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# A comprehensive study on regional anatomy of *Urdhwa Shaakhaagata Siramarma* by cadaver dissection and their applied anatomy

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## ABSTRACT

**Introduction:** *Marma* is considered as the vital point in the body where *Mamsa*, *Sira*, *Snayu*, *Asthi*, *Sandhi* along with *Prana* resides. *Siramarma* is one such category based on the predominant *Marmavasthu*. According to *Susruta*, they are forty one in number. Among them four are present in *Urdhwashaakhaa*, i.e., two *Urvi* and two *Lohitaksha* (one on each side). Both of these are *Vaikalyakaramarma*. Injury to *Urvi Marma* causes *Shonithakshaya* which leads to *Sakthishosha*, while, injury to *Lohitaksha* leads to *Lohithakshaya* which causes *Pakshaghata* or *Maranam*. **Methods:** Collection of literary review on the *Urdhwa Shaakhaagata Sira Marma* and its *Vidhalakshanas* from various books, journals, previous work done and its *Vidhalakshanas* are analyzed. Anatomical structures found in the regions of *Urdhwa Shaakhaagata Sira Marmas* will be confirmed with the help of cadaver dissection in six bodies. **Results:** The regional anatomy of *Urvimarma* is considered as the middle of arm and *Lohitaksha Marma* is considered as the distal part of axilla. The *Vidha Lakshanas* are analyzed with applied aspect of these regions. **Interpretation & Conclusion:** *Urvimarma* is located in the middle of arm. The predominant *Siravasthu* in this region is brachial vessels, basilica vein, cephalic vein and profunda brachial vessels. *Lohitaksha Marma* is located on the distal part of axilla, the predominant *Siravasthu* in the region are third part of axillary artery and its branches and axillary vein.

**Key words:** *Urvi Marma*, *Lohitaksha Marma*, *Sakthishosha*, *Vaikalyakara Marma*.

## INTRODUCTION

The science of *Marma* or *Marma Vidhya* is extraordinary and dynamic therapy that has tremendous value in health, longevity, spiritual practice and diseases. In comparison to an elaborate

and tedious description of all the structures of the body, the knowledge of regional anatomy finds better scope in management of the injuries involving the *Marma* or the vital parts of the body. Besides the perfect knowledge of anatomy, the surgeons have to rely upon their own experiences and take care of the vital structures like nerves, arteries, joints and tendons, etc.

*Marma* is considered as the vital points of the body which causes death on traumatic injury or the place of irregular pulsation and pain on pressure and in the sense of *Jivasthana* also. This is representing the juncture of five structures i.e., *Mamsa*, *Sira*, *Snayu*, *Asthi* and *Sandhi* where *Prana* resides or flows through by its *Swabhava* as well as *Vishesha* and any injury to it leads to *Prananasa*.<sup>[1]</sup>

*Susrutha Samhitha* gives detailed information of *Marmas* have been classified into different categories

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based on the location, predominant *Marma Vasthu*, *Pramaana* and effect on injury.<sup>[2]</sup> Based on the predominant *Marma Vasthu*, *Marmas* are categorized into six types as *Mamsamarma*, *Siramarma*, *Snayumarma*, *Asthimarma* and *Sandhimarma*. According to Acharya Sushruta, *Sira Marmas* are 41 in number. Among them, *Urvi* and *Lohitaksha* are situated in *Urdhwa Shakha*.

The *Urvi Marma* is situated in the middle of *Bahu*, one on either side.<sup>[3]</sup> It is a *Shaakagata Sira Marma*<sup>[4]</sup> measuring about 1 *Angula*.<sup>[5]</sup> Based on the consequence of injury it is a *Vaikalyakara Marma*.<sup>[6]</sup> Injury to it cause *Lohitakshaya*, which further lead to *Sakthishosha*.<sup>[7]</sup>

*Lohitaksha Marma* located above *Urvi* and below *Kaksha Sandhi* in *Bahu Moola*, one on either side.<sup>[8]</sup> It is a *Shaakagata Sira Marma*<sup>[9]</sup> measuring  $\frac{1}{2}$  *Angula*.<sup>[10]</sup> Based on the consequence of the injury it is a *Vaikalyakara Marma*.<sup>[11]</sup> Injury to it cause *Lohitakshaya*, which further leads to *Pakshaghata* and *Marana*.<sup>[12]</sup>

In this study, an effort is made to study the regional anatomy of *Urdhwa Shaakaagata Siramarma* with the help of cadaver dissection and their *Viddha Lakshanas* based on clinical anatomy for their better understanding.

