

Observational study of the VIDHUR MARMA w. s. r. to deafness due to trauma
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Abstract:

Marma's are the vital points in the body which prove to be fatal when subjected to trauma. Detail knowledge of Marma is important from surgical point of view; Deafness is a major public health problem in india and worldwide. Around 63 (6.3%) million people suffers from significant hearing loss in india. The most common causes of traumatic deafness are mild head injury, surgical trauma, slapping on the ear, head injury with fracture of the temporal bone, head neck injury without fracture, foreign bodies insertion as well as removal .

35 patients with deafness due to trauma were selected and were subjected to various Tuning fork tests like Rinni test, Weber test and absolute bone conduction test and were observed for type of deafness and association of vidhur marma.

Audiometric assessment has justified that Vidhur Marmas Vaiklyakara in nature. any injury or trauma to Vidhur Marmaleads to deafness (Karnabadhira).

Keywords: Deafness, Vidhur Marma, Snayu marma, Tympanic membrane

INTRODUCTION:

Ayurveda is an ancient science which deals with health of human being. Ayurvedic science came into light back to Vedic time about 3,000 B.C. Ayurveda made up of words "Ayu" means life and "Veda" means science or knowledge which has its own great and universal platform since Vedic Kalas. The main aim of this system is to protect health of healthy person and to eliminate diseases and dysfunctions of the body.[1]

In all Ayurvedic Samhita as "SharirSthana" is one of the initial chapters which deal with the description of external and internal body features. Our Acharyas have very clearly described this particular aspect. Acharya Sushruta and his commentators are the pioneers. SushrutaSharirSthana has great anatomical importance.[2]

The anatomical description of body is mentioned as *RachanaSharirin Ayurveda*. *Acharya Sushruta* and *Vagbhata* mentioned *Marma* in *SharirSthana*, as “*Maryante Iti Marmani*” means there death or serious damage may occurs after infliction to these vital places.[4] *Marma* is specialty of *RachanaSharir*.

MarmaVigyan was developed as science of war. There are so many references from *Vedas* regarding attack on *Marma Sthanas* of enemies and protecting one's *Marmas* by wearing metallic protectants. *Marma's* are the vital points in the body which prove to be fatal when subjected to trauma. Detail knowledge of *Marma* is important from surgical point of view; surgical procedures like *Agnikarma*, *Ksharkarma* and *Shastrakarma* are used as a part of the surgery. While conducting these surgical procedures the knowledge of *MarmaSthana* is required with proper knowledge of *MarmaSthana* we may perform the procedure without any complications. Therefore the knowledge of *Marmas* is said by *Acharya Sushruta* to be the half knowledge of *ShalyaTantra*. [5]

Marma are the vulnerable anatomical entities on human body. The actual meaning of trauma in *Ayurveda* is *Marma Abhigata*, where any kind of external or internal trauma may produce disease. Trauma means stroke or attack or infliction of injury or damage to body, either internal or external. This can be physical or psychic one. In traumatic condition the knowledge of trauma site, structures involving and deformity identification is necessary. So treatment and surgical procedures both aspect *Marma* study is important.

MarmaVigyan is like an ocean of knowledge, that requires systemic

interpretation of *Ayurveda* as well as modern anatomy with skillful hand in dissection. Then we will enjoy the surfing in this ocean. *Marma* is a tremendous and liveliest subject in *Ayurveda* because when we understand the hidden secret of *Marma* many puzzles unfold itself.

Description of 107 *Marmas* given by all *Acharyas* being classified into five varieties on the basis of structure involved, five on the basis of effect of injury, five on the basis of location of body. As such they are presented 44 *VaikalyakaraMarmas* under which given due to emphasis on the disabilities.

