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SCIENTIFIC STUDY ON APSTAMBH MARMA

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ABSTRACT

Marma (vital point of the body) science is a very important part of *Ayurveda*. The concept of *Marma* was given by all Acharyas. *Marma* is the seat of life (prana- the vital force of life) present, and injury to this site may lead to severe pain, disability, loss of function, loss of sensation and death. *Marma* of the body is of a total 107 in number. Depending upon effect of injury, *Marma* is of five types like *Sadyopranahara, Kalantara pranhara, Vishlyaghna, Vaikalyakara and Rujakara Marma*. which structurally divided into *Mamsa* (muscle), *Sira* (artery/vein), *Snayu* (ligament), *Asthi* (bone) and *Sandhi* (joint). Vaghbhata also mentioned Dhamni structurally. *Apstambh marma* is placed under the *Sira marma* by Acharya *Sushrut* and *Dhamni marma* by Acharya Vaghbhata. There are two in several *Apstambh Marma* lies in the chest region in both sides of the sternum, but their exact location is not mentioned by Acharyas as *Shushrut, Charak, Vagbhat, Sharangdhar, Dalhana, Bhel* or others. A detailed and clear description of the position of *Apstambh marma* in the body is still not explored.

Keywords: *Kalantar Pranhara Marma, Apstambh Marma*, Phrenic nerve, Internal thoracic artery, Internal thoracic vein, Diaphragm.

INTRODUCTION

Marma is an important chapter as "*pratyekmarm nirdesham shariram*" in *Sharir sthan 6th chapter of Sushrut Samhita* of Ayurveda science. Anatomically *Marma* point is defined as the site where mamsa (muscles), sira (vein/artery), snayu (ligament), asthi (bone) and sandhi (Joints) meet together.[1] *Marma* is vital region/organ of the body. *''Saptottaram marmashatam shariram''* | *(su. sh. 6/3)* Acharya *Shushrut* and other Acharya's have identified 107 *marma* in the anterior, posterior and lateral aspects of the human body.[2] *''Mamani nam Mamsa Shira Snayu Asthi Sandhi sannipata, Teshu swabhawat ev vishesha pranah tisthanti''! (Su. Sh.—6/16) Marma's* are important vital point, where the seats of life(prana) present and conglomeration of *Mamsa* (muscle), *Sira* (vein/artery), *Snayu* (ligament), *Asthi* (bone) and *Sandhi* (joints).[3] *''Marmani shalyavishayardhamudahranti yesmaatchch marmsu hate n bhavanti sadyah''.* | (su.sh. —6/35) Any injury to these parts may lead to pain to death. Important play in surgery, it is called shalyardha.[4]The concept of *Marma* is important in the clinical and surgical point of view. Acharaya Charak said that the *marmas* are vital parts of the body where *Pranas /Chetana* lies .[5]

Vagbhat said that the *Marma* is a point where the application of pressure shows pain and abnormal pulsation.[6]

APSTAMBH MARMA

'Ubhaytrourso naadyo vatvahe Apstambhau naam, tatar Vatpurnakosthata kashswashabhayam cha marnam'.! (su.sh. —6/26) *Apstambha marma* is considered under the *urogata marma* (vital point of chest region) located in the front of chest one on either side of the midline. Injury of *Apstambh Marma* causes gradual death. Injury of *Apstambh Marma* causes *vata Purna koshthta* (chest cavity or thoracic cavity filled with vata or excessive air), *kalash* (cough) and *shwash* (dyspnoea, breathlessness) eventually leading to death[7]. *Apstambha marma* is predominantly made up of *siras* (blood vessels). *Apstambha is Kalantar pranhara marma*.

AIM: Detailed study of *Apstambh marma* w.r.t. Modern Anatomy respectively.

OBJECTIVE

- Structural exploration of *Apstambh marma* by Acharya *Sushrut* and modern view.
- Observation and Analysis of the resultants obtained from *Marmabhigata of Apstambh marma*.
- To observe the position of *Apstambh marma*.

RESULT

The result of this study is useful to understand the ayurvedic concept of *marma* described in various ayurvedic literature. Anatomically position and importance of *Apstambh marma* in respect to the modern view.

DISCUSSION

Apstambha Marma are two in number. Apstambh *Marma* is located in the *Madhyasharirgat* lies one on either side of the midline of the chest region in the body. Apstambh *Marma is Kalantar Pranhar Marma. Apstambh Marma* is *Dhamni Marma* (according to *Vagbhat*) and *Sira Marma* (according to *Sushrut*). Apstambh *Marma* is dimensionally ½ *Angul praman*. Location of *Apstambh Marma* is not mentioned by Acharya's like *Sushrut, **Charak**, Vagbhat, Sharangdhar* and so on, but their position said *urogata* by all.

