. Trika Shula* - *Apatarpana Vikaras, Vataja Arsha* etc. *Trika Vedana* - *Vatavyadhi & Jwara* etc.

Dimension of Kati

Dimension of *Kati* is described as - 16 *Angula*.^[24]

Chakrapani comments on this quoting that the height of *Kati* is not mentioned since another *Sandhi* is present between the heights of *Uru* (thigh) & *Antharadhi* (thorax & abdomen). According to *Acharya Sushruta*, dimension of male chest is same as a dimension of female waist. The dimension of female chest is 18 *Angula* which is same as male waist.^[25]

Vice a versa female waist is 12 *Angula* which is same as a male chest.^[26]

According to *Acharya Charaka*, *Kati* is 1/3 of chest.^[27]

According to *Sushruta*, the main site of *Medha-dhatu* is *Kati* and *Vrukka*.^[28]

Acharya Vagbhata mentioned the *Vistara* (diameter) & *Parinaaha* (circumference) for *Kati*, *Vistara* as 16 *Angulas* & *Parinaaha* as 50 *Angulas*.^[29]

Nirukti of Prishtavamsha

The term *Prishthavamsha* is made up of 2 words, '*Prishtha & Vamsha*'. *Prishtha* according to *Amarkosha* 2/6/76 means 'standing forth prominently' or the back which is prominent part of an animal. *Vamsha* refers to *Bamboo* cane or *Reed pipe*. So, back bones of the body are referred as *Prishtha Vamsha*.

Paryaya: *Prushtha Vamsha, Prushtha Asthi, Kaseru*.^[30]

Structures in Kati-Trika Pradesha

Kati & Trika are regions present within the *Antharadhi*. Su.Sha.9/7.

1. Asthi

Mainly 5 *Asthis*^[31] present in this region 1 *Gudasthi*, 1 *Bhagaasthi*, 2 *Nitambasthis*, 1 *Trikasthi*. *Trikasthi* forms the base of the *Prushthavamsha*. It is present in between *Gudasthi & Prushtha Vamsha* between 2 *Kati Kapaalas*. *Acharya Charaka* mentions that 2 *Shroniphalakas* & a *Bhagasthi* is present in *Shroni Pradesha*.^[32]

2. Sandhi

Acharya Sushruta tells that among the 2 types of *Sandhis* mentioned, i.e., *Cheshtaavanta & Sthira*, *Sandhi* present in *Kati Pradesha* belong to *Cheshtaavanta Sandhi*.^[33] Among the 8 types of *Sandhis* mentioned, 3 types of *Sandhis* are present in this region. Su.Sha.5/26-27

- In *Kati Kapala*^[34,35] 3 *Sandhis* of *Tunnasevani*^[36] types are present, *Trikasthi* forms 2 types of *Sandhis* with different *Asthis* present in its vicinity.
- *Pratara* type of *Sandhi* with *Prushthavamsha*.^[37]
- *Samudga* type of *Sandhi* with 2 *Nitambasthis*.^[38]
- *Saamudga* type of *Sandhi* with *Gudasthi*.^[38]

3. Samghaata

The complex joints of *Asthis* present in the body are called *Samghataas*. One among the 14 *Asthi Samghataas* in the *Shareera*, is present in *Trika Pradesha*.^[39] Here there is a communion of *Trika Asthi* along with *Gudasthi & 2 Kati Kapaalas*. Su.Sha.5/16

4. Sira

Among the 700 *Siras* mentioned, 32 *Siras* are told to be present in *Shroni*.^[40] They are *Vatavaha, Pittavaha, Kaphavaha & Raktavaha Siras* each 8 in number.^[41]

5. Dhamani

Acharya Sushruta says, among 24 *Dhamanis*, 10 *Adhoga Dhamanis* supply *Pakwashaya, Kati*,^[42] *Mutra, Pureesha* etc. Su.Sha.9/7

6. Snaayu

Snayus are structures resembling the shape of a hemp.^[43] Among 900 *Snayus* in the body, 230 *Snayus* are said to be present in the *Madhya Shareera*, among which 60 are present in *Kati*.^[44]

7. Kandara

Kandaraas are considered as strong or great *Snaayus*.^[45] Dalhan – Su.Sha.5/11

16 *Kandaras* are present in the body which helps in performing actions like extension & flexion.^[46] Bha.P.Pu.3/269

Among them four *Kandaras* present in the *Prushtha* which tightly binds the *Shroni* with *Prushtha & the Nitamba*^[47] & other parts of the lower regions.^[48] Su.Sha.5/11 & Bha.P.Pu.3/268

Kaviraj Haranachandra Chakravarti says that these *Kandaras* connects *Shroni, Prushtha & Trik Asthi*.^[49]

8. Pratyangas: *Pratyangas* present in *Kati* are: *Jaghana*,^[50] *Guda*,^[51] *Medhra*,^[52] *Bhaga*,^[52] and *Basti*.^[53]

Kati-Trikagata Asthi Sandhi Shaareera

Kati-Trika Sandhi region refers to the junction of low back region along with the region of Ileum part of Hip bone & sacral region.

