A Critical Review of *Lohitaksha Marma* and its Clinical Consideration

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Abstract

The term '*Marma'* literary means the sense of vital parts of the body. *Ayurveda* believes that *Marmas* are the sites or vulnerable parts or areas of body, where *Prana* (life) resides. Any trauma on these sites may cause exit of *Prana* or severe loss of vitality to a particular organ / system or the body as a whole, which is the main cause of death. Therefore study of the science of *Marma* is clinically very important for all medical practitioners to save the lives of the patients and to affect the vitality of a particular organ / system.

The term *Lohitaksha* means red eye area denoting the importance of blood vessel in this region. It is *Vaikalyakara Marma* and situated above the *Bahvi Marma* and below the *Kaksha Sandhi* (shoulder joint), at the root of upper limb. The measurement is half *Angula*, structurally it is a *Sira* (vessels) *Marma*. Any injury or trauma at this *Marma* site causes death due to blood loss and paralysis. As per the modern anatomy any injury near the axilla damages axillary vessels and nerves which lead to atrophy of the upper limb and profuse bleeding leads to death. Injury to axillary nerve & musculocutaneous nerve causes paralysis and a sensory deficit.

This paper aims to explore a scientific & surgical guideline of *Lohitaksha Marma* and to create a better understanding of *Lohitaksha Marma* among students, surgeons, health care providers & consumers.

Keywords: *Marma,* Axillary nerve, Brachial plexus, Paralysis

Introduction:

Ayurvedic Acharyas have described one hundred seven *Marma* areas in our body. Knowledge of *Marmas* can make the person capable to protect themselves physically, as well as prevent them from injury and diseases. Science of *Marma* is also a part of the Marshal Art and science[1].

The science of *Vaikalyakara Marma* is an ancient surgical anatomy of orthopaedic surgery and neurosurgery. *Marma* science has importance with sports science and military science. *Acharya Sushruta* quoted that knowledge of *Marma* are the half of the knowledge of surgery[2].

In the upper limb *Lohitaksha Marma* is in the axilla and can be identified as axillary artery, axillary vein and nerves. Trauma on this *Marma* causes *Lohitkshaya Marana* (death due to blood loss) and *Pakshaghata* (Paralysis)[3]. Area of this *Marma* is half *Angula*[4]. Structurally it is a *Sira Marma*[5].

Aim and objects

1. To explore the concerned literature of *Lohitaksha Marma,* available in *Ayurveda,* modern text books, national and international journals and e-books.
2. List of neurovascular structure found in the *Lohitaksha Marma* on the basis of *Samhitas* and commentators.
3. To analyze our concepts and clinical consideration of *Lohitaksha Marma*.

Lohitaksha Marma

Surface Anatomy

Acharya Sushruta has described the location of *Lohitaksha Marma* above the *Bahvi Marma* and below the shoulder joint i.e at the base of the arm[3].

Considering the facts said by *Acharya Sushruta* and correlating it with the modern medical science, the exact location of *Lohitaksha Marma* lies at the medial side of surgical neck of the humerus close to the insertion of pectoralis major muscle.

Structural Anatomy

Acharya Sushruta described the structure of *Lohitaksha Marma* as *Sira Marma*[5].

As per the surface anatomy discussed above it is clear that vessels and nerve are in abundance at the exact location of *Lohitaksha Marma*. Axillary artery, axillary vein, axillary

nerve and branches of cord of brachial plexus lies in the close scenario of this *Marma*. As axillary artery is divided into three parts by pectoralis minor muscle, in the area of *Lohitaksha Marma* third part of axillary artery and its branches i.e. Subscapular artery, Anterior circumflex humeral artery, Posterior circumflex humeral artery is present.

So, the version of *Acharya Sushruta* is reliable and supported by the modern anatomy.

Neurovascular structures

a. Axillary vessels and nerve
b. Brachial artery
c. Musculocutaneous nerve
d. Median nerve
e. Ulnar nerve

According to Dr. Patil the brachial artery, axillary vein and brachial plexus at the lateral border of pectoralis major, should be considered in this *Marma*[6].

Injury results

Acharya Sushruta opines that an injury at this *Marma* causes death due to blood loss/hemorrhage and Paralysis[3].

Death due to blood loss/hemorrhage-

Trauma near the axilla damages axillary vessels and nerves leading to atrophy of the limb and profuse bleeding leads to death.

Paralysis-

In upper limb, injury to axillary nerve & musculocutaneous nerve causes paralysis and a sensory deficit[7].

