

A Study on Asthi Sanghata W.S.R. to Trika Asthi Sanghata

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Abstract:

There are 14 type of Asthi Sanghata described by Acharya Sushruta, they are Gulpha, Janu, Vankshana, Manibandha, Kurpara, Kaksha, remaining in Trika and shira Pradesh. According to Acharya sushruta the word Trika is used in two contexts the one is Shroni kaand bhaaga Trika and another Bahu Griva Asthi Trika. As per Dalhana in the context of Amsa marma, Trika is that connection between Greeva and Amsa dvaya. This study will help to locate the Trika Asthi Sanghata in cadaver by dissection method.

Aim and objective: To locate Asthi Sanghata in the cadaver and study the regional anatomy of Trika Asthi Sanghata in cadaver.

Materials and Methods: Urdhva and Adha trika located at cervical and lumbar region Dissection performed, relevant photographs were taken.

Observation and Results: In this study, 10 leg of 5 cadavers dissected as per Cunningham's practical manual anatomy and relevant photographs were taken.

Discussion: The group or union of more than 2 bones present is called Asthi Sanghata. The Trika is a region where three Structures or parts come together or congregate. As mentioned by Acharya Dalhana the word Trika used in two contexts the one is Shroni kand bhaaga Trika and another is Bahu Griva Asthi Trika. The urdhva trika is formed by the superficial back muscles and the the Adha Trika is formed by the articulation of two ilium and one sacrum bone which forms the Sacroiliac joint.

Conclusion: On the basis of Dissectional study the regional anatomy of Trika Asthi Sanghata located in cadaver.

Keywords: Sanghata, Asthi sanghata, Trika,

I. Introduction

Ayurveda has given due importance to fundamentals and postulated various measures to understand the structures presented in body. The description of sharira in Ayurveda literature is different from contemporary science. In Sharir sankhya vyakarana Acharya Sushruta has mentioned the numerical of various structures, for example 14 Kurcha, 16 Kandara, 16 jala, 4 Mamsa rajju, 7 Sevani, and sanghata. Acharya has mentioned

14 Asthi sanghata¹. Here sanghata means Samuha², 3 or to aggregate or to heap up⁴. Asthi sanghata is one of the fundamental notions in Ayurveda. Asthi Sanghata is a confluence of two or more Asthis.

Asthi sanghata are as namely three are present bilateral in lower extremity Gulpha, Janu, Vankshana and similarly bilateral in upper extremity Manibandha, Kurpura and Kaksha¹. There is one each in Trika and Shira Pradesh¹. Trika is a region where three Structures or parts assemble or congregate⁵. Trika is eminently used for shroni kanda bhaga trika in most of the theory as well as therapeutic procedure, here in the context Acharya Dalhana mentioned Asthisanghata is related to bahu greeva asthi traya sanghata trika¹. There is another reference where the word Trika is used for Greeva Pradesh, while explaining Amsaphalaka Marma. This Marma is located in relation to Trika. Acharya Dalhana quoted here, Trika refers to region where Greeva and Amsa Phalakashthi congregate⁶.

In the present work an essential review of Asthi Sanghata will be done and by performing dissection, the regional anatomy of Trika Asthi Sanghata will be studied.

II. Aim and Objectives

Aim: To study the Asthi Sanghata w.s.r. to Trika Asthi Sanghata

Objective:

1. To do conceptual study of Asthi Sanghata, Trika Asthi Sanghata and related subject matter in contemporary anatomy.
2. To locate Trika Asthi Sanghata in the cadaver
3. To study the regional anatomy of Trika Asthi Sanghata in cadaver

III. Literature Survey:

As per *Shabdkaalpdruma* - “संघात समूहः” *Sanghata* means group

“चतुर्दशास्थिसंघाताः | तेषामेकैको गुल्फजानुवक्षणागणिवंधकूर्परकक्षासु त्रिक कशिरसोश्च” (A.S.Sha.5/59)

- “चतुर्दशास्थानां सङ्घाताः तेषां त्रयो गुल्फजानुवङ्क्षणेषु, एतेनेतरसक्थि बाहू च व्याख्यातौ, त्रिकशिरसोरैकैकः” || (Su.Sha.5/16)

There are fourteen confluence of bones (place of meeting of more number of bones) of these three are in *Gulpha*(ankle), *Janu* (knee), *Vankshana* (hip), similarly in the arm, (thus twelve in the extremities), one each in the *trika* (upper back/ shoulder) and *siras* (head).

