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A literature review of *Lohitaksha Marma* with special reference to anatomical structure

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ABSTRACT

According to *Sushruta*, *Marma* are constituted by confluence of *Mansa*, *Sira*, *Snayu*, *Aasthi* and *Sandhi*. They are the *Sthana* of *Prana*. According to *Acharya Sushruta*, *Marma* comprises of *Jala*, *Vayu*, *Tej*, *Satva*, *Raja*, *Tama* and *Bhootatma*, so that injury of *Marma* may lead to death. The concept of *Marma* is important in the clinical and surgical point of view. The science of *Marma* is called as half part of whole surgery. In this article an attempt is made to study the *Lohitaksha Marma* and its *Viddha Lakshana* (Traumatic effect) by considering the related literature.

Key words: *Lohitaksha*, *Marma*, *Prana*, *Viddha*

INTRODUCTION

According to some *Acharyas*, *Marmas* are defined as the anatomical places where *Mansa*, *Sira*, *Snayu*, *Asthi*, *Sandhi* meet together.^[1] *Marmas* are body's vital points where *prana* resides, injuries to them cause death or disability in the body which is difficult to cure. *Marma* the word comes from *Sanskrit* origin word '*Mri*' meaning death and the *Sanskrit* phrase '*Maryante Iti Marmani*' also means death.^[2] *Marma* are structurally classified as *Mansa Marma*, *Sira Marma*, *Snayu Marma*, *Asthi Marma* and *Sandhi Marma* according to their *Rachna*. All the ancient classics mentioned, total forty-one *Sira Marma* are present in the body in which *Lohitaksha Marma* is situated in the *Shakha* region.^[3,4] Knowledge of the *Marma* is described as half the

knowledge of *Shalyatantra* (Science of surgery), as persons injured in the vital spot die immediately or suffer from unforeseen ailment which is life threatening; if anyone survives by the efficiency of the physician, is sure to suffer from deformities.

Acharya Sushruta mentioned that *Lohitaksha Marma* is situated in *Urdhvshakha* above the *Bahvi Marma* and below the *Ansa Sandhi* and in *Adho Shakha* above the *Urvi Marma* and below *Vankshan Sandhi* at *Urumool*, thus it implies that there are four *Lohitaksha Marma* in all four *Shakha*. *Ashtang Sangraha*, *Ashtang Hridaya* and *Bhavprakash Samhita* also mentioned the same. Injury to the *Marma* leads to paralysis due to blood loss.

AIM AND OBJECTIVES

1. To study the anatomical structure present in the *Lohitaksha Marma*.
2. To study the traumatological effect (*Viddha Lakshan*) of *Lohitaksha Marma* which results in *Marana* (death) due to blood loss, and *Pakshaghata* (paralysis).

MATERIALS AND METHODS

1. Classical texts including *Sanhitas* and *Tikas* as well.
2. The modern anatomy literature from the books like grants atlas, BD Chaurasiya, greys anatomy etc. to

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study the underlying and surrounding structures around the *Lohitaksha Marma*.

REVIEW OF LITERATURE

Marmas are the sites where *Pran* resides. *Shushrut* has given a broad meaning to the word *Prana*, that is *Soma (Kapha)*, *Maruta (Vata)*, *Teja (Pitta)* and *Manasika Dosh* that is *Satva*, *Raja* and *Tama* are at the place of *Marma*. So, if the *Marma* gets injured all the *Dosha* gets vitiated. *Shareera Dosh* (*Agni, Soma, Vayu*), *Manasika Dosh* (*Satwa, Rajah, Tamah*), *Bhuthatma* and *Panchendriyas* are called as components of *Prana*.

The sites which are painful, tender and show unbearable throbbing pain after injury is considered as *Marma*.^[5]

Description of *Lohitaksha Marma* is as follows:

1.	<i>Sthan</i>	<i>Urvya Urdhva, Adho Vankshana Sandhi, Uru Mule</i>
2.	<i>Rachana</i>	<i>Sira Marma</i>
3.	<i>Parinam</i>	<i>Vaikalyakara Marma</i>
4.	<i>Pariman</i>	<i>Ardha Angula</i>
5.	<i>Viddha Lakshanas</i>	<i>Lohita-Kshaya, Maran/ Pakshghat</i>
6.	<i>Sankhya</i>	4

Lohitaksha Marma are *Sira Marma*, each in *Urdhav* and *Adho Shakha*, so four in number *Ardhangul Parimaan*. In *Urdhvshakha*, it is located above *Bahvi Marma* and below the *Ansa Sandhi*. In *Adho Shakha*, it is located above *Urvi Marma* and below *Vankshan Sandhi* in *Urumool*. Injury to this *Marma* causes *Pakshaghat* or even death due to *Rakta Kshaya*.^[6]

DISCUSSION

As described in classical texts, in *Urdhwa Shakha* the *Marma* is described to be present above the *Bahavi Marma* and below the *Kaksha Sandhi*, at the root of *Bahu*, this can be correlated as between the surgical neck of humerus and the shoulder joint. Here the

anatomical structures present are axially artery, axillary vein and the cords and branches of brachial plexus.

