



## A COMPREHENSIVE STUDY OF LOHITAKSHA MARMA WITH SPECIAL REFERENCE TO UPPER LIMB

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### ABSTRACT

Marma is a unique concept of Ayurveda. Marma is the site of prana. Prana is constituted by Agni, Soma, Vayu, Satwa, Rajah, Tamah, Bhoothatma and Panchendriyas. According to Acharya Sushruta, Shareera Dosha and Manasika Dosha along with Bhoothatma reside in the Marma. So, if Marma gets injured all the Dosha gets vitiated. The Lohitaksha Marma in upper limb is the Shakhagata Marma Vaikalyakar in nature and it is a Sira Marma. It is two in number. The injury effect of this Marma is mentioned as RaktaKshaya and due to which Pakshaghata or Marana will be observed. In the Sira Vyadha context, Lohitaksha Sira is mentioned as Avedhya Sira in the limbs.

**Keywords:** Marma, Lohitaksha, Avedhyasira, VaikalyakaraMarma, Upper limb.

### INTRODUCTION

The science of Ayurveda is the science of life. Marma is described with immense importance as it can cause serious ill-effects to the individual health if injured. It is defined as an anatomical site where Mamsa, Sira, Snayu, Asthi and Sandhi meet together<sup>1</sup>. Those sites which are tender and show various pulsations are Marma<sup>2</sup>. These can lead to death. The Lohitaksha Marma is the Shakhagata<sup>3</sup>, VaikalyakarMarma<sup>4</sup> and it is a Sira Marma<sup>5</sup>. It is four in number. The injury effect of this Marma is mentioned as Rakta Kshaya<sup>6</sup> and Pakshaghata<sup>7</sup> or Marana, details description of Lohitaksha Marma given in Table-1.

### Objective

- To determine the location, structural composite of Lohitaksha Marma with upper limb.
- To analysis the traumatic effect of Lohitaksha Marma with the upper limb.

### MATERIALS AND METHODS

Classical textbooks of Ayurveda, related information from textbooks of contemporary science, various journals, publications, articles, e-journals etc., in support of the research work was reviewed and related information was collected and analyzed. Dissection was carried out in the proximal part of the upper limb. Cadaveric dissection was done in P.G. Department of Rachana Sharir, Sri Ganganagar College of Ayurvedic Science & Hospital, Sri Ganganagar, Rajasthan. Observation and identification of structure and regional anatomy on cadaver was

done, photographs were collected. The observations then correlated with Ayurvedic and contemporary views.

### Assessment Criteria

Based on cadaveric dissection, the surface and regional anatomy of the Lohitaksha Marma in the upper limb (vital point near to the shoulder joint and surgical neck of the humerus) was determined. With the help of literary and observational study, the location and anatomical structure of Lohitaksha Marma was exacted. The applied importance is understood by studying the published articles, journals & various surgical books.

### Review of Literature

The word Lohitaksha means excessive loss of blood<sup>8</sup>. So, in the upper limb the Marma is situated proximal to the Bahvi Marma and distal to Kaksha Sandhi. The injury to this region would produce the conditions like Pakshaghata and Rakta Kshaya. It is Vaikalyakara Marma. Anatomical structures related to this region are the axillary artery and veins. Lymph vessels drain into an axillary group of glands, median and ulnar nerve. Latissimus dorsi, pectoralis major and minor, Coracobrachialis and subscapularis muscles.

### OBSERVATION

After determination of the gross region of Lohitaksha Marma in upper limb dissection was carried out proximal to shoulder joint. Deep into the skin the superficial fascia, superficial group of lymph nodes, deep fascia/pectoral fascia, pectoralis major,

clevipectoral fascia, pectoralis minor, axillary sheath, cords of brachial plexus, axillary artery & vein were observed. Dissection of shoulder joint also had done (Figure 1, 2, 3).

## DISCUSSION

According to Sir Monier Williams dictionary, the word meaning of Sira is- a stream; any tubular vessels of the body, nerve, vein, artery, tendon<sup>9</sup>. Sira is 700 in number, by these the entire body is nourished constantly, kept lubricated/moistened to perform actions like Akunchan, Prasaarana etc., like a large field being nourished by small channels of water, their spreading is like the ribs in leaf, Nabhi is the moola of Sira and from there, these spread upwards, downwards and sideways<sup>10</sup>.

