



# Study Of Anatomical Changes In Heart According To Doshanubandha In Amvata

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## Abstract

The symptoms of Doshanubandh of Amavat, it can be studied that whether Heart is structurally affected or not. And for this examination of body structure, Modern Technology can prove vital as Acharya Shushruta has said in Su.su.10/24.

Studies have been undertaken to see Hridvikruti in Amavat but according to Doshanubandh in Amavat what type of differentiation is seen in affected heart structures is not yet studied. This study focused on anatomical changes in Heart According to Doshanubandh in Amavat. In Chikitsa of Amavat it will be more helpful for Ayurvedic physician, if we know what structural deformity in Heart is present according to Doshanubandh in Amavat.

## Introduction

To make the diagnosis and treatment of various diseases, along with physiology, knowledge of Human Anatomy (Rachana Sharir) is important for Vaidya. Rachana Sharir is basic fundamental subject of ayurveda. Being fundamental, it is of utmost important in building of this ancient medical science.

Concept of Trimarma is very unique in Ayurveda and Hridaya is one of them. Hridaya is origin of Rasavaha and Pranavah srotas as well as site of Atma, Chetana, and Oja. Hridrog due to Amavat is very common root cause in India. It is crippling disease as it needs repeated hospitalization puts economic burden on family members leads to poor quality of life. In case of emergence of any disease, with the physiological aspect, the anatomical aspect is also mandatory to be taken care of.

Thus with the symptoms of Doshanubandh of Amavat, it can be studied that whether Heart is structurally affected or not. And for this examination of body structure, Modern Technology can prove vital as Acharya Shushruta has said in Su.su.10/24.

Studies have been undertaken to see Hridvikruti in Amavat but according to Doshanubandh in Amavat what type of differentiation is seen in affected heart structures is not yet studied. This study focused on anatomical changes in Heart According to Doshanubandh in Amavat. In Chikitsa of Amavat it will be more helpful for Ayurvedic physician, if we know what structural deformity in Heart is present according to Doshanubandh in Amavat.

**Key Word : Hriday,Heart, Doshanubandha, Amvata**

**Aim** - To find out structural involvement of heart according to doshanubandh in amavat.

### Objective

1. To study the structure of Heart According to Ayurved and Modern.
2. To the study of amvat According to Ayurved and Modern.
3. To study the structural involvement of heart according to doshanubandh in amavat.

### Material and Method

#### MATERIALS:

1. Compilation of all references of the term 'Hridaya' from Brihatrayi, Laghutrayi & classical Ayurvedic text & other literature were done.
2. Compilation of anatomical Structure of Heart from modern text was done.
3. For present study 60 patients of Amavat were taken.
4. Case report form & Consent paper were prepared.
5. 2D Echocardiography was done to find out structural involvement in Heart.

#### INCLUSION CRITERIA:

1. Patient Suffering from Amavat at least 5 years and having clinical manifestation.
2. Irrespective of Gender, Age, Occupation.
3. Irrespective of socioeconomic status.

#### EXCLUSION CRITERIA:

1. Congenital Heart Diseases.
2. Patient with k/c/o Carcinoma.
3. Severe Systemic Diseases.
4. Patients with Acute Myocardial infarction, unstable Angina.

#### METHODS:

1. In present study pre diagnosed 60 cases of Amavat were taken, this patient then categorized according to Doshanubandh.
2. After appropriate counseling, written consents were taken from the patients.
3. All the details of patients & disease were noted on specially prepared case report form.
4. Assessment of sign and symptoms were done as mentioned in Madhav Nidanam.
5. 2D Echocardiography was done. Structural involvement and affected structures were noted.

#### ASSESSMENT CRITERIA:

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1. If lakshana Present in patient, it was assessed as '1' and if lakshana absent in patient, it was assessed as '0'.
2. If any patient showing lakshana of one or more doshanubandh than the maximum number of lakshana were taken as doshanubandhatav.
3. Patient thus categorised as per Doshanubandh undergone 2- D Echocardiography Study and structural changes and Structural Involvement were assessed.

**Table-1: - Vatanubandh Amavat**

In Vatanubandh Amavat Sandhi Shool is Pradhan Lakshana of Patient due to Vitiated Vyau. Shoola is the pradhan lakshna which bring patient to the Vaidya.

Symptoms	Present	Absent
Shoola	1	0

**Table-2 :- Pittanubandh Amavat**

In Piitanubandh Amavat Daha and Raga are main lakshana present in sandhi. Daha and Raga are due to Prakupit pitta.



Symptoms	Present	Absent
Daha	1	0
Raag	1	0

**Raga lakshana in right knee joint.****Table-3: - Kaphanubandh Amavat**

Symptoms	Present	Absent
Stimitata	1	0
Guruta	1	0
Kandu	1	0

**Guruta lakshan in leg.**

In Kaphanubandh Amavat Stimitata, Guruta and Kandu are main lakshana present in sandhi. This lakshana are due to Prakupit Kapha.