Acharya Sushruta and *Vagbhata* both considered *VidhurMarma* under *Vaikalyakara* category according to trauma. In other classification *Sushruta* has considered it under *SnayuMarma* where as *Vagbhata* considered it *Dhamani Marma* on structural basis. It is two in numbers and is half *Anguli* in measurement. Its *Viddhalakshana* is deafness (*Badhira*). It is located just behind and below to the auricle of the ear. And trauma on it result in deafness. [6]

Deafness is a major public health problem in India and worldwide. Around 63 (6.3%) million people suffers from significant hearing loss in India. And hearing disability is the second most common disability here. [7][8] The most common causes of traumatic deafness are mild head injury, surgical trauma, slapping on the ear, head injury with fracture of the temporal bone, head neck injury without fracture, foreign bodies insertion as well as removal.

Anatomical structure at *VidhurMarma* according to past studies is stylomastoid artery, facial nerve, mastoid air cells, deep auricular artery, ant. tympanic artery, vestibular cochlear nerve, mastoid

portion of temporal bone, posterior auricular artery and veins, tympanic membrane, membranous labyrinth, middle ear and internal ear structure, branches of 8th cranial nerve, posterior auricular vessels and structure emerging out of stylomastoid foramen. There is no clear idea about *VidhurMarma* clinically, so in present study we are doing sincere efforts to elaborate *VidhurMarmaby* observing patients having deafness due to trauma. That will help to exact structure contributing *VidhurMarma* also its extent and nature.

AIM:

To study of the *VidhurMarma* with special reference to Deafness due to trauma.

OBJECTIVES:

1. To study *VidhurMarma* with *Ayurvedic* and Modern aspect.
2. To explore the extent, nature and particular structure of *VidhurMarma* with help of Cadaveric Dissection.
3. To study the relation of *VidhurMarma* with Deafness due to trauma.

MATERIAL AND METHOD:

30 patients with deafness due to trauma were selected and were subjected to various Tuning fork tests like Rinni test, Weber test and absolute bone conduction test and were observed for type of deafness

The inclusion and exclusion criteria were as follows

INCLUSION CRITERIA:

(I) Patients having age between 20 to 50 years, Irrespective of sex, Religion, Socioeconomic status, Co-operative patients.

(II) Pt. Having c/o Deafness due to following causes were included in the study

- a) Mild Head Injury
- b) Surgical trauma
- c) Slapping on the ear
- d) Head injury with fracture of the temporal bone
- e) Head neck injury without fracture
- f) Foreign body insertion as well as removal

EXCLUSION CRITERIA:

- a) Patients with past H/o ear disease.
- b) H/o previous head injury
- c) Noise induced deafness
- d) H/o family suggestive of autoimmune disease and hearing loss.
- e) Toxic deafness
- f) Drug *ototoxicity*
- g) Presbycusis
- h) Syphilis of the ear

Assessment were carried out according to the clinical diagnosis of Deafness with following criteria –

- a) Site of trauma
- b) Nature of trauma
- c) Assessment of parameters (table 1)

ASSESSMENT PARAMETERS -

Sr.No.	Site/ Nature of injury	Rt. Ear	Lt. Ear
1.	<i>Ossicular</i> discontinuity		
2.	Traumatic Perforation		
3.	<i>Haemotympanum</i>		
4.	Nerve injury		
5.	Rupture of the ear drum		
6.	Fracture of the base of skull		
7.	Injury		

Table 1- Assessment Parameters

OBSERVATIONS AND RESULTS:

Total volunteers were subdivided in to 7 ranges of age group i.e. ≤ 20 , 21-25, 26-30, 31-35, 36-40, 41-45, ≥ 46 years. Maximum numbers of volunteers were found in the range of 21-25 years is 10 (28.57%) and minimum numbers of volunteers found in two groups ≤ 20 and 26-30 (8.57%).

out of 35 volunteers 24 (68.57%) volunteers were male and 11 (31.43%) volunteers are female. Maximum

volunteers were found in group of student i.e. 10 (28.57%).

