

## Study of Hriday Marma with special reference to modern anatomy

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### Abstract

Marma points are vital areas in the body described in Ayurvedic and traditional Indian medicine. There are believed to be 107 Marma points distributed throughout the body, with varying degrees of significance. In the ancient practice of Ayurveda, Hriday Marma holds significant prominence as a vital point in the body's energy system. Marma points are pivotal areas where physical and subtle energy pathways intersect, influencing health and well-being. It governs not only cardiac function but also emotional intelligence, compassion, and the ability to form meaningful connections. According to Acharya Charaka and Acharya Sushruta, Hridaya is one of the Koshtanga. According to Charaka, Hridaya is the Moola Sthana for Pranavaha Strotus and Rasavaha strotas. It ejects and receives Rasarakta Dhatu by the help of Vyanavayu. It controls intellectual power and mental activities of human being, by Manas and Sadhakapitta.

**Keywords-** Marma; Hriday; Koshtang; Heart; Trigunas

### 1. Introduction

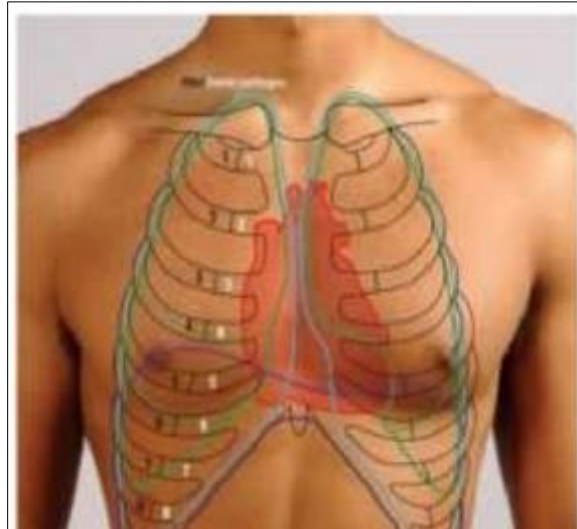
Marmas are certain vital points spread all over the surface of the human body((26) (PDF) *Marma-1*, n.d.). These are the places where the Prana (life force) is said to be situated. Marima, definitions of Marmas, types of Marmas, and symptoms produced after injuries to these Marmas, are described by nearly all Ayurvedic texts(Joshi & Vishvakarma, 2013). Derivation of the term Hridaya is derived from three words: Hr: Haraṇa means the collection of Rasa Rakta from the body. Da: dana means distribution or supply of Rasa Rakta to all the Dhatu of the body. In (ya): ayana means expansion and contraction movements. Thus, the term Hridaya means structure that collects rasa rakta from the body, supply it to all the dhatu of the body and conduct expansion and contraction movements. Hridaya means Heart(Shah et al., 2009). All the life processes depend on the nutrition (Preenana) and oxygen (Jeevana) which they receive through circulation of blood(A CRITICAL REVIEW OF HRIDAYA MARMA SIGNIFICANCE OF, n.d.-a).

### 2. Literature review

स्तनयोर्मध्यमधिष्ठायोरस्यामाशयद्वारं सत्त्वरजस्तमसामधिष्ठानं हृदयं।

Hridaya marma is situated between two breasts and is at the Amashayadwara (epigastric fossa). It's a position of properties of mind i.e. Trigunas (Sattwika, Rajasika, Tamasika Gunas). (*Sushruta Samhita Sharirasthanam : Ghanekar, Dr. Bhaskar Govind : Free Download, Borrow, and Streaming : Internet Archive*, n.d.)

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**Figure 1** Position of Hridaya Marma

### 2.1. Classification of *Hridaya Marma* –

- Dimension- 4 Angul
- Effect- *Sadhya Pranahar Marma*
- *Shadanganusar- Uro sthita Marma* ((26) (PDF) *Marma-1*, n.d.)
- Structural basis- *Sira Marma*
- Number- 1

### 2.2. Regional anatomy of *Hridaya Marma* (Dr D.Kundu, 2022)

- *Mamsa*- Cardiac muscles
- *Sira*- Coronary vessels, Arch of aorta & its branches
- *Snayu*- S.A. node, A.V. node, Purkinjii fibers, bundle of His, Vagus nerve, Cardiac plexus.
- *Asthi* – Tendinous Fibrous skeleton, Sternum, 2nd,3rd,4th ribs
- *Sandhi*- Posterior aspect of sterno-costal joint

#### 2.2.1. Cardiac muscles(Calvert & Lefer, 2012; Ripa et al., 2023)

Cardiac muscle comprises the thick middle layer of the heart and is surrounded by a thin outer layer called the epicardium or visceral pericardium and an inner endocardium.