### OBJECTIVE OF THE STUDY

1. To study the literature on *Urdhwa Shaakhaagata Sira Marmas* and their applied anatomy.
2. To identify the regional anatomy of *Urdhwa Shaakhaagata Sira Marmas* by cadaver dissection.

### MATERIALS AND METHODS

Literary works, books, journals, including published ones related to the subject was reviewed and related informations were correlated and analyzed scientifically. Observation and identification of regional anatomy was carried out in the proximal part of both upper limbs of six cadavers. Photographs were collected. The observations then correlated with Ayurvedic and contemporary views.

### Assessment Criteria

On the basis of cadaveric dissection the regional anatomy of the *Urvi Marma* and *Lohitaksha Marma*

was determined. With the help of literary and observational study the location and anatomical structure of *Urvi* and *Lohitaksha Marma* was exacted. The applied importance is understood by studying the literature and published article.

### OBSERVATION

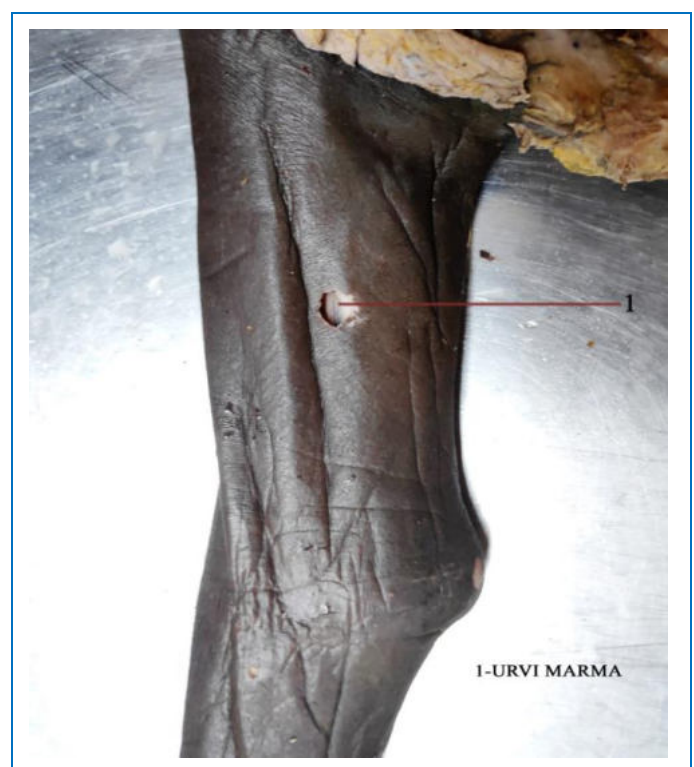
#### *Urvi Marma*

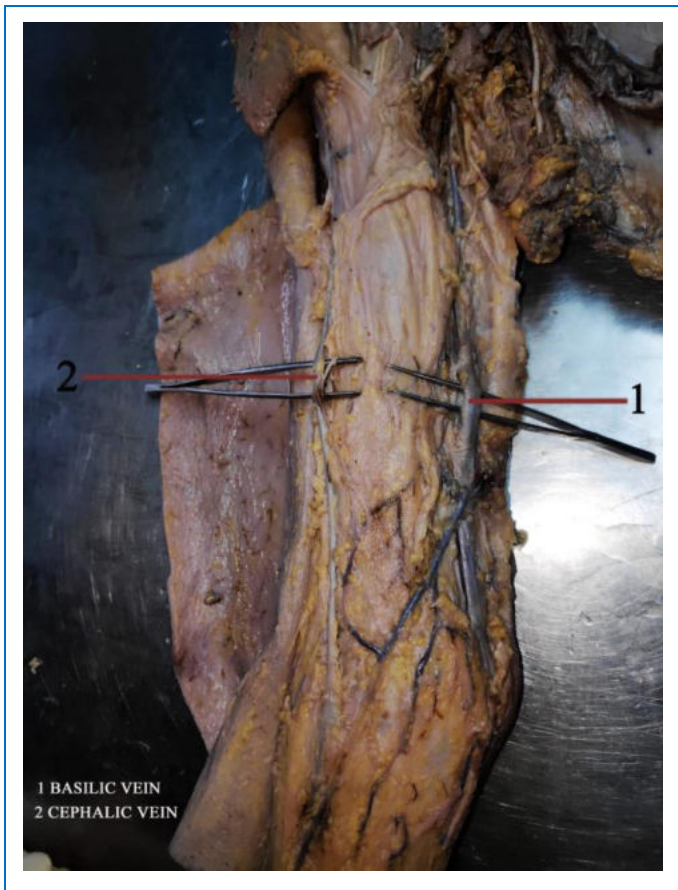
In the middle of upper limb, the dissection was carried out in the anterior aspect and posterior aspect. Deep to the skin in the anterior aspect, superficial fascia with cephalic vein and basilic vein, deep fascia, biceps brachii, coracobrachialis, brachialis, brachial artery, venae comitantes median nerve, humerus. In the posterior aspect of middle of upperlimb skin, superficial fascia, triceps brachii, radial nerve, profunda brachii vessels were observed.