REVIEW OF TRIKA

Nirukti

“पृष्ठवंशाधरे त्रिकम्”¹

According to *Amarakosha* *Trika* is that structure which forms the *Aadhara* or base for the *Prushtavamsha*.

➤ According to *Shabda kalpa dhruma*

Trika is considered as the region where 3 structures or parts assemble or come in unison¹⁴.

Trika is a region where three Structures or parts come together or congregate.

- “यद्यपि श्रोणिकाण्डभागे त्रिकं प्रसिद्धं, तथाऽप्यत्र बाहुयीवास्थित्रयसङ्घातसन्निक उच्यते” || (*Dalhana* Su. Sha 5/16) According to Acharya *Dalhana*-

- The word *Trika* used in 2 contexts. One refers to *Shroni Kanda Bhaaga trika* another refers to *bahu greeva asthi traya sanghata trika*¹⁴.

Though the *Trika* is eminently used for *shroni kaanda bhaaga trika* in most of the theory as well as therapeutic procedure, here in the context of *Asthisanghata* it is mainly related to *Bahu Greeva Asthi Traya Sanghata Trika*¹⁴.

“त्रिकसम्बद्धे इति ग्रीवाया अंसद्वयस्य च यः संयोगः स त्रिकः, तत्र सम्बद्धे अंसफलकेः” || (Dalhana Su.Sha.6/26)

▪ In *Sushruta Samhita Acharya Dalhana* also mentioned *Trika* while explaining *Ansaphalaka Marma*¹⁵.

The relation of *Greeva* with two *Amsa marma* is the *Trika*. *Amsaphalaka* are on the back on both sides of vertebral column they attached to *Trika*, between the tip of arm and neck binding *amspitha* and *skandha* are *amsa marmas*, its injury causes loss of sensation and wasting of arms¹⁵.

“त्रिक संधारणं इति त्रिकं शिरो बाहुद्वयसन्धान स्थानम्”। (Dalhana Su.Su. 21/14)

Trika is a congregate part of *Shira* and *bahudwaya*¹⁸.

In context of *urdhva trika asthi sanghata*, the *shleshma* that present in *uras* which perform the function of *hridayaavalamban* and *annaras* passage towards *phuphus* as part of *avalamban*.

IV. Proposed Work:

Dissection of Urdhva Trika (upper back):

A vertical incision was made through the external occipital protuberance to the level of sacrum. Next incision was made through the spinous process of C7 vertebra bilaterally to the acromion process of each scapula. The skin flaps were reflected laterally, stripping the skin and superficial fascia from the deep fascia by blunt dissection. After removing the deep fascia trapezius muscle was observed. The deep fascia was removed from the surface of trapezius below the spine of the seventh cervical vertebra. The upper part of the muscle was dissected from the head and neck. The deep fascia was removed from the surface of trapezius below the spine of the C7 vertebra. Latissimus dorsi was uncovered. Attachment of the latissimus dorsi to the thoraco-lumbar fascia and to the iliac crest was defined. The lower part of trapezius was reflected by dividing the exposed part horizontally half way between the clavicle and the spine of the scapula, and vertically 5 cm lateral to the median plane. Trapezius was reflected and its attachments to the thoracic vertebral spines, the medial border of the acromion and the superior margin of the crest of the spine of the scapula defined. On the Deep superior surface of trapezius spinal accessory nerve and superficial branch of the transverse cervical nerve was observed. The upper part of the muscle at its attachments to the clavicle and the acromion was observed. The levator scapulae, rhomboid minor, and rhomboid major were seen. The rhomboid minor was attached where the spine of the scapula meets its medial border. The levator scapulae muscle was seen at this time and observed. Relevant photographs were taken.

Dissection of Adha Trika (lowerback):

The incision was made from the anterior superior iliac spine to the natal cleft followed by gluteal region dissection. The skin flaps were reflected laterally, fatty layer & superficial fascia was removed. After removing the gluteal muscles, lumbar fascia was observed. By removing lumbar fascia the Posterior Sacroiliac ligament, Sacrotuberous ligament and Sacrospinous ligament were observed. The sacroiliac joint was seen.