#### 2.2.2. Nerve supply- Right and Left Vagas nerves (CN X).

#### Clinical Significance

Ischemic heart disease (IHD) includes angina pectoris, acute myocardial infarction, and sudden cardiac death.

#### Myocarditis

### 2.3. Coronary Vessel (Ogobuiro et al., 2023)

#### 2.3.1. Two primary coronary arteries-

- Right coronary artery (RCA)
- Left main coronary artery (LMCA)

#### Right Coronary Artery

- Supplies primarily to the right atrium, right ventricle.
- Sinoatrial nodal artery supplies to the SA node
- Septal perforating branch supplies to AV node

- Posterior descending artery (PDA) - posterior 1/3rd of the interventricular septum

#### Left main coronary artery (LMCA)

- Left anterior descending artery (LAD)- anterior 2/3rd of the septum & anterior portion of the left ventricle.
- Left circumflex (LCx)- left atrium & the postero-lateral aspect of the left ventricle & Small branches-obtuse marginal artery (OMA), diagonal.

### 2.4. Clinical Significance

- LAD stenosis affects the anterior septum, anterior free base, and mid-cavity level, apical segments of the septum, and anterior wall.
- LCx stenosis affects the anterolateral wall and the inferolateral wall.
- PDA stenosis affects the inferior septum and inferior free wall.
- Complete occlusion of the LAD results in an anterior wall MI, which appears as ST elevations in the precordial leads (V1-V4).
- Occlusion of the LCx results in a lateral wall MI, which appears as ST elevations in leads I, aVL, and V5-6.
- Occlusion of the PDA results in an inferior infarction, which would appear in leads II, III, and aVF.

### 2.5. Aorta & its branches(Mokhasi et al., 2011; Murray & Meguid, 2023)

- Ascending aorta: Left and right coronary artery
- Arch of the aorta: Brachiocephalic trunk, left common carotid artery, Left subclavian artery

#### 2.5.1. Clinical Significance

- Aortic dissection - severe, tearing chest pain that radiates to the back.
- Complications include aortic regurgitation may lead to decreased blood flow to the head and upper extremities.
- Aneurysms -localized dilation of an artery.
- Aortic coarctation -narrowing of the isthmus. Symptoms may include syncope, shortness of breath, epistaxis, headache, and chest pain.

### 2.6. S.A. node, A.V. node, Purkinje fibre, Bundle of His (Fogoros, 2012)

#### 2.6.1. Sinoatrial Node

The **sinoatrial (SA) node** is a collection of specialised cells (pacemaker cells), and is located in the upper wall of the right atrium, at the junction where the superior vena cava enters(Kashou et al., 2022).

#### 2.6.2. AV node

It is smaller than the SA node and is situated in the lower and dorsal part of the atrial septum just above the opening of the coronary sinus. It is capable of generating impulses at a rate of about 40 to 60 beats/min(Heaton & Goyal, 2023).

#### 2.6.3. Purkinje fibres

They are large pale fibres & generate impulses at the rate of 20-35 beats/minute.

#### 2.6.4. Bundle of His

An elongated segment connecting the AV Node and the left and right bundle branches of the septal crest.(Oosthoek et al., 1993; Patra et al., 2023)

#### Clinical Significance

- **Arrhythmia or irregular heartbeat**- problem with the rate or rhythm of heartbeat. Your heart may beat too quickly, too slowly, or with an irregular rhythm.

#### Types of arrhythmias

- Supraventricular arrhythmias-These begin in atria. "Supraventricular" means above ventricles or lower chambers of heart.
- Ventricular arrhythmias- These begin in heart's ventricles or lower chambers.

- Bradyarrhythmia's and junctional rhythms: These can happen because of issues in heart's conduction system, such as the sinoatrial (SA) node, atrioventricular (AV) node or His-Purkinje network

## 2.7. Vagus nerve & Cardiac plexus

(Capilupi et al., 2020; *Cardiac Plexus - e-Anatomy - IMAIOS*, n.d.; Maleszewski et al., 2016)

### 2.7.1. Vagus Nerve (Bazoukis et al., 2023)

Heart is innervated by the vagus at both cardiac muscle cells and at the conduction system atria, SA node, AV node, the ventricular myocardium, and the ventricular conduction system are all innervated by postganglionic efferent vagal fibers

The effects of vagus nerve is reduction in heart rate, reduction in atrioventricular conduction, changes in threshold for induction of atrial fibrillation (AF) reduction in ventricular contractility, reduction in threshold for induction of ventricular arrhythmias, etc.