Sandhi Sankhya

Acharya Susruta has explained 3 Sandhis in Kati Kapala.

Sandhi Prakaara

Cheshtaavanta & Pratara types of Sandhis are present in the Kati Pradesha. Pratara, Tunnasevani & Samudga types of Sandhis are present in the Trika region. i.e. Pratara type with Kati Prushtha Vamshasthi, Tunnasevani variety of Sandhi with Kati Kapala and Samudga variety with Gudasthi.

Structures constituting a Sandhi are as mentioned below:

Asthi, Snayu, Shleshma, Shleshmadharaa Kalaa, Sira, Dhamani, Maamsarajju, Peshi, Kandaraa

Asthi forms the prominent part of any Sandhi. In Kati-Trika region 5 *Asthis* are mentioned to be present in Shroni Pradesha, & 3 Sandhis present in the Kati Kapala, 24 Prushtvamsha *Asthi* Sandhis are present & Trika is mentioned to have *Asthi Samghata*. Definite number of *Asthi Sandhi* in this region not told.

Five *Asthis* are present in Kati Pradesha including One Trika *Asthi*. Tarunasthis are also present in between these *Asthis*.

Asthi is the fifth dhatu of the body.^[54] The main function attributed to this *Dhatu* is the Dharana Karma. Kati-Trika Prushtha Vamshagata *Asthis* help in transmitting the weight from the upper part of the body to the lower limbs and then maintaining the erect posture of the body.

Trika as Asthi

1 Gudasthi, 1 Bhagasthi, 2 Nitambasthis.

Trikgata Roga

In Ayurvedic classics the descriptions about the symptomatology developed in Kati-Trika Prushatavamsha Pradesha in different pathological conditions are Trika Shoola, Trika Graham, Prushta Graha.

Trika Graha

Trika means "Trayaanaam Sandhayaha," i.e.; union of three bones / three Avayavas in any part of the body. Pectoral girdle, Pelvic girdle & sternoclavicular joint

come under Trika. Here Sacroiliac region may be taken as Trika. Trika Graham is seen as a symptom in Triteeyaka Jwara,^[55] as a common symptom in Madaatyaya Roga^[56] & as Pakwashaya Gata Vata Kopa Lakshana.^[57]

Trika-Shoola

Trika shoola refers to the pain produced in the joint of Sphik Asthi & Prishtavamsha Asthi by the vitiation of Vata. Trika Shoola is a symptom in Pakwashaya Sthita Vata Kopa Lakshana,^[58] Amavata^[59] and Gudasthita Vata.^[60]

Prushta-Graha

Prushtavamsha denotes vertebral column; it holds back causing pain in this region & is called as Prushtagraha. The terms Kati, Prushta & Trika is included in Low back region. Depending upon the region where pain is felt, it is termed as such. If we correlate these structures to the modern anatomical description, the structures Trika can be correlated to be the structures present between Sphik & Prushta i.e., the lumbosacral region.

Gridhrasi also bear some importance in this regard. Gridhrasi starts from Sphik & gradually comes down to waist, back, thigh, knee, shank & foot & affects these parts with stiffness, distress & piercing pain & also frequent quivering.^[61]

Katigraha can be diagnosed based on its cardinal features like pain experienced from Kati Prushta, Sphik region causing Sthabdata & Grahana in Gamana Karma which can in later stages lead to the manifestation of Gridhrasee Vyadhi when the pain radiates down towards Uru, Jaanu, Jangha and Paada. In case of some disease like Khalli, Pangu, Khanja etc. some symptoms can be seen in common with the Katigraha and should be differentiated clinically. The Vyavacchedaka includes, Khanja, Pangu, Gudagata Vata, Snaayugata Vata, Kukundara Marma Abhigaata, Pakvaashayagata Vata, and Gridhrasee.

Khanja and Pangu^[62,63]

In Khanja and Pangu the vitiated Vata takes Sthana Samshraya in Kati Pradesha and affects the Kandara

and *Sakthi* leading to symptoms like paralysis or *Aakshepaka*. If it affects only one lower limb it's called as *Khanja* and if it affects both the lower limbs then it's called *Pangu*. Though there is difficulty in walking, there is no pain present in this condition.

Gudagata Vata^[64]

In this disorder there will be pain in leg, thigh, sacral region and back associated with retention of stools, urine, flatus, colicky pain and flatulence. But radiating pain is absent in this disorder.