V. Results:

Structure observed in Dissection at the site of *Urdhva Trika* [Table no.1] [figure no. 1 to 3]

1. Skin
2. Superficial fascia
3. Fat
4. Trapezius Muscle
5. Lattisimus Dorsi
6. Rhomboid major
7. Rhomboid minor
8. Levator Scapulae

Structure observed in Dissection at the site of *Adha Trika* [Table no.2] [Figure no. 4 to 7]

- a) Thoraco lumbar fascia
- b) Sacrum
- c) Gluteal muscles
- d) Sacroiliac joint
- e) Ilium
- f) Posterior sacroiliac ligament
- g) Anterior sacroiliac ligament
- h) Interosseous sacroiliac ligament
- i) Sacrotuberous ligament
- j) Sacrospinous ligament
- k) Iliolumbar ligament

Table No 1. Comparison of Structure which found in all five Cadavers

S.N.	Structure	First		Second		Third		Fourth		Five		Total
		Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	
1	Skin	1	1	1	1	1	1	1	1	1	1	10
2	Superficial fascia	1	1	1	1	1	1	1	1	1	1	10
3	Fat	1	1	1	1	1	1	1	1	1	1	10
4	Trapezius	1	1	1	1	1	1	1	1	1	1	10
5	Lattisimus dorsi	1	1	1	1	1	1	1	1	1	1	10
6	Rhomboid major	1	1	1	1	1	1	1	1	1	1	10
7	Rhomboid minor	1	1	1	1	1	1	1	1	1	1	10
8	Levator scapulae	1	1	1	1	1	1	1	1	1	1	10

Table No. 2 Comparison of Structure which found in all five Cadavers

S.N.	Structure	First	Second	Third	Fourth	Fifth	Total
1	Thoraco lumber fascia	1	1	1	1	1	5
2	Sacrum	1	1	1	1	1	5
3	Gluteal muscles	2	2	2	2	2	10
4	Sacroiliac joint	2	2	2	2	2	10
5	Ilium	2	2	2	2	2	10
6	Posterior sacroiliac ligament	2	2	2	2	2	10
7	Anterior sacroiliac ligament	2	2	2	2	2	10
8	Interosseous sacroiliac ligament	2	2	2	2	2	10
9	Sacro tuberous ligament	2	2	2	2	2	10
10	Sacrospinous ligament	2	2	2	2	2	10
11	Iliolumbar ligament	2	2	2	2	2	10



Figure No. 1 Site of Urdhva Trika

In figure No 1 we have located area of urdhva trika by the method of dissection of back.



Figure No. 2 Trapezius and Lattisimus Dorsi

In figure no 2 after removing the skin and superficial fascia we seen the trapezius muscle and lattisimus dorsi muscle

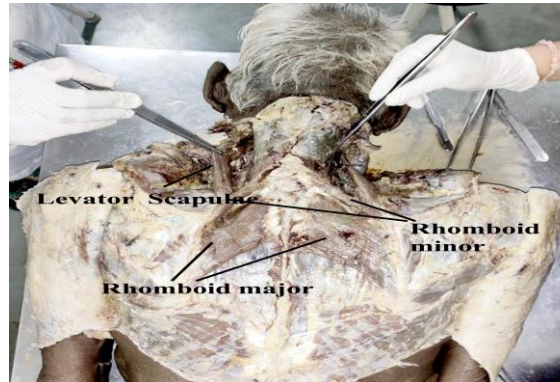


Figure No. 3 removing the trapezius muscle we seen the Levator Scapulae, Rhomboid major and Rhomboid minor muscle