But Dr Thatte tries to decipher the position of *Apstambh marma* in the body of the chest region. Dr Thatte in his book quotes the position of *Apstambh marma* as primary bronchus on both sides of the midline of the chest region in the body. The position of the right primary bronchus is 25 degrees from the midline of the body and the left primary bronchus is 45 degrees from the midline of the body. Right primary bronchus and left primary bronchus are both structures are at any point their position are not the same. The difference in position of primary bronchus

on both sides of the midline of the body. So, the position of *Apstambh Marma* is also different on both sides from the midline of the body which is not correct because *Marma* position on both sides of the midline of the body will be the same. The position of *Apstambh Marma* should be posterosuperior costal cartilage **of** the 2nd rib. Here the position of *Apstambha Marma* is equally present on either side of the midline of the body. At this site Phrenic nerve, Internal thoracic artery, Internal thoracic vein passes downwardly. Below this 2nd rib phrenic nerve does not pass on both sides of the midline of the body but the internal thoracic artery and internal thoracic vein pass downwardly on both sides of the midline on equidistance of either side of the body. So, the position of internal thoracic artery and internal thoracic vein whatsoever on sternum both sides. Also, they do not receive direct blood to the diaphragm but their branches supply to the diaphragm muscle. The internal thoracic artery and Internal thoracic vein are four in number, two on both sides and present in the chest region. Thus, by the above discussion, it is very clear that both structures like the internal thoracic artery and internal thoracic vein will not be the *Apstambh Marma*. The phrenic nerve is a peripheral nerve that originates from the neural crest cells and is derived from the neural plate in an embryonic stage. Neurulation, or the development of the neural plate, begins after the third week of fertilization. At weeks 5 through 6, the septum transversum, forming the thoracic diaphragm, descends from the cervical vertebrae to the thoracolumbar vertebrae. The phrenic nerve descends along with the septum transversum, carrying innervation from the ventral rami from C3 through C5. The phrenic nerve originates mainly from the 4th cervical nerve, but also receives contributions from the 3rd and 5th cervical nerves (C3-C5) in humans. Thus, the phrenic nerve receives innervation from the parts of both the cervical plexus and the brachial plexus of nerves The phrenic nerve is a bilateral, mixed nerve that originates from the cervical nerves in the neck and descends through the thorax to innervate the diaphragm. The phrenic nerve is among the most important nerves in the body due to its role in respiration. It is the only source of motor innervation to the diaphragm and therefore plays a crucial role in breathing. The phrenic nerve originates from the anterior rami of the C3 through C5 nerve roots and consists of motor, sensory, and sympathetic nerve fibres. The phrenic nerve traverses the neck, heart, and lungs to reach the diaphragm in the thorax, the right and left phrenic nerve will continue to descend anteriorly to the root of the lung and between the mediastinal surface of the parietal pleura and fibrous pericardium. It provides complete motor innervation to the diaphragm and sensation to the central tendon aspect of the diaphragm. The left phrenic nerve innervates the left diaphragmatic dome, and the right phrenic nerve innervates the right diaphragmatic dome, with the majority of nerve branches occurring on the inferior aspect of the diaphragm. The motor innervation activation will cause the diaphragm to contract with inspiration, resulting in a flattened diaphragm and increased intrapleural space. During exhalation, the diaphragm relaxes and returns to the dual dome shape. The phrenic nerve also provides touch and pain sensory innervation to the mediastinal pleura and the pericardium in addition to the intercostal nerves.

OVERVIEW

- Nerve roots – anterior rami of C3, C4 and C5.
- Motor function -- innervates the diaphragm.
- Sensory function – innervates the central part of the diaphragm, the pericardium and the mediastinal part of the parietal pleura.

The phrenic nerves provide motor innervation to the diaphragm and work in conjunction with secondary respiratory muscles (trapezius, pectoralis major, pectoralis minor, intercostals and sternocleidomastoid) to allow respiration. In a small number of people, there may be an accessory branch of the phrenic nerve. An accessory phrenic nerve will follow the true phrenic nerve down its course to the diaphragm but often terminates at the pericardium. This variation will be located laterally and posteriorly to the main phrenic nerve and anteriorly to the subclavian vein. This variant is mostly in C5 contribution and will branch off proximally at the root of the neck to provide motor

innervation to the subclavius muscle. The phrenic nerve directly supplies to the diaphragm which is the primary breathing muscle on both sides of the midline of the body. Diaphragm muscle constricts during inspiration result as lungs volume increases and air-filled up the vacant space in the lung. Diaphragm muscle expands during expiration resulting in lungs volume decreasing and air being expelled out from the lung. Trauma /injury at the posterosuperior costal cartilage of the 2nd rib point may paralyse the phrenic nerve resulting in paralysis of the diaphragm. Related side of injury hampered proper function of the diaphragm may cause to shortness of breath and develops *vata purna koshthta* (pneumothorax). To compensate for the oxygen demand more and more respiration increases and develop *kash* (cough) and *shwas* (dyspnoea, breathlessness) eventually leading to death. Phrenic nerve palsy is most commonly caused by compression or invasion of the nerve by a neoplasm. Other causes include trauma (natural or surgical), phrenic "frostbite" after cardiac surgery, herpes zoster infection, and cervical spondylosis. Due to injury over the phrenic nerve, it may paralyse and thus the diaphragm will not properly work in expiration and inspiration. Due to contraction of the diaphragm volume increases and inspiration takes place but due to paralysis of the phrenic nerve diaphragm will not relax and thus the expiration will be weak resulting in a pneumothorax. This condition may be correlated with *vatapurnakosthta* (pneumothorax). If the internal thoracic artery and internal thoracic vein are considered as *apstambh marma* in both sides of the sternum then its number should be considered are four. The only phrenic nerve is present in both sides of the sternum in a single number at posterosuperior costal cartilage of the 2nd rib.

CONCLUSION

With the above anatomical description, *Apstambh marma* should be considered as a phrenic nerve. Anatomically it is more acceptable due to its position. Apstambh *marma* is two in number present on both sides of the sternum in the midline of the body. Its position is the posterosuperior costochondral part of the 2nd rib on both sides of the sternum. Trauma/injury on a phrenic nerve by any reason causes *vatpurnakoshthta* (pneumothorax), kaash (cough), *Swash* (dyspnoea, breathlessness) and finally death. It will be helpful in the management or prognosis of clinical and various surgical methods.

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