When the Sira is injured, there will be profuse bleeding from the wound, the blood looks like Indragopa and Vata getting aggravated gives rise to many diseases. As per the reference available from classics, the Lohitaksha Marma in the upper limb is located above Bahvi Marma and below Kaksha Sandhi, at the root of the Bahu. The Kaksha Sandhi can be correlated with the shoulder joint. Bahu Moola can be understood in terms of the surgical neck of the humerus. Above the surgical neck, there is the articulation between the head of the humerus and the glenoid cavity of the scapula. Based on features and classical description the location of Marma can be exacted between the shoulder joint and surgical neck of the humerus. In the above-mentioned area mainly the axillary artery, axillary vein, and cords of the infraclavicular part of the brachial plexus are located. Based on dissection, it is observed that the pectoralis minor is dividing the course of an axillary artery by passing over it into three parts. The first part of the artery gives superior thoracic artery branch, the second part is found to give thoracoacromial and lateral thoracic artery. From the third part, three branches are emerging out viz. large branch subscapular artery, anterior and posterior circumflex humeral artery. The latter two arteries are forming anastomoses around the surgical neck of the humerus and the former coursing further to make anastomoses around the scapula. The origin of the branches from the third part closure to each other with about 1-2.5 cm. The axillary artery continuous as the brachial artery at the level of the lower border of teres major. The axillary vein is situated medial to the artery which is the continuation of the basilic vein. The cephalic vein also joins the axillary vein in the deltopectoral triangle after passing over the pectoralis minor. The third part of the axillary artery is anteriorly related to the pectoralis major and medial root of the median nerve, behind the lower part of the subscapularis and tendon of the latissimus dorsi and teres major. Lateral is the coracobrachialis along with the lateral root and then the trunk of the median nerve and for a short distance, the Musculocutaneous nerve of the forearm between the artery and vein. Anterior is the median root of the median nerve and posterior are the radial and axillary nerves. In the deeper part of these structures, ligaments of the shoulder joint particularly part of the fibrous capsule, coracohumeral and transverse humeral ligament along with the synovial sheath covering the long tendon of biceps are observed.

As per Ayurveda classics, each Marma is composed of Mamsa, Sira, Snayu, Asthiand Sandhi, but out of this one structure is predominant in each Marma. Again, Marma are classified according to traumatological effect as- Sadya Pranahara, Kalantara Pranahara, Visalyagnya, Vaikalyakara, Rujakara Marma. The injury effect of Lohitaksha Marma is mentioned as there will be Marana and Pakshaghata or Saktisadan due to Rakta

Kshaya. Rakta dhatu is extremely important for the sustenance of life. Rakta is considered as one among the Dasha Pranayatana<sup>11</sup>. It is therefore needed to protect dhatu by every possible measure. As Vata, Pitta and Kapha are responsible for the creation of the living body, a fourth entity named Rakta Dhatu also take part in the origin, sustain it and is responsible for the death.

The majorities of vascular injuries in the upper extremity are the result of penetrating trauma (almost 95% of cases) with a minority due to blunt trauma (5-10%) from motor vehicle injuries or fall<sup>12</sup>. Overall, the axillary artery is the least likely artery to be injured in these accidents, which is explained by its anatomical location<sup>13</sup>.

Injuries of the axillary artery are not common<sup>14,15</sup> and fractures of the upper end of the humerus neck are rarely associated with injuries of the axillary artery<sup>16,17</sup>, probably due to the abundance of loose connective tissue and soft tissue space in the axilla along with the absence of tight compartments. Fractures of the distal one-third of the humerus in contrast to the proximal humerus are commonly associated with brachial artery injury and radial nerve injuries because of tight compartments and proximity of the neurovascular bundle with the humerus. Scapular fracture, shoulder dislocation, and fracture clavicle are other injuries that can be associated with axillary artery injuries. Children are more susceptible to vascular injuries of the upper limb, especially supracondylar fracture, than adults.