Snayugata Vata^[65]

Here there will be *Ayama* i.e., bending along with other disorders like *Khalli*, *Kubjatva*, *Sarvanga* and *Ekanga Roga* which are not present in the *Katigraha*.

Rachanaanusara Nidana

The *Nidana* can be classified according to *Rachana* into:

- *Sandhivikruti Janya*
- *Kalavikruti Janya*
- *Asthi Vikruti Janya*
- *Tarunasthi Vikruti Janya*
- *Snayu, Kandara, Sira, Dhamani, Peshi, Maamsarajju Vikruti Janya*
- *Marmabhigata*
- *Dhatukshaya and Margavarana*
- *Margavarodha*

Pakvashayagata Vata^[66]

Here along with the pain in *Kati, Trika, Prushta* the symptoms like distension of the abdomen and colicky pain will be present.

Kukundara Marmabhigata^[67]

This *Marma* is present on the either side of the *Prushtavamsha*. Any injury to this *Marma* will lead to *Sparsha Ajnana* and *Cheshta Haani*. However, the involvement of *Marma* in the pathology of *Katigraha* can be understood, but injury alone to the *Marma* resulting in *Katigraha* is not mentioned in the *Marma Viddha Lakshana*.

Gridhrasee^[68]

Gridhrasee is a *Vyadhi* where structural and functional deformity of *Kati-Trika Prushtavamsha* occurs, leading to radiating pain starting from low back till the toes of lower limb resulting in *Karmakshaya*.

Anatomy & Physiology of Lumbosacral Joint

The sacrum articulates superiorly with the lumbar part of the vertebral column. The lumbosacral joints are formed between vertebra Lumbar 5th and the sacrum and consist of: the two zygapophysial joints, which occur between adjacent inferior and superior articular processes; and an intervertebral disc that joins the bodies of vertebrae Lumbar 5th and Sacrum.^[69]

The Lumbar vertebrae are identified by their massive reniform bodies and presence of Mamillary and Accessory tubercles on their Vertebral arches.

Fifth (Atypical) Lumbar Vertebra^[70]

1. The most important distinguishing features are as follows.
 - a) The transverse processes are thick, short and pyramidal in shape. Their base is attached to the whole thickness of the pedicle and encroaches on the side of the body.
 - b) The distance between the inferior articular processes is equal to or more than the distance between the superior articular processes.
 - c) The spine is small, short and rounded at the tip.
2. Other features of the fifth lumbar vertebra are as follows.
 - a) The body is the largest of all lumbar vertebrae. Its anterior surface is much extensive than the posterior surface. This difference is responsible for the creation of the sharp lumbosacral angle or sacrovertebral angle and is 120° in an adult.
 - b) The pedicles are directed backwards and laterally.

- c) The superior articular facets look more backwards than medially and the inferior articular facets look more forwards than laterally as compared to other lumbar vertebrae.

Sacrum^[71]

The word meaning of the term Sacrum is 'holy'. It is large, flattened, triangular bone formed by the fusion of five sacral vertebrae. It lies obliquely at the upper and posterior part of pelvic cavity between two hip bones. Because of its oblique position, it forms an angle with the rest of vertebral column known as Sacro-vertebral or Lumbo-sacral angle which is about 210 degrees.

Lumbo-Sacral Triangle of Marcille^[72]

It is a Triangular interval on each side of the body of fifth Lumbar vertebra.

The Bony Pelvis^[73]

The Pelvis is derived from a Latin word which means 'Basin'. It is a ring of bone consisting of two Hip bones in front and at the sides, and the Sacro-Coccygeal part of the vertebral column behind. The pubic parts of Hip bones are connected to each other by the Symphysis pubis which is a secondary cartilaginous joint; the corresponding surfaces of the ilium of Hip bones forming a pair of plane synovial Sacro-iliac joints. Postero-laterally, pairs of Sacro-tuberous and Sacro-spinous ligaments connect the sides of the Sacrum and Coccyx respectively with the infero-medial margins of the ischial tuberosities and the tips of the ischial spines. The plane of pelvic inlet (pelvic brim) slopes obliquely downwards and forwards, and divides the pelvis into an upper, wider Greater pelvis (false pelvis), and lower narrower lesser pelvis (true pelvis).

Articulation^[74]

1. Lumbosacral Joint

The articulation between the fifth Lumbar vertebra and the first segment of the Sacrum resembles the joint between any two typical Vertebrae. The bodies of the fifth Lumbar vertebra and first sacral vertebra are united by a very large intervertebral disc which is

thicker ventrally, and this accounts for the prominence of the Lumbosacral angle. The right and left Zygapophyseal joints between the inferior articular processes of the fifth Lumbar vertebra and the Superior Articular Processes of the Sacrum are separated by a wider interval than those of the Vertebra above. In addition to the fifth Lumbar vertebra, it is attached to the Ilium and Sacrum by the Iliolumbar ligament. The Iliolumbar and Lumbosacral ligaments, and the articular facets between the articular processes of the fifth Lumbar and first sacral vertebrae deserve special mention.