Axillary Artery

Axillary artery is the continuation of the subclavian artery. It extends from the outer border of 1st rib to the lower border of the teres major muscle where it continues as the brachial artery. Axillary artery is divided into 3 parts by teres minor into 1st, 2nd and 3rd parts. According to location, the 3rd part of axillary artery can be more correlated.

Branches of axillary artery

- 1st part - 1. Superior thoracic artery
- 2nd part - 2. Thoracoacromial artery
 3. Lateral thoracic artery
- 3rd part - 4. Anterior circumflex humeral artery
 5. Posterior circumflex humeral artery
 6. Subscapular artery^[7]

Axillary Vein

The Axillary vein is the continuation of basilic vein. It lies on the medial side of the brachial artery. At the outer border of the 1st rib it becomes the subclavian vein. It receives 5 out of 6 tributaries corresponding to the branches of axillary artery and the cephalic vein. The axillary vein is joined by the venae comitantes of the brachial artery a little above the lower border of the teres major.^[8]

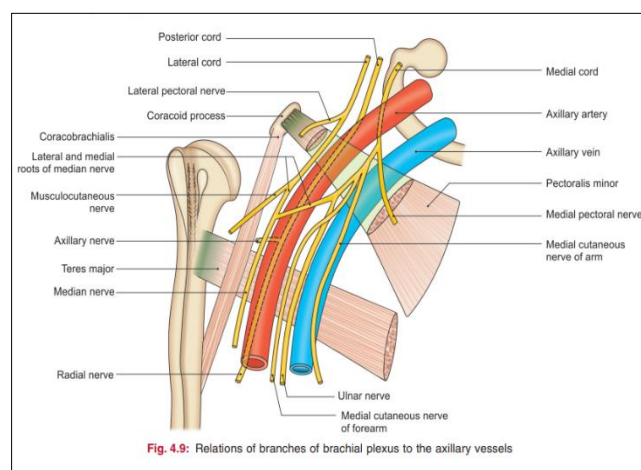


Image 1^[9]

Nerves Associated

Branches of the brachial plexus: Axillary nerve, medial cutaneous nerve, ulnar nerve, radial nerve, median nerve. All these nerves are in relation with 3rd part of axillary artery.

Marmas are formed by congruence of 5 factors. Those as per *Lohitaksha Marma* are as follows

1. *Mansa* - Teres major, Latissimus dorsi, Biceps brachii, Pectoralis major and minor, Coracobrachialis.
2. *Sira* - 3rd part of Axillary artery, Anterior & Posterior Circumflex Humeral artery, Axillary vein, Brachial artery & its venae comitantes, Lymph glands
3. *Snayu* - Median and ulnar nerve, Radial nerve
4. *Asthi* - Humerus
5. *Sandhi* - Closer to Shoulder joint^[10]

In *Adho Shakha* the *Marma* location is described as above the *Urvi Marma* and below the *Vankshana Sandhi*, at the root of the *Uru*. This can be correlated anatomically as between the hip joint and the neck shaft angle of femur where structure called femoral triangle lies. The important anatomical structures located here are femoral artery, femoral vein and femoral nerve. *Uru Moola* can be understood in terms of either, inguinal fold or angle between the neck and shaft of the femur.

Femoral Triangle

It is a triangular depression on the front of upper one-third of thigh.

Boundaries

Laterally - by medial border of sartorius

Medially - by medial border of adductor longus

Base - is formed by Inguinal ligament

Roof - by skin, superficial fascia, deep fascia

Floor - Iliacus, Psoas major, Pectineus and Adductor longus muscles

Contents

1. Femoral artery and its branches - Femoral artery is the chief artery of the lower limb. It is the continuation of external iliac artery. Femoral artery gives 3 superficial and 3 deep branches. Superficial naming- 1. Superficial external pudendal artery, 2. Superficial epigastric artery, 3. Superficial circumflex iliac artery. Deep branches are - 1. Deep external pudendal artery 2. Profunda femoris artery 3. Muscular branches.
2. Femoral artery is quite superficial in the femoral triangle. Injury to this vessel and its branches will result into fatal haemorrhage.
3. Femoral vein and its tributaries- The femoral vein accompanies the femoral artery. The vein is medial to the artery at base of triangle, but posteromedial to artery at the apex.
4. The femoral vein receives the great saphenous vein, circumflex veins and veins corresponding to the branches of femoral artery.
5. Nerves - a) Femoral nerve, b) nerve to the pectineus, c) femoral branch of genitofemoral nerve, d) lateral cutaneous nerve of thigh.
6. Deep inguinal lymph nodes and 5. Femoral sheath^[11]