For present complaint variation ,volunteers were subdivided into 6 groups i.e. maximum numbers of 35 (100%) volunteers were suffering from difficulty in hearing, 33 (94.29%) suffering from pain, 14 (40%) suffering from vertigo, 09 (25.71%) suffering from tinnitus, 04 (11.43%) suffering from itching and 03 (8.57%) were suffering from nausea & vomiting. (Fig 1)

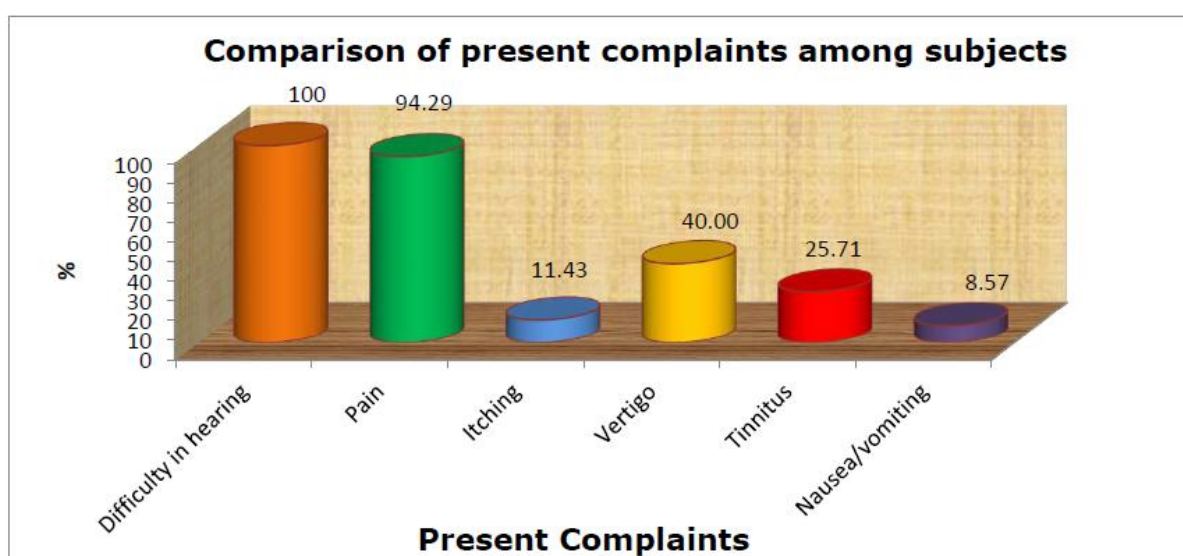


Fig 1. Comparison of present complaint among subjects

Distribution according to Results of Rinne test in Right Ear. Volunteers belonging to negative status were high – 21 (60%) while in left ear test Volunteers belonging to positive status were high – 18 (51.43%). (fig 2 a,b)

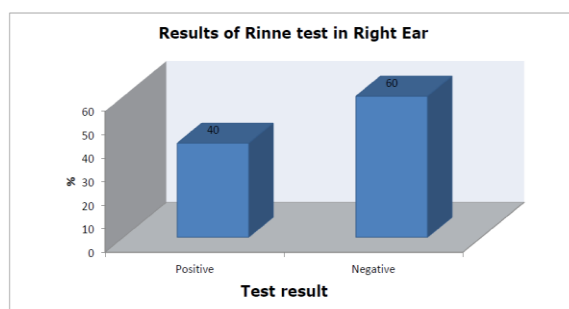


Fig 2 a :Rinne test Right ear

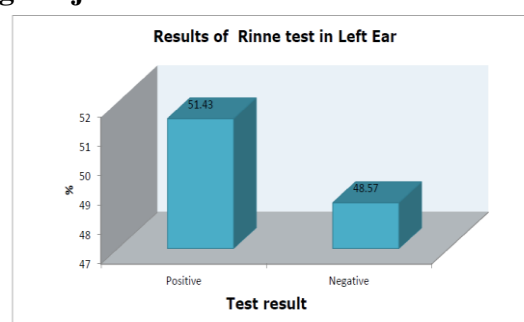


Fig 2 b :Rinne test Left ear

Distribution according to Results of Weber test in Right Ear. normal status were high – 24 (68.58%), lateralised to poorer ear status were found 10 (28.58%) and lateralized to better ear status were found 1 (2.86%). while in left ear the normal status were high – 22 (62.86%),

followed by lateralised to poorer ear status were 8 (22.86%) and followed by lateralized to better ear status were 5 (14.29%).(fig 3a ,3b)