Iliolumbar ligament

- It is attached to the tip and to the lower and front part of the transverse process of the fifth Lumbar vertebra and occasionally has an additional, weak attachment to the transverse process of the fourth Lumbar vertebra.
- It radiates as it passes laterally and is attached by two main bands to the Pelvis. The lower band which is often termed as Lumbosacral ligament runs from the inferior aspect of the fifth Lumbar transverse process to the anterior part of the upper surface of the lateral part of the Sacrum, blending with the Ventral Sacro- Iliac ligament.
- The upper band, which gives partial origin to the Quadratus Lumborum, is attached to the crest of the Ilium immediately in front of the Sacroiliac joint and is continuous above with the thoracolumbar fascia.
- The Iliolumbar ligaments limit the axial rotation of the fifth Lumbar vertebra on the Sacrum.

2. Sacroiliac Joint

It is a Synovial joint between Auricular surfaces of the Ilium and Sacrum. But for a Synovial joint it is atypical on three accounts, cartilage is fibrocartilage, surfaces are jagged and the movements allowed are little. The Sacroiliac articulation depends entirely upon ligaments.

The two joint surfaces lie in diverging planes, the weight of L5 vertebra tends to push the Sacrum down

towards the Symphysis. There is no bony factor in stability. The articular surface of the Sacrum is covered with hyaline cartilage and that of Ilium with fibrocartilage.

The ligaments which help in the formation of this joint are, these consist of Capsular ligament, Ventral, Interosseous and Dorsal Sacro- Iliac ligaments. The Sacrotuberous and Sacrospinous ligaments subserve as Accessory ligaments.

3. Sacrococcygeal Joint

It is a symphysis between Apex of Sacrum and the base of Coccyx with an intervening disc or fibrocartilage. The ligaments are: A ventral Sacrococcygeal ligament which is short and present ventrally, represents a remnant of the Anterior longitudinal ligament. Two dorsal sacrococcygeal ligaments which are short and are deep consist of superficial and deep parts. The superficial part fills up the Hiatus sacralis and extends from the margin of the sacral hiatus to the posterior surface of the Coccyx. The deep part connects the adjoining surfaces of the Sacrum and Coccyx. The space between the two parts is occupied by the Filum terminale, fifth pair of sacral nerves and one pair of coccygeal nerves. Lateral sacrococcygeal ligaments present on each side of the Sacrum, Connects the rudimentary transverse process of the first coccygeal vertebra with the infero-lateral angle of the Sacrum. The paired Intercornual ligaments connect the Sacral and Coccygeal cornua.

Derangements of the discs^[75]

- Nuclear retropulsion
- Nuclear retropulsion
- Spondylosis deformans
- Partial or complete Sacralization

Degenerative changes in lumbar vertebra

- Spondylolysis.
- Spondylitis
- Spondylolisthesis.
- Intervetebral disc herniation

DISCUSSION

Trika as bone

Charaka speaks of two bones in the pelvic cavity, i.e., hip bone on both sides. According to modern anatomists that each hip bone is composed of three different bones: ilium, the upper portion, ischium, the lower part, and the pubis, the portion joined to the other hip bone. The ilium and ischium, however, though they are two bones in the body of an infant, become fused together as one bone in adult life, and from this point of view the counting of ilium and ischium as one bone is justifiable. In addition to these a separate *Bhagasthi* is counted by *Charaka*. He probably considered the sacrum and coccyx to be one bone which formed a part of the vertebral column. By *Bhagasthi* he probably meant the pubic bone; for Chakrapani, commenting upon *Bhagasthi*. Sushruta, however, counts five bones: four in the *Guda*, *Bhaga*, *Nitamba* and one in the *Trika*. *Nitamba* corresponds to the two *Shroni-Phalaka* of *Charaka*, *Bhaga* to the *Bhagasthi*, or pubic bone, *guda* to the coccyx and *Trika* to the triangular bone sacrum.

The main difference between Sushruta and *Charaka* is the latter counts the sacrum and coccyx as one bone forming part of the vertebral column, the former considers them as two bones and as separate from the vertebral column.

Vāgbhata takes *Trika* and *Guda* as one bone, but separates it from the vertebral column.

CONCLUSION

From above mentioned verses from Ayurvedic text it is clear that: It will be better to take *Trika Pradesha* as sacral region in osteological aspect. The *Trika-Sanghata* form *Shroni* i.e., bony pelvis. Hence expert physician highly appreciates the knowledge anatomy.

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