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## A Comprehensive Understanding of *Vidhura Marma*.

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### ABSTRACT:

The concept of *Marma* is one of the unique principle mentioned in ancient Ayurvedic texts. *Marmaisvital* area in the body where there is conglomeration of *Mamsa*, *Sira*, *Snayu*, *Asthi* and *Sandhi*. In these area *Prana* resides specifically and is more vulnerable. These generate the symptoms from excruciating pain to fatal effect when exposed to trauma. *Acharya*'shave mentioned 107 such vital areas in the body. *Vidhura Marma* is one among them, present in the head region, postero-inferior to the Ear within half angula dimension. It is a *Vaikalyakara Marma* and on injury leads to *Baadhirya* (Hearing impairment). Knowledge of *Marma* has said to cover half of the jurisdiction of *Shalya Tantra*. Hence, clear knowledge of *Marma* is very important in clinical field in preventing the complications during the surgical and Para surgical procedures. Details are collected from ayurvedic texts and published papers aiming to provide a comprehensive overview on *Vidhura Marma*.

**Keywords:** *Vidhura Marma*, *Baadhirya*, *Vaikalyakara*, Hearing impairment.

### INTRODUCTION

Numerous scientific concepts of Ayurveda need detailed scrutiny to assess their utility in the field of science. The concept of *Marma* is one of the unique principle of Ayurveda that stands at equal importance in the clinical field in modern era. The knowledge of *Marma* was evolved by practical use of weapons for hitting the enemy in ancient warfare and in hunting wild animals, aiming at specific area of the body where great damage is achieved even by less effort. Such vulnerable spots in the body, identified during ancient times were called as *Marma*.<sup>1</sup> *Acharya Sushruta* has elaborately mentioned 107 *Marma*, along with their location, dimension, predominant structures, effect of injury in the body. *Marmais* confluence area of *Mamsa*,

*Sira*, *Snayu*, *Asthi* and *Sandhi* in the body where specially *Prana* resides by nature.<sup>2</sup> Considering the origin and the practical utility of 107 *Marma*, *Acharya Charaka* has emphasized more on *Trimarma*, that includes *Basti*, *Hridaya* and *Shira*. These vital areas in the body when exposed to trauma generate symptoms from excruciating pain to fatal effect.<sup>3</sup> The science of *Marma* and its practical application, had fallen long into oblivion, like many other branches of ayurvedic literature.

*Vidhura Marma* is one such *Marma*, present in head and neck region and *Vaikalyakara* (functional loss) in nature. Person suffers from hearing impairment, if there is any injury to this *Marma*. The knowledge of *Marma* is very important in prevention of complications during the



procedures of *Agni Karma*, *Kshara karma* and *Shastra karma*. In case of trauma, it is useful in understanding the possible anatomical structure affected and deformities which may be produced. *Acharya Sushruta* is of the view that the knowledge of *Marma* covers half of the knowledge of *ShalyaTantra*<sup>4</sup>. Persons injured in such vital spots die immediately; if anyone survives by the treatment of skill of physician, he is sure to suffer from some or the other related disorder/deformities.<sup>2</sup>

### Review of Literature related to *Vidhura Marma*

#### **Etymological description:**

*Vidhura* means distress, troubled, afflicted, overwhelmed with grief, miserable, separation, devoid, deprived/destitute of, free from, adverse, hostile.<sup>4,5,6</sup>

#### **Description in ancient literatures**

*Vidhura marma* is one among the *Vaikalyakara Marmapresent* in *Urdhwajatru* (Head and Neck) *Pradesha* (Region). The opinion of *Acharyagana* regarding the identification of structural entity of *Vidhura Marma* differs. The predominant structural entity present in *Vidhura marma* point is *Snayu* as per *Acharya Sushruta*, *Dhamani* as per *Acharya Vagbhata*. Hence there is a need to probe into the matter for drawing a justification for structural entity of *Vidhura Marma* by reviewing the literature. **Table 1 Classification of *Vidhura Marma* based on various types of classification**

#### **Location of *Vidhura marma*-**

As per Classics, *Vidhura marma* is situated below and behind the ear (posteroinferior to the earlobe)<sup>7,8</sup>

**Dimension-** It is half *Angula* in *Pramana*.

**Injury effect-**Injury to *Vidhura Marma* leads to *Baadhirya* (Hearing loss), as per both *Acharya Sushruta* and *Vagbhata*

#### **As per recent authors:**

According to Dr Pathak and Dr Awasthi, structures traced at the *Vidhura marma* point (below and behind the Ear) were Posterior auricular artery, a branch of external carotid artery starting from the inferior end and passing upwards behind the ear along with stylomastoid artery. This is considered as *Dhamani* component and at the same time involvement to Vestibulo-cochlear nerve through the tympanic membrane considered as *Snayu* entity. They have described that damage to vascular structure like posterior

auricular artery and nervous structures like the tympanic membrane along with partial or complete damage of vestibulocochlear nerve leads to extra auricular or intra auricular bleeding and damage to the affected nervous tissue, respectively causing deafness due to *Vidura marma* trauma. Dr.Ghanekar also holds the same opinion in this regard .<sup>9</sup>Dr. Sachin Sharma et al. opines that stylomastoid artery, which is the branch of posterior auricular artery is considered as *Dhamani* component and has more significance in causing hearing loss than Facial nerve which is considered as *Snayu* component<sup>10</sup>