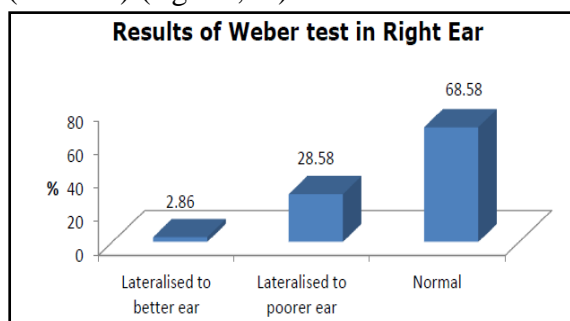


Fig 3 a :Weber test Right ear

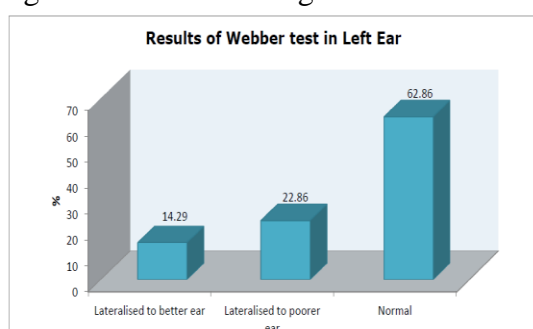


Fig 3 b :Weber test Left ear

Distribution according to Results of Absolute Bone Conduction test in Right Ear. Reduced status were found 5 (14.29%).while in left ear only 1 was found

Distribution according to Severity of deafness among study subjects Volunteers belonging to mild and moderate status were high in both ears 17(48.57%) and severe status were found low in both ears 10 (28.57%).(fig 4)

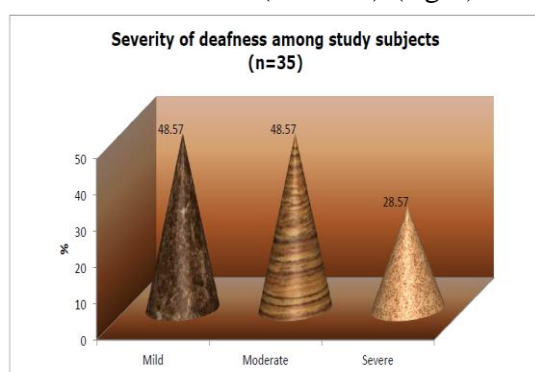


Fig 4. Severity of deafness among study subject

For Comparison of type of deafness in right and left ears total volunteers were subdivided into 3 groups i.e. conductive hearing loss, mixed hearing loss and sensorineural hearing loss. Conductive hearing loss were found high in both ears 18 (51.43%) in right ear and 15 (42.86%) in left ear and as followed by mixed hearing loss found 4 (11.43) in right ear and 3 (8.57%) in left ear and sensorineural hearing loss were observed 3 (8.57%) in right ear and 1 (2.86%) in left ear.(fig 5)