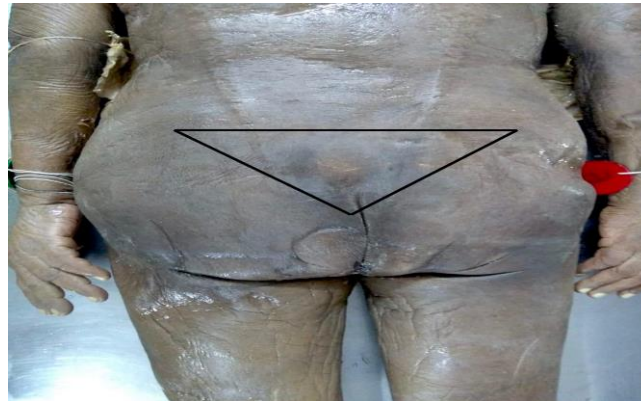


Figure No. 4 Site of Adha Trika

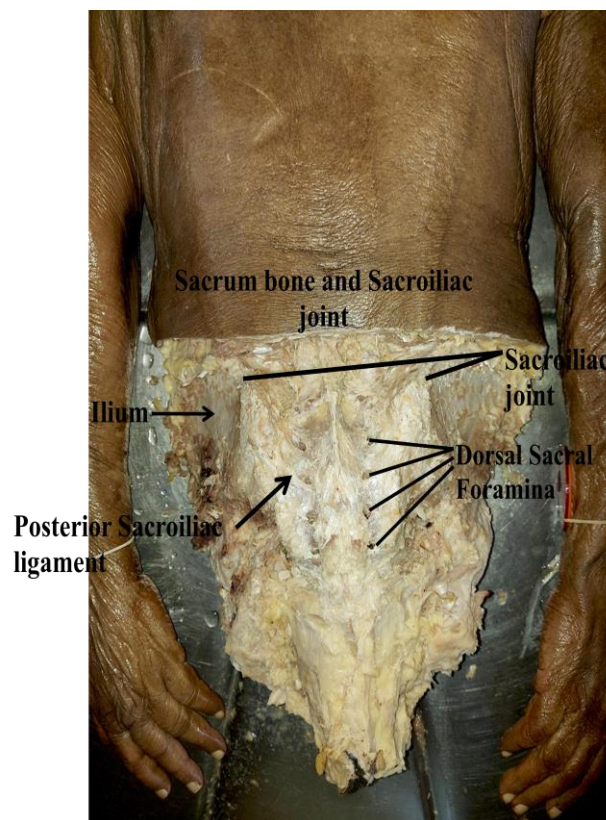
We have located area of Adha trika by the method of dissection of Gluteal region.



Figure No. 5 after removing the skin seen the fat of Gluteal Region



In Figure No. 6 the gluteal region dissection performed and seen dissected Gluteal Muscles



In Figure No.7 sacroiliac joint seen after removal of all Gluteal muscles and fat

VI. DISCUSSION

In the context of Samhita kala The description of Asthi Sanghata in Sushruta samhita, Ashtang hridaya and Ashtang Samgraha explained by definition, number and their names. All Acharya has mentioned there are 14 asthi sanghata present in our body. Different meanings for the word sanghata have been mentioned in different samhitas and dictionaries. All the Acharyas have considered the meaning of sanghata as group or collection. The group or union of more than 2 bones present is called Asthi Sanghata. In the context of Trika is a region where three Structures or parts come together or congregate. As mentioned by Acharya Dalhana the word Trika used in two contexts the one is Shroni kaand bhaaga Trika and another is Bahu Griva Asthi Trika. The urdhva trika is formed by the superficial back muscles are the Trapezius, Lattisimus dorsi, rhomboid major and minor and levator scapulae. These muscles connect right and left scapula to vertebral column in midline.. The Adha Trika is formed by the articulation of two ilium and one sacrum bone which forms the Sacroiliac joint. The study was conducted on 5 cadavers. The site of Urdhva and Adha Trika were located and was marked on skin surface.

VII. CONCLUSION

Asthi Sanghata is an articulation of two or more than two asthi. In human body 14 Asthi sanghata are present, they are Gulpha, Janu, Vankshana, in lower extremity, similarly Manibandh, Kurpara, and kaksha in upper extremity. Remaining are Trika and Shira Pradesha. The Trika sanghata can be considered as the connection between the cervical vertebra and scapula, as it is supported by Acharya Dalhanas commentary on the context of Asthi sanghata and Amsa Marma, in both the context Acharya Dalhana have specified that even the famous trika is adha trika (sacro-iliac joint) but in the context of asthi sanghata the urdhva trika has to be considered. There is no any joint between scapula and vertebral column, there is an significant connection between them through various muscles which include trapezius, levator scapulae, rhomboid major and minor. Through this connection the scapula is supported and kept in its position. This connection may be considered as the Urdva Trika. The Adha Trika is formed by the articulation of two ilium and one sacrum bone which forms the Sacroiliac joint.

VIII. REFERENCES

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