#### **As per Contemporary Science:**

Important anatomical structures present in posterior auricular region are

Mastoid process, styloid process of temporal bone, temporalis muscle, sternocleidomastoid muscle, facial nerve and its branches, vestibulocochlear nerve and its branches, tympanic plexus, structures of middle ear, great auricular nerve, posterior auricular artery and its branches and tympanic membrane.

#### **Mechanism of hearing<sup>11</sup>:**

Any vibrating object causes waves of compression and rarefaction and can produce sound. The sound signals from the environment are collected by the Pinna, passthrough external auditory canal, and strikes the tympanic membrane. Vibrations of the tympanic membrane are transmitted to footplate of stapes through a chain of ossicles coupled to tympanic membrane. Movements of footplate of stapes causes pressure changes in labyrinthine fluid which move the basilar membrane. This stimulates the hair cells of the organ of corti. It is these hair cells which act as transducers and convert the mechanical energy into electrical impulses which travel along the auditory nerve. The mechanism of hearing can be broadly divided into:

- 1.Mechanical conduction of sound (conductive apparatus)
- 2.Transduction of mechanical energy into electrical impulses (sensory system of cochlea)
- 3.Conduction of the electrical impulses to the brain (neural pathways)

In conduction of sound waves from air conducted to travel through the cochlear fluid, there exist impedance offered by the fluid medium, Hence, Nature has compensated for this loss of sound energy by interposing the middle ear which converts sound of greater amplitude but lesser force, to that of lesser amplitude and greater force. This function of middle ear is called impedance matching mechanism or the transformer action.

It is accomplished by:

- a. Lever action of ossicles.
- b. Hydraulic action of tympanic membrane.
- c. Curved membrane effect.

When oval window is receiving waves of compression, round window is at the phase of rarefaction. If sound waves where to strike both the windows simultaneously, they will cancel each other's effect with no movement of the perilymph and no hearing. This acoustic separation of the windows is achieved by the presence of intact tympanic membrane and a cushion of air in middle ear around the round window. Phase difference between the windows contributes 4db when tympanic membrane is intact.

Transduction of mechanical energy into electrical impulses: Movements of stapes footplate, transmitted to cochlear fluids, move the basilar membrane, setting up shearing force between the tectorial membrane and the hair cells. The distortion of hair cells gives rise to cochlear microphonics which triggers the nerve impulse.

A sound wave, depending on its frequency, reaches maximum amplitude on a particular place on the basilar membrane and stimulates that segment (traveling wave theory of Von Bekesey). Higher frequencies are represented in basal turn of cochlea and progressively lower ones towards the apex.

Neural pathways: Hair cells get innervations from the bipolar cells of spiral ganglion. Central axons of these cells collect to form cochlear nerve which goes to ventral and dorsal cochlear nuclei. From there, both crossed and uncrossed fibers travel to the superior olivary nucleus, lateralle mniscus, inferior olliculus, and medial geniculate body and finally reach the auditory cortex of the temporal lobe.

Four types of potential shave been recorded: three from cochlea and one from CNVIII fibres. They are end ocochlear potential, cochlear microphonics, summing potentials are from cochlea and compound action potential from nerve fibres.

#### **Description on hearing loss<sup>12,13</sup>**

Hearing loss or hearing impairment is a partial or entire inability to perceive sounds. It can be partial or total, sudden or gradual resulting in hearing conversational speech or loud sounds in difficulty. It can be unilateral or bilateral.

#### **Degree of hearing loss**

It refers to this verity of the loss. It is based on how loud

the sound can be heard. decibels(dB) describe loudness.

#### **Types of hearing loss**

##### **Conductive hearing loss**

It is caused by anything that interferes with transmission of sound from outer to inner ear. The lesion may lie in the external ear and tympanic membrane, middle ear or ossicles upto stapedio vestibular joint.

##### **Mixed hearing loss**

In this type of hearing loss both conductive and sensorineural deafness are present in the same ear. There is air-bone gap indicating conductive element, and impairment of bone conduction indicating sensorineural loss. Mixed hearing loss is seen in some cases of otosclerosis and chronic suppurative otitis media.