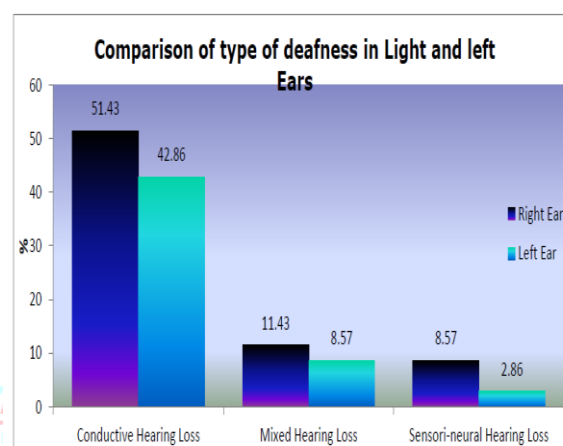


Fig 5. Comparison of type of deafness in right and left Ears

For nature of injury in right ear Volunteers belonging to rupture of the ear drum and traumatic perforation status were found high – 19 (54.29%), ossicular discontinuity were found 14 (40%), fracture of base of skull were found 5 (14.29) and nerve injury and injury to labyrinth were observed 4 (11.13%) While In left ear Volunteers belonging to rupture of the ear drum and traumatic perforation status were high – 13 (37.14%), followed by ossicular discontinuity status are 10 (28.57%), injury to labyrinth were found 1 (2.86%)(fig 6)

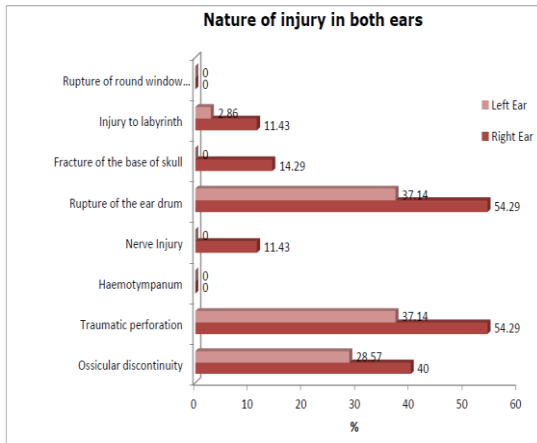


Fig 6 : Nature of Injury in both Ears
For Cause of Trauma in both ears Volunteers belonging to assault were observed high – 19 (54.29%), RTA were found 7 (20%), foreign body status were found 6 (17.14%) and other causes status were observed in 3 (8.57%) volunteers.(Fig. 7)

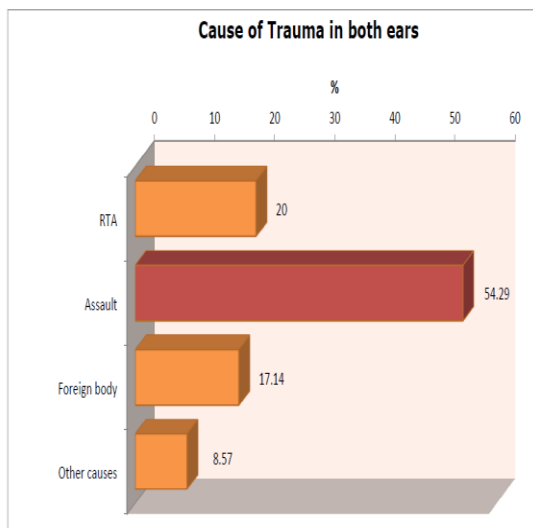


Fig 7: Cause of trauma in both Ears.

DISCUSSION:

The word *Marma* is used in various *Ayurvedic Samhitas* and Indian literature. *Marma* is vulnerable point on the body. The science of traumatological anatomy which was designated as *MarmaSharir*. In *Sanskrit* literature, *Marma* word derived from the *Sanskrit* root 'Mru'. According to *Shabdostom Mahanidhi*, *Marma* means *Jeevsthana*.

Acharya Charaka described in *Trimarmiya Adhyaya* that, injury to any *Marma* causes severe agonising pain because these are the site of *Chetana*. *Acharya Charaka* further observed *Marmasas Madhyam Rogmarg*. *Chakrapani* in his commentary on *Charak Samhita* clarified that *Marma* are the point where *Mansa*, *Sira*, *Snayu*, *Asthi* and *Sandhi* are collectively together. According to *Acharya Sushruta*, *Marmas* is an area where all the five anatomical structures i.e. *Mansa*, *Sira*, *Snayu*, *Asthi* and *Sandhi* are mutually present. In these area *Prana* is concentrate and hence when *Marmas* are injured they produce their respective effects. According to *Dalhana*, *Marmas* is an anatomical point, where if injury occurs, it may leads to death.