An axillary artery injury along with brachial plexus injury incidence rates of 27-44% in the literature<sup>18</sup>. The axillary artery is more prone to injury in shoulder trauma and the third part of the artery mostly involve, as in this case. The artery is situated at the lateral margin of the pectoralis minor muscle and related with abduction and external rotation, the artery can become stretched and is at risk of rupture<sup>19</sup> Brachial plexus injury secondary to shoulder trauma usually presents with neuropraxia or axonotmesis and rarely requires any surgical management, and usually improve within 3-6 months<sup>19,20</sup>. However, if nerve rupture occurs, the outcome is good if repaired early, but a late attempt may cause fibrosis of muscles and the functional outcome may remain poor<sup>21</sup>.

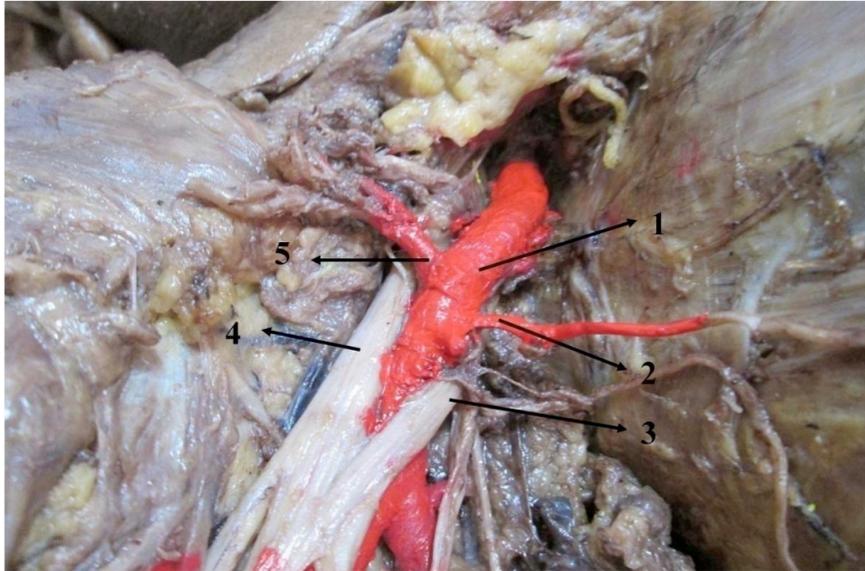
Injuries of the axillary and subclavian artery are associated with high mortality and morbidity rates. A high index of suspicion is required for early diagnosis of vascular injuries after proximal fractures of the humerus. Urgent intervention is required for axillary artery injury to prevent excessive hemorrhage or amputation.

Damage to the axillary artery and brachial plexus can present with a variety of neurovascular signs and symptoms-coldness, pallor, pulseless extremity, delayed or absent capillary refill and others. Impaired upper extremity function may occur with paresthesia or complete paralysis.

Injuries to the shoulder are not infrequent, however; because of the proximity of underlying neurovascular structures, what may appear to be an unrelated innocuous injury to the shoulder may indeed cause injury to the axillary artery and lead to severe disability, loss of limb, or death<sup>22</sup>. Delayed recognition of a vascular injury may not compromise the viability of the limb, but an injury to the brachial plexus by compression of an expanding hematoma or false aneurysm can result in severe irreversible neurologic damage<sup>23</sup>.

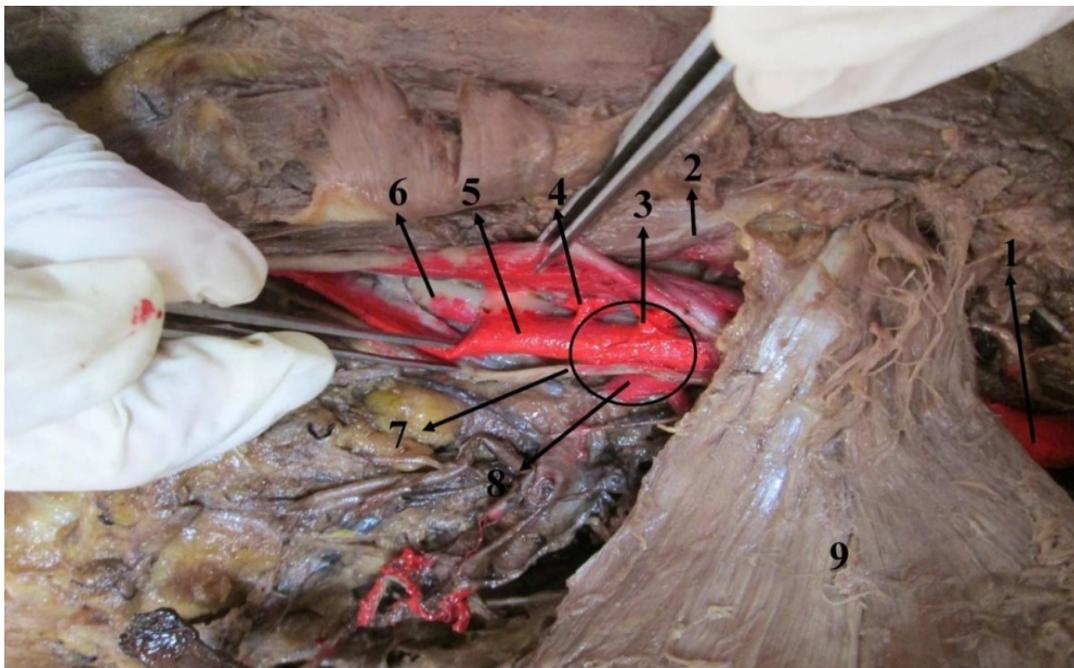
**Table 1: Description of Lohitaksha Marma**