##### **Sensory neural hearing loss**

Sensory neural hearing loss(SNHL) results from lesions of the cochlea, VIIIth nerve or central auditory pathways. It may be present at birth(congenital)or start later in life

## **DISCUSSION**

*Vidhuramarma* lies below and behind the Ear within half *angula* dimension. According to *Acharya Sushruta* it is categorized under *Snayu marma* and *Dhamani Marma* as per *Acharya Vagbhata*.As per the classics the term *snayu* is described as “*Navasnayushatani mastulungamoolani*”<sup>14</sup>that which emerges from *Mastulunga.Prasarana* and *Aakunchana* of *Anga* are mentioned has the functions of the *Vruttasnayu/Kandara*<sup>15</sup>.In *Vatavyadhi* like *Grudhrasi*, *Vishwachi*, *Khalli*, *Akshepaka*, affected part is *Kandara*<sup>16</sup>. Based on above references *Snayucan* be considered as Neuroconnective tissue entity which conducts impulses from brain to structures for carrying their respective functions. As per the classics, the term *Dhamani* means-*DhmanatpooranatbahyenRasadina Ityarthaha*<sup>17</sup>- *Dhamani* starts pulsating when they get filled with nutrient fluid. Arteries can be considered as *Dhamani* because of its pulsating nature.

By reviewing the literature,with in theradiance of *Vidhura Marma* structures related are tympanic membrane, vestibulo-cochlear nerve, Facial nerve, posterior auricular artery, styломastoid artery and branches of external carotid artery, part of Internal carotid artery, Tympanic plexus of nerve entering in to middle ear cavity . Facial nerve trunk and styломastoid branch of posterior auricular artery are

considered as most probable structure, as it lies postero-inferior emerging from stylomastoid foramen to the ear and injury to these structures causes hearing impairment.

### **Facial Nerve Injury Causing Hearing Loss**

Nerve to stapedius, a branch of facial nerve supplies the stapedius muscle which is bipennate and arises from pyramidal eminence and inserts to neck of stapes and draws the stapes laterally with exerting damping effect of sound vibrations to protect the internal ear from loud sounds.

Damage to this nerve causes paralysis of stapedius which results in hyperacusis and hearing loss due to impairment in the function of the ossicular chain, resulting in inefficient conversion of sound waves from air to the fluid medium of the endolymph in the membranous labyrinth.

Cutaneous somato-sensory fibres from concha of auricle are conveyed by facial nerve along with the auricular branch of vagus, damage to this hamper's general sensations from the conchae.

Facial nerve in internal acoustic meatus has a communicating branch with vestibulocochlear near – injury to this may leads to hearing loss. One of the complications of forceps delivery in neonates have high risk of damage to the Facial nerve trunk as it is very superficial. Due to poor pneumatization of the mastoid this may cause hearing loss with other symptoms, when forceps is applied to the Norma lateralis of foetus.<sup>11</sup>

### **Vascular Structures Damage Causing Hearing Loss:**

Stylomastoid artery, branch of posterior auricular artery supplies inner surface of tympanic membrane, stapedius muscle, middle ear cavity, mastoid antrum, mastoid air cells and facial nerve. Injury to this artery, hampers normal blood supply causing impairment in the normal functions of the tympanic membrane and ear ossicles. This causes disturbance in the conduction of sound waves leading to conductive hearing loss. Thus information related to injuries in the area of *Vidhuramarma* (below and behind the ear) highlights its importance that are mentioned in classics.

## **CONCLUSION**

*Vidhura Marma* is one of the *Urdhwajatrugatamarma*, lying below and behind the Ear. As per contemporary science it lies exactly at appoint in the junction between norma lateralis and lateral aspect of neck, anterior to mastoid process in a depression posterior to root ear lobule, *Ardhangula pramana* area lies exactly at opening of

stylomastoid foramen through which the facial nerve emerges. According to *Acharya Sushruta* it is categorised under *Snayu Marma*, which can be related with facial nerve and its branches involved in causing conductive deafness. As per *Acharya Vagbhata*, *Dhamani Marma* is considered as predominant structural entity causing *Baadiry* is related with stylomastoid artery. Hearing is considered as one of important senses of the body. So, it is pertinent to mention that the areas of *Vidhura marma* are advised to protect from any kind of injury from any objects or during the surgery.

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**Table 1 Classification of *Vidhura Marma* based on various types of classification**

<i>Rachananusara</i> (structural)	<i>Shadanganusara</i> (Location)	<i>Parinamanusara</i> (Effect of injury)	<i>Pramananusara</i> (Dimension)	<i>Sankhyanusara</i> (Enumeration)
<i>Snayu</i> ( <i>Sushruta</i> ) <i>Dhamani</i> ( <i>Vagbhata</i> )	<i>Urdhwajatrugata</i> ( <i>Shira</i> )	<i>Vaikalyakara</i>	<i>1/2 Angula</i>	2 in number

**Table 2- Degree of hearing loss.**

Sr.No.	Degree of Hearing loss	Decibels
1	Mild	26-40dB
2	Moderate	41-55dB
3	Moderately Severe	56-70dB
4	Severe	71-91dB
5	Profound	More than 91dB