According to *Acharya Vagbhata* in *Ashtanga Hridaya*, *Marmas* is that place which has unusual thrombosing and pain on touch. The *Marmas* are so called because they cause death as life totally resides in them. And they are meeting place *Mansa*, *Sira*, *Snayu*, *Asthi* and *Sandhi*. *Arundatta* in his commentary on *Ashtanga Hridaya* described that injury on *Marmas* causes death or death like pain or symptoms.

After analysing the above all definitions we conclude that literally "*Maryanti Iti Marmani*" is true but the classification of *Marma* according to *Parinam bheda* proves that the above definition to has certain limitations because all the *Marmas* like *Vaikalyakara Marma* and *Rujakara Marma* does not cause death so the extended definition of *Marma* can be considered as the vital points on the body surface which are sites of *Prana* and where if any sort of injury occurs it causes pain or severe pain or disability or death. The confluence of *Mansa*, *Sira*, *Snayu*, *Asthi*, *Sandhi* and

Dhamani collectively or two or more than two components can constitute on *Marmapoint*.

All *Samhitakara* agree that there are 107 *Marmas* available on the body surface. So, there is no controversy regarding the enumeration of *Marma*.

Classification of *Marmas* described in various *Ayurvedic* classics has got many different criterias. Charaka has not given any particular classification.

Acharyas classified *Marmas* on the basis of components present in particular *Marma* (*Rachanabheda*). *Acharya Sushruta* classified *Marmas* in five types according to their components present at particular *Marma* i.e. *Mansa*, *Sira*, *Snayu*, *Asthi* and *SandhiMarma*.

In *AshtangaHridaya* *Acharya Vagbhata* predicted sixth group of categorization of *Marma* on the basis of components present at particular *Marma*, as *Dhamani Marma*. These *Marmas* are – 9. *Guda*(1), *Apstambha*(2), *Vidhura*(2) and *Shrungataka*(4).

Acharya Sushruta considered *Guda* as *Mansa Marma*, *Apstambha* as *SiraMarma*, *Vidhura* as *Snayu Marma* and *Shrungataka* as *SiraMarma*. *Acharyas* also classified *Marmas* on the basis of *AnguliPariman*. According to *Acharya Sushruta* the *AnguliParinama* are $\frac{1}{2}$ *Anguli*, 1 *Anguli*, 2 *Anguli*, 3 *Anguli* and 4 *Anguli*. *Vagbhata* accepted *Sushruta* classification of *Marma* according to *AnguliPariman*. But in *Ashtanga Hridaya* *Vagbhata* stated that *Atmapanital* instead of 4 *AnguliParimana*.

Acharyas classified *Marmas* on the basis of their location on body surface (*Shadangabheda*). According to *Acharya Sushruta* and *Acharya Vagbhata* these are *Adhoshakhagata*, *Urdhvasakhagata*,

Urdhvajatrugata, *Ura* and *Udaragata Marmas*.

Acharya classified *Marmas* on the basis of effect on body, due to injury (*Parinambheda*); *Acharya Sushruta* and *Vagbhata* classified *Marmas* according to *Parinambheda* into 5 groups i.e. *SandhyaPranahara*, *KalantaraPranahara*, *Vishlyaghna*, *Vaikalyakara* and *RujakaraMarma*.

Acharya discuss the effect of *Marmabhighata* classification on the basis of prognostic mortality into 5 category. If the trauma to *SandhyaPranaharaMarma*, all the eleven senses are unable to function and brain plus mind does not intellect to perform their functions. If the trauma to *KalantaraPranahara Marma* then there will be *Dhatu-Kshaya* and slowly death occurs due to atrophy. Trauma to *VaikalyakaraMarma* produces severe complications but under the expert investigator or surgeon the person is just obtain deformity. Injury to *Vishalyaghna Marmas* causes same effect stated in his definition i.e. after removal of *Vayu* from *Marma* person leads to death. Trauma to *RujakaraMarma* produces severe agonising pain.