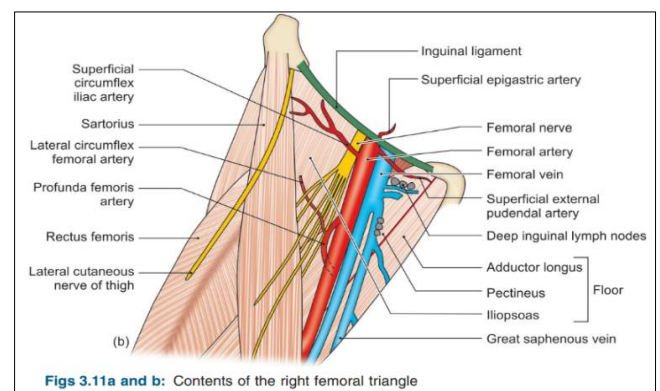


Image 2^[12]

Marmas are formed by congruence of 5 factors. Those as per *Lohitaksha Marma* in lower limb are as follows;

1. *Mansa* - Pectineus, Adductor longus, Psoas major, Iliacus
2. *Sira* - Femoral artery and its branches

3. *Snayu* - Femoral nerve, nerve to the pectineus, femoral branch of genitofemoral nerve, lateral cutaneous nerve of thigh.
4. *Asthi* - Femur
5. *Sandhi* - Closer to hip joint

As these locations seems to be highly vascular and also shows involvement of nerves, can be concluded that the injury to these structures can lead to loss of blood and ultimately can lead to the deformities or paralysis of limbs.

According to commentator of Sushruta Samhita Dr. Ghanekar, at the place of *Lohitaksha Marma* following structures are involved in *Urdhvshakha* - axillary vessels and axillary nerve of upper limb and in *Adhoshakha* - femoral vessels and femoral nerve. Injury to *Lohitaksha Marma* of upper limb causes *Pakshaghat* and *Bahushosh*. Injury to *Lohitaksha Marma* of lower limb causes *Pakshaghat* and *Sakthishosh*.^[13]

Also, the injury effect of *Lohitaksha Marma* is mentioned as there will be *Marana* due to *Rakta Kshaya*. As the structures have large arteries associated it can be explained and concluded that injury to these can cause death.

The term *Lohitaksha* is made of *Lohita* + *Aksha*. These terms can be explained as *Lohita* has correspondence with *Rakta* and '*Aksha*' is derived from '*Kshee Dhatu*' i.e., '*Ksheeksheeyate*' means loss/deterioration. In the term *Aksha*, letter 'A' is joined as *Upasarga*, so the meaning of word *Aksha* is "excessive." Eventually the meaning of word *Lohitaksha* is taken as excessive bleeding.^[14] Excessive bleeding as mentioned earlier can be explained by the anatomical vascular structures present at the site of *Marma*.

Rakta is important factor of *Sharir*. It is included in *Dashpranayatan*^[15] where *Pran* resides. So, loss of *Rakta* ultimately causes loss of *Prana* or death. *Rakta* is considered as *Jeevan* so one should protect *Rakta Dhatu*, is mentioned in *Sushrut Sanhita*. As the structures present corresponding to the *Lohitaksha Marma* are axillary and femoral vessels, injury to these vessels will lead to excessive loss of blood, resulting

into haemorrhagic shock, which will lead eventually to *Marana*. So is the *Viddha Lakshana* of the *Lohitaksha Marma*. So, despite of considering *Lohitaksha Marma* as *Vaikalyakar Marma* its injury can lead to *Marana*.

The *Pakshaghat* may be caused by the ischemia or due to the injury of the cords and branches of the brachial plexus/femoral nerve. Injury to these nervous tissues will cause the *Vikalangata* making the *Marma* as *Vaikalyakar Marma*.

CONCLUSION

Lohitaksha Marma is considered as *Sira Marma* and *Vaikalyakar Marma*. According to the explained structures, in upper limb the structures associated with the *Marma* are the axillary artery, axillary vein and chords and branches (median, ulnar, radial nerves) of the brachial plexus and in lower limb the structures are femoral artery, femoral vein and femoral nerve. These are the large and chief vessels and nerves of limb; hence these structures can cause severe blood loss on injury leading to the paralysis and death which are the mentioned *Viddhalakshanas* of *Lohitaksha Marma*. The consequences of injury to the structures associated with *Lohitaksha Marma* seem to be equivalent to the injury effects (*Viddha Lakshan*) of the *Lohitaksha Marma* mentioned in the texts.

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