#### *Lohitaksha*

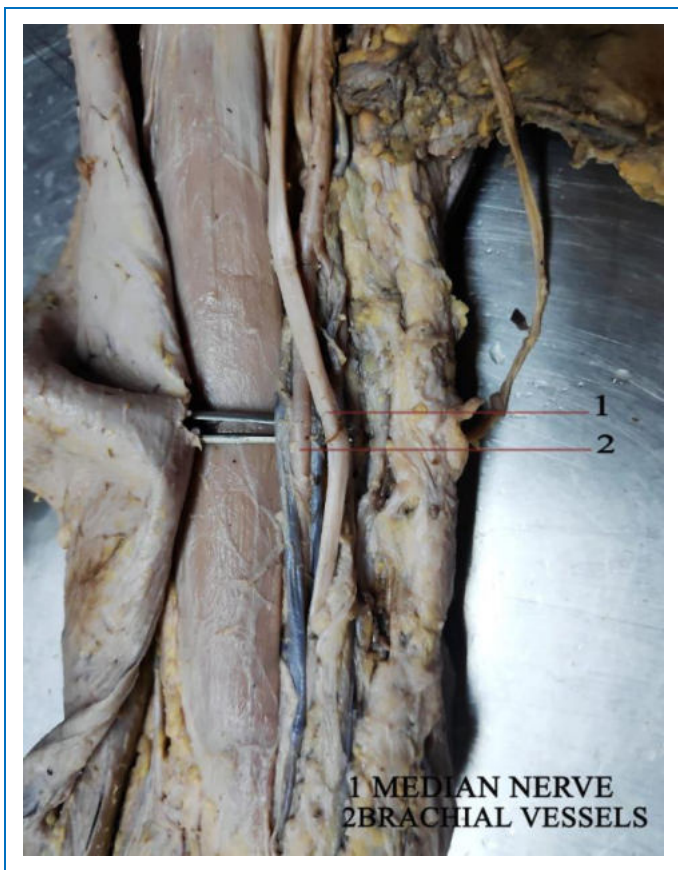
In the proximal end of upper limb anterior aspect of axilla Skin, Superficial fascia, deep fascia were reflected third part of axillary artery, axillary vein, axillary lymph node, musculocutaneous nerve, median nerve, radial nerve, ulnar nerve, medial cutaneous nerve of arm and forearm were observed.