Marmabhighata is consider as two types that endogenous factor i.e. *Doshabhighata* also produces *Marmabhighata* as that of exogenous factor i.e. physical trauma or instrumental trauma. In present days there is no war, but the sources of trauma now a days are road traffic accidents, assaults, surgical trauma and *Doshabhighata* are also types of injuries.

In present study we found rupture of ear drum and traumatic perforation were high. Ear drum means tympanic membrane as *Snayu Marma* (thin fibrous structure) this is stated in the article of Pradiptkumar pal

in critical appraisal of *SiraMarma* with special reference to *Vidhur Marma*.

Tympanic membrane is a vital component of the human ear. It is thin circular layer of tissue. Tympanic membrane is very important part of the organ of hearing; it functions for the reception of the hearing impulse and transfer it to the auditory middle ear ossicles. Tympanic membrane functions through the way of vibration according to the incoming sound waves. Patients with ruptured or absent tympanic membrane have extreme difficulty in hearing and possibly even complete hearing loss. When tympanic membrane rupture by trauma where traumatic perforation automatically found. It may be one or multiple.

According to *Ayurveda* structure of *Snayu* is same as tympanic membrane. Structure of *Snayuis* stated in *Ayurveda* which whitish in colour, thin and fibrous tissue structure.

Acharya Sushruta considered *Vidhur Marma* as *Snayu Marma*. So here we conclude that tympanic membrane as *Snayu Marma*. And tympanic membrane structure is present at site of *VidhurMarmait* is stated in literature. Trauma to tympanic membrane leads to deafness. And also found in observation middle ear structure injured i.e. rupture of tympanic membrane, *ossicular* discontinuity and facial nerve injury. Middle ear are included in regional anatomy of *VidhurMarmait* is given in the literature of *VidhurMarma*. Middle ear also site of *VidhurMarma*. This structure was observed and identified in dissection also. Conductive hearing loss were also found it is occurs in injured middle ear and rupture of tympanic membrane. Rinne test is negative in conductive hearing loss. In this study Rinne

test was found negative. Exogenous trauma was found in study i.e. *Bahya-aaghata*. On the basis of all observations we got positive response for injury or trauma to tympanic membrane or middle ear leads to deafness. So it prove that tympanic membrane with middle Ear structure is site of *Vidhur Marma* and trauma on it leads to deafness.

VidhurMarma is $\frac{1}{2}$ *Anguli* in measurement is justified in our study by dissection. In the dissection it is measured $\frac{1}{2}$ *Anguli*, tympanic membrane to middle ear *ossicles* it is approximately 1cm.

Hence the involvement of anatomical structure of tympanic membrane in 32 and middle ear structure in 28 cases of *Karnabadhira* in our study is justified.

Vaikalyakara nature *VidhurMarma* also justified by audiometric assessment.

In view of *Marmabhighata* the involvement of tympanic membrane in the injury or trauma justifies the structural classification as *Snayu Marma* as stated by *Acharya Sushruta*.

The observations which we got in the study are similar as *Acharya Sushruta* and *Acharya Vagbhata* stated in the *Shloka* i.e. trauma to *VidhurMarma* leads to *Karnabadhira*.

CONCLUSION :

- *Marmas* are the vital points on the body surface. The junction of *Mansa*, *Sira*, *Snayu*, *Asthi* and *Sandhi* collectively or two or more components can constitute *Marma* point. In these areas *Prana* resides and hence when *Marma* are injured they produce their respective effects pain or disability or death.
- It can be firmly concluded that the exact position of *VidhurMarma* is

tympanic membrane with middle ear structure. This place is measure about $\frac{1}{2}$ Anguli in *Parimana*.

- Tympanic membrane with Middle ear structure is site of *VidhurMarma*.
- On the basis of observations, dissection and literature, we conclude that tympanic membrane is consider as *SnayuMarma*.
- Audiometric assessment has justified that *Vidhur Marma* is *Vaiklyakara in nature*. The study firmly concludes that any injury or trauma to *VidhurMarma* leads to deafness (*Karnabadhira*).

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