Features	Details
Location	Shakhagata Marma
Number	4 (2 in upper limb & 2 in lower limb)
Measurement	½ Angula
Predominant structure	Sira Marma
Traumatic effect	Paralysis of a limb due to blood loss
Prognosis	Vaikalyakara



1. Second part of *axillary* artery  
 2. Lateral thoracic artery 3. A medial cord of brachial plexus  
 4. Lateral cord brachial plexus 5. Thoraco-acromial branch of axillary artery

Figure 1: Branches of the second part of axillary artery



1. First part of the axillary artery 2. Coraco brachialis muscle 3. Anterior circumflex humeral artery 4. Posterior circumflex humeral artery 5. Axillary artery 6. Posterior cord containing radial nerve 7. Location of Lohitaksha Marma 8. Subscapular artery 9. Pectoralis minor muscle.

Figure 2: Location of Lohitaksha Marma in upper limb & branches of the third part of Axillary Artery

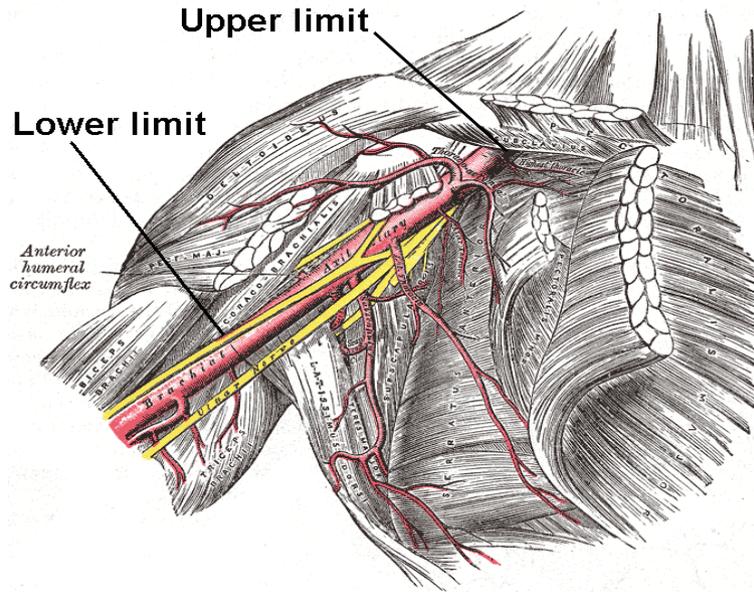


Figure 3: Location of Lohitaksha Marma in Upper Limb

## CONCLUSION

The Lohitaksha Marma is situated above the Bahvi Marma and below the Kaksha Sandhi (shoulder joint) in the case of the upper limb. The Bahu moola is considered as the surgical neck of the humerus in the case of the upper limb. In the upper limb, the structures are the third part of the axillary artery where the three branches arise along with the accompanying vein.

The Pakshaghata is considered as about that limb, which is injured, caused due to increased blood loss leading into ischemia and Paralysis or due to the injury of the surrounding nerves. Marana is considered by following ways i.e., localized death of the tissues due to ischemia or death of a person due to emboli/thrombus dislodged from the site of injury, and due to excessive loss of blood causing shock.

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