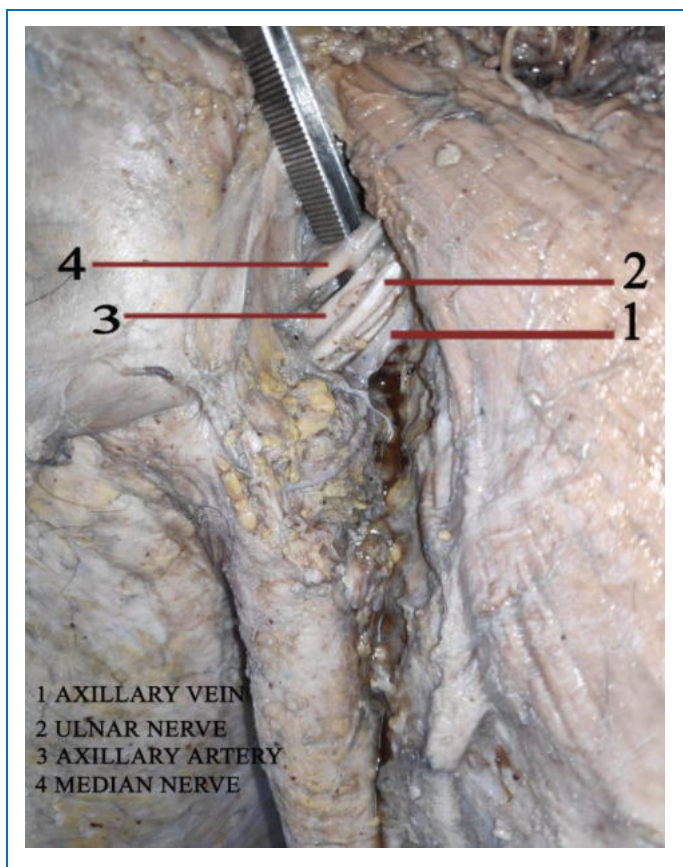
#### *Urvi Marma*





*Lohitaksha Marma*





## DISCUSSION

*Marma* is a vital point where conglomeration of *Mamsa*, *Sira*, *Snayu*, *Asthi*, *Sandhi* and *Praana* is seen. *Sira* is a channel which transports various factors from one place to another.<sup>[13]</sup> *Siras* generally provide nourishment to the body, but the one situated in *Marma* especially provide nourishment to the other four structures situated in the *Marma Sthana* i.e., *Snayu*, *Asthi*, *Sandhi* and *Mamsa*.<sup>[14]</sup> Even though Acharya Sushruta has not mentioned *Sira* and *Dhamani* separately in the *Marma Sthana*, but by the word *Sira* we can consider both *Sira* and *Dhamani*.

There are forty one *Sira Marmas* situated in our body. Among them four are present in *Urdhwa shaakha* i.e., *Urvi* and *Lohitaksha*, four are situated in *Adho Shaakha* i.e., *Urvi* and *Lohitaksha*. Injury to *Sira Marma* will lead to continuous bleeding which is thick and large in quantity, as a result of *Dhatu Kshaya* it produces *Trit* (thirst), *Bhrama* (fainting), *Swasa* (breathing difficulty), *Moha* (unconsciousness), *Hidhma* (hiccup) and finally leads to *Marana*.<sup>[15]</sup>

## Urvi Marma

On the basis of classical description the location of *Urvi Marma* can be considered as middle of arm. Here the region in the middle of arm in both anterior and posterior compartment can be taken as *Urvi Marma Sthana* as specific location is not mentioned. In the anterior compartment, the region where median nerve crosses the brachial artery and the structures around it can be considered. In the posterior compartment, the region of spiral groove and the structures around it can be considered. The *Urvi Marma* has got one *Angula* dimension, measurement of this *Marma* is ascertained within one *Angula* circumference and depth.

## Discussion on Marma Vasthu

1. *Mamsa Marma Vasthu*: Biceps brachii, Coracobrachialis, Brachialis Triceps brachii
2. *Sira Marma Vasthu*: Brachial artery and its venae comitantes, Cephalic Vein, Basilic Vein, Profunda brachii vessels
3. *Snayu Marma Vasthu*: Median Nerve, Musculo cutaneous Nerve, Ulnar Nerve, Medial cutaneous nerve of arm, Medial cutaneous nerve of fore arm, Radial Nerve.
4. *Asthi Marma Vasthu*: Humerus
5. *Sandhi Marma Vasthu*: joint between *Mamsa*, *Sira*, *Snayu*

## Discussion on Marma Vidha Lakshana

Injury to *Urvi Marma* causes *Lohithakshaya*, which further leads to *Sakthishosha*.

These symptoms may be due to following reasons

- Brachial artery is the frequently injured artery in the upper extremities. Injury to brachial artery will lead to brisk bleeding, expanding pulsatile hematoma, pale and cold extremities, absent or weak radial and ulnar pulses and associated profound neurological deficits. Median nerve injury at this level leads to paralysis of limb below the site of injury.

- The mid shaft of humerus is fractured, the radial nerve may become stretched or transected in this region leading to permanent damage and loss of function. The symptoms usually include wrist drop (due to denervation of the extensor muscle) and sensory changes over the dorsum of the hand.

Due to above said reasons, there will be *Lohita Kshaya* which leads to *Sakthisosha*. Since *Lohita Kshaya* is the main *Lakshana* and *Sira* is the important *Marma Vasthu* involved here. So it is grouped under the category of *Sira Marma*.

#### **Lohitaksha Marma**

The *Lohitaksha Marma* is situated just below the *Kaksha Sandhi* and above *Urvi Marma*. The region may be considered as the lower part of axilla. *Pramana* of *Lohitaksha Marma* is  $\frac{1}{2}$  *Angula*. Measurement of this *Marma* is ascertained within  $\frac{1}{2}$  *Angula* circumference and depth.