अनाहत चक्र

**Location-** Hridaya

**Following body parts included under Anahata Chakra-** Heart, upper back including the thorax, the lower area of lungs, the blood and the blood circulation and the skin.

## 2.8. Anahata Chakra, Cardiac Plexus and Cardiac Activity (Deepa & Bhatnagar, 2016)

- Anahata means without any break; this indicates the relation of this chakra on heart.
- Anahata chakra modulates the heart rate and cardiac output.
- A malfunctioning of Anahata Chakra causes upper back and shoulder problems, asthma, heart conditions, shallow or rapid breathing and lung diseases.
- The cardiac autonomic nervous system consists of 2 branches sympathetic and parasympathetic.
- sympathetic branch -increasing the heart rate and myocardial contractility.
- parasympathetic branch- inhibitory effects that decrease heart rate and contractility.
- Alterations in autonomic function occur sudden cardiac death, congestive heart failure and myocardial infarction.
- The Anahata Chakra has 12 Dalas which can be compared to the 12 branches of the cardiac plexus on the basis of the numeration and structure of the Chakra.
- The 12 branches are Right deep cardiac, left deep cardiac, anterior pulmonary, posterior pulmonary, superficial cardiac, cardiac ganglion of wrisberg, Right coronary, Ventricular branch, Left coronary, Endo cardiac, Remak and Bibder's ganglia.

## 2.9. Cardiac Plexus-(Sharma et al., n.d.)

Divided into-

- Superficial part, which lies in the concavity of the aortic arch
- Deep part, between the aortic arch and the trachea.
- Sympathetic component of the cardiac plexus comes from cardiac nerves, which originate from the sympathetic trunk.
- Parasympathetic component of the cardiac plexus originates from the cardiac branches of the vagus nerve.

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## 3. Discussion & Conclusion

Hridaya Marma lies in thoracic cavity (Urobhag) in between two "Stana" (breast) above "Amashaya" (stomach), thereby the heart can be related to Hridaya Marma. Hridaya is the seat of Chetana; hence it maintains life process (Conscious). According to Rollin McCraty, Ph.D., Raymond Trevor Bradley, Ph.D. and Dana Tomasino, BA heart is seat of conscious along with brain. Experiments conducted at the Institute of Heart Math have found remarkable evidence that the heart's electromagnetic field can transmit information between people. According to Astanga Hridaya; Hridaya controls intellectual power and mental activities of human being by Manas and Sadakapitta (Muraleedhar & M., 2017).

The structures that are present in the region of Hridaya marma are-

- Mamsa– Hridayais a muscular bag or a structure made up of muscles. The myo cardium can be considered as the Mamsa Bhaga.
- Sira– means blood vessels. The single organ to which, the entire main blood vessels of the body are attached is to the Hridaya.
- Snayu– ligaments attached to the heart. There are multiple tendinous structure called Chordae Tendinae. They are present in the chambers. These can be compared to Snayus.
- Asthi– fibrous skeleton of the heart can be considered as the AsthiBhaga.
- Sandhi – it is explained in Samhita as that, Mandala Sandhi is present in the heart. They are ring like structures. The attachment of Valves to the heart can be compared to Mandala Sandhis
- Dasha Dhamanis – can be compared to the main vessels related to the heart
  - Aorta
  - Pulmonary trunk
  - FourPulmonary Veins
  - Superior Vena Cava
  - Inferior Vena Cava
  - Right Coronary Artery
  - Left Coronary Artery

Hridaya marma can be termed as Sadhyo pranahara marma as trauma results in death of the person immediately or within 7 days (fatal period) (A CRITICAL REVIEW OF HRIDAYA MARMA SIGNIFICANCE OF, n.d.-b)

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#### 4. Conclusion

Author should provide an appropriate conclusion to the article. Write conclusion as single para. Conclusion should be concise, informative and can be started with summarizing outcome of the study in 1-2 sentence and ended with one line stating: how this study will benefit to the society and way forward.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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