After overlooking the entire description of *Lohitaksha Marma* there are some important points which is worth to be noticed. *Acharya Sushruta* has described total 44 *Vaikalyakara Marma* and *Lohitaksha* is one among them[8]. *Vaikalyakara Marma* causes only deformity but not

death as it is predominant of *Soma Guna*[9], but while describing the injury results of *Lohitaksha Marma,* death due to loss of blood i.e hemorrhage has been mentioned by *Acharya Sushruta.*

This really explores the keen vision of *Acharya Sushruta.* In *Sushruta Sharirsthana 6/23* it has been clearly mentioned that *Vaikalyakara Marma* sometimes cause even death when these are greatly injured[10].

Clinical consideration:

At this *Marma,* the predominant anatomical constituent is axillary artery accompanied with axillary vein, musculo-cutaneous nerve, median nerve and ulnar nerve. An injury damaging nerves alone may cause paralysis. On the other hand with the implication of axillary artery with nerves may cause wasting too. Fractures of the upper end of the humerus may damage the axillary nerve and circumflex humeral artery. This may cause to a partial paralysis and partial wasting.

In upper limb injury to cords of brachial plexus causes paralysis of biceps, and coracobrachialis. Both muscles are supplied by musculo-cutaneous nerve. There is sensory loss in the radial side of forearm and loss of flexion of forearm, claw hand and sensory loss on the ulnar side of forearm and hand[11].

Compression of the Axillary Artery

The axillary artery can be compressed against humerus due to injury from bullet or stab wound. In the case of profuse bleeding it can be compressed against humerus and bleeding can be stop[12,13].

Arterial Anastomoses around the Scapula

Anastomosis around scapula is helpful in collateral circulation in the case of injury or blockage or stenosis of subclavian or axillary artery. Stenosis will result in atherosclerotic lesion that cause slow blood flow. So through several anastomosis with suprscapular artery, transverse cervical artery and intercostal arteries. That's why injury at this *Marma* point will not lead to dead so it is *Vaikalykara* type of *Marma*.

In the case of slow occlusion of the axillary artery due to disease or trauma starts sufficient collateral circulation which helps to prevent ischemia. But sudden occlusions are usually unable start adequate collateral circulation which will result inadequate supply of blood to the arm, forearm, and hand. The potential collateral circulations are present proximal to the shoulder joint and distal to the elbow joint, surgical ligation between subscapular artery and the deep artery of the arm of the axillary artery will hamper the blood supply to the arm due to inadequate collateral circulation[12,13].

Aneurysm of the Axillary Artery

Aneurysm of the first part of the axillary artery will compress the brachial plexus especially trunks which will lead to pain and loss of sensation in the regions supplied by the compressed nerves. It usually occurs in the baseball pitchers because of their rapid and forceful arm movements[12,13].

Injuries to the Axillary Vein

Any trauma in the area of the axilla often involves the axillary vein as its size is large and exposed position. In fully abducted arm, the axillary vein lies anteriorly to the axillary artery. Trauma at proximal part of the axillary vein is particularly dangerous because of profuse bleeding and risk of producing air emboli (air bubbles) in the blood[12,13].

Dissection of the Axillary Lymph Nodes

In the dissection and surgery of axillary node there is risk of injury of two nerves i.e long thoracic nerve to the serratus anterior and thoracodorsal nerve to the latissimus dorsi. If thoracodorsal nerve is cut, medial rotation and adduction of the arm are weakened, but deformity does not result.

In the case of malignancy around this nerve, sometimes the nerve has to be sacrificed as the nodes are resected to increase the likelihood of complete removal of all malignant cells[12,13].

Casal, D. et al. (2017) stated in his research paper presents a rare clinical condition which is increasing in present scenario. The vascular lesion associated with brachial plexus lesion in a

conscious patient. This clinical case requires a thorough knowledge of the effected region for a prompt diagnosis.

Thus it will help in vascular damage repair but also nerves involved, which is really of major risk and plays major role to save the life and prevent from major deformity and disability of the patient. So, this case clears that it is a vulnerable area which anatomy should be thoroughly known in an emergency clinical setting[14].

Kedev, S. et al. (2014) said in his research paper that recent advancement in research regarding treatment of choice like as pertaining to percutaneous endovascular interventions, angioplasty and stenting of axillary artery lesions. These have less complication and mortality rates than surgical intervention. He presents a case of axillary artery chronic total occlusion (CTO) with dual etiology (atherosclerotic and radiation induced), which was well treated by stent angioplasty. They have used right radial retrograde approach with contralateral injections from left radial catheter[15].

Conclusion

So, by above description it is clear that vessels and nerve both are the anatomical content of this *Marma*. Axillary vessels, axillary nerve and branches of cord of brachial plexus may be accounted the real contents of this *Marma*. Death due to profuse bleeding is due to laceration of the blood vessels and paralysis of whole arm is due to injury of branches of cord of brachial plexus.

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