#### **Discussion on Marma Vasthu**

1. *Mamsa Marma Vasthu*: Pectoralis major, Pectoralis minor, Latissimus dorsi, Teres major
2. *Sira Marma Vasthu*: Axillary artery, Axillary vein, Cephalic vein
3. *Snayu Marma Vasthu*: Median Nerve, Musculo cutaneous Nerve, Ulnar Nerve, Medial cutaneous nerve of arm, Medial cutaneous nerve of forearm, Radial Nerve, Axillary nerve,
4. *Asthi Marma Vasthu*: Head of Humerus, Scapula
5. *Sandhi Marma Vasthu*: Shoulder joint

#### **Discussion on Marma Vidha Lakshana**

Injury to *Lohitaksha Marma* causes *Lohitha Kshaya* and which leads to *Pakshaghata* and *Marana*

- Trauma to the axillary artery occurs in 2.9% to 11% of cases of major arterial injury in both military and civilian series. Patients who suffer injuries to the axillary artery from blunt trauma alone may not present with early classic signs of arterial insufficiency of the upper extremity and require a high index of suspicion if delay in treatment is to be avoided.

- Anterior dislocation of the humeral head may compress the axillary artery resulting in vessel occlusion. This is unlikely to render the upper limb completely ischemic, but it may be necessary to surgical reconstruct the axillary artery to obtain pain free function.
- The axillary artery is intimately related to the brachial plexus, which may be damaged at the time of anterior dislocation leads to paralysis of upper limb.
- The axillary artery is normally anchored to the surrounding tissues by the subscapular artery. It is postulated that the sudden hyper abduction of the arm will stretch the fixed atheromatous axillary artery from its attachment to the subscapular artery, with a resulting lateral tear which leads to hemorrhage.
- Patient's undergone repair of axillary artery may ends with death due to myocardial infraction caused by thrombus. Direct injury to the axillary vein is dangerous. Bleeding is profuse. There is the risk of air being sucked into the vein producing air emboli.
- Radial nerve is injured in the axilla, as occurs in prolonged use of crutches (crutch paralysis). The effects are as follows
  1. Loss of extension of wrist due to paralysis of extensor muscle of the forearm, producing outstanding features of radial nerve lesion wrist drop.
  2. Loss of extension of elbow due to paralysis of triceps.
  3. Loss of sensation over: Posterior surface of the lower part of the arm and narrow strip over the back of forearm and Over dorsum of 1st, 2nd and 3rd metacarpals and corresponding proximal and middle phalanges.
  4. Loss of triceps and supinator reflexes

Due to above said reasons; there will *Lohita Kshaya* which leads to *Pakshaghata* and *Marana*. Since *Lohita Kshaya* is the main *Lakshana* and *Sira* is the important

*Marma Vasthu* involved here. So it is grouped under the category of *Sira Marma*.

### CONCLUSION

*Marma* is a vital point where *Mamsa*, *Sira*, *Snayu*, *Asthi*, *Sandhi* along with *Prana* resides, which on injury causes death or miseries similar to death. *Sira Marmas* are 41 in number. Among them four are situated in *Urdhwashaakha* i.e, two *Urvi* and two *Lohitaksha Marma* (1 on each limb). The region of *Urvimarma* is middle of *Bahu*. Here the region is considered as middle of arm. Both anterior and posterior aspect of middle of arm can be taken as *Urvi Marma* as specific location is not mentioned. The structures present in the anterior aspect of middle of arm are cephalic vein, basilic vein, brachial artery, median nerve crossing brachial artery from lateral to medial side, ulnar nerve, biceps brachii, insertion of coracobrachialis, origin of brachialis, middle of the shaft of humerus. The structures present in the posterior aspect of the middle of the arm are, triceps brachii, radial nerve, profundabrachii vessels in the radial groove of humerus. Brachial vessels, cephalic vein and basilic vein are the important *Sira Marma Vasthu* situated in *Urvi Marma*, injury to them results in *Lohita Kshaya* leading to *Marana*. The region of *Lohitaksha Marma* is above *Urvimarma*, below *Kakshasandhi* and in *Bahumoola*. Here the region is considered as distal part of axilla. The structures related to this region are third part of axillary artery & its branches, axillary vein, infraclavicular part of brachial plexus, anterior, posterior and central group of axillary lymph nodes. Third part of Axillary vessels are the important *sira Marma Vasthu* situated in *Lohitaksha Marma* along with infraclavicular part of brachial plexus, injury to them results in *Lohita Kshaya* leading to *Pakshagatha* and *Marana*.

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