**Observation & Result****Observation No. 1. Lakshana distribution**

1. **Vaatanubandh** - Out Of 60 patient Vatanubandh Amavat is Present in 35 patients (58.33%) and absent in 25 patients. (41.66%)
2. **Pittanubandh** -Out of 60 patient Piitanubandh Amavat is Present in 15 patients (25%) and absent in 45 (75%) patients.
3. **Kaphanubandh** -Out of 60 patients Kapahnuandh Amavat is Present in 10 patients (16.66%) and absent in 50 patients (83.33%)

**Observation No. 2- Distribution of Structural Involvement in Heart**

From the study, the findings in 2-D Echocardiography as a structural involvement in descending order are Mitral Regurgitation (20 patients), Mitral Stenosis (14 patients), Aortic regurgitation (12 patients), Tricuspid regurgitation (10 patients), and Aortic Stenosis (04 patients). none of the patient found with Tricuspid Stenosis. Mitral valve is most common involved structure of heart.

**Observation No. 3. Distribution of Structural Changes**

In 60 studied patients Changes of dilated Left ventricle is found in 39 patients. Left Atrium dilatation is found in 19 patients, Right atrium dilatation found in 08 patients, and 08 patients showing Right Ventricular Dilatation.

Dilatation of Chambers is common Structural Change in Heart due to Amavata and Left ventricle is most common in it.

#### **Observation No. 4. Altered functions due to Structural changes in**

**Heart - LV Ejection Fraction %** On the basis of study, out of 60 patients, 29 patients (48.33%) having LV Ejection fraction in the range of 56-65%. 18 patients (30%) having Ejection Fraction between 46-55%, 07 patients (11.66%) having ejection fraction between 25-35%. 05 patients (8.33%) having LV Ejection Fraction in the range of 36-45% and only 1 patient (1.66%) is above 65%.

#### **Observation No. 5. Altered functions due to Structural changes in Heart - Pulmonary Hypertensions**

In 60 studied patients 49 patients (81.66%) having normal Pulmonary Hypertension, 08 patients (13.33%) has Moderate Pulmonary Hypertension, and 03 patients (05%) has mild pulmonary Hypertension.

#### **Observation No. 6. Altered functions due to Structural changes in Heart - Diastolic Dysfunction (Grade)**

In the study it has been noted that 32 patients (53.33%) having grade I diastolic dysfunction, 13 patients (21.66%) having grade II diastolic dysfunction, 02 patients (03.33%) having grade III diastolic dysfunction and 13 patients (21.66%) nil from diastolic dysfunction.

#### **Observation No. 7. Structural Involvement in Heart according to Vaatanubandh**

In Vatanubandh patients 20 patients showing mitral Regurgitation, 14 patients showing mitral stenosis. And 1 patient does not show any valve involvement so not included in above chart.

#### **Observation No. 8. Structural Involvement in Heart according to Pittanubandh**

In Pittanubandh patients 12 patients showing Aortic Regurgitation, 04 patients showing Aortic stenosis. And none of them shows other valve involvement.

#### **Observation No. 9. Structural Involvement in Heart according to Kaphanubandh**

In Kaphanubandh Amavat all ten patients showing Tricuspid Valve Regurgitation. And none of them shows other valve involvement.

#### **Observation No. 10. Structural Changes in Heart according to Vaatanubandh**

Out of 39 Patients of Dilated Left Ventricle, 27 Patients showed Vatanubandh Amavata Lakshna and 19 of 19 Patients of Dilated Left Atrium Size Showed Vatanubandh Amavata Lakshana.

#### **Observation No. 11. Structural Changes in Heart according to Pittanubandh**

Out of 39 Patients of Dilated Left Ventricle 12 Patients showed Pittanubandh Amavata Lakshna

#### **Observation No. 12. Structural Changes in Heart according to Kaphanubandh**

All Patient Having Kaphanubandh Amavat showed Dilated Right Ventricle And Dilated Right Atrium.

#### **Observation No. 13. Altered functions due to Structural changes in Heart - LV Ejection Fraction % in comparison to Doshanubandh**

In comparison to doshanubandh 29 patients (22-vatanubandh, 07-pittanubandh) having LV Ejection Fraction between 56-65%. 18 patients (05-vatanubandh, 05-pittanubandh, 08-kaphanubandh) having LV Ejection Fraction In between 46-65%. 07 patients (05-vatanubandh, 02-kaphanubandh) having LV Ejection Fraction In between 25-35%. 05 patients (03-vatanubandh, 02-pittanubandh) having in between 36-45% and 1 patient (pittanubandh) is above 65% LV Ejection Fraction.

Thus from the table variation in LV Ejection Fraction is present in all types of Doshanubandh and it not found Specific for any doshanubandh in Amavat.

**Observation No. 14.**

Altered functions due to Structural changes in Heart - pulmonary Hypertention in comparison to **Doshanubandh**

On the basis of study out of 60 patients, 49 patients (34 vatanubandh, 15 piitanuabndh) having normal pulmonary hypertension, 8 patients having modrate pulmonary hypertension (8-kapahnuandh) and 3 patients (1 vatanubandh, 2 kapahnuandh) having mild pulmonary hypertension. Thus from the above table it can be seen that pulmonary hypertension is present in all kapahnuandh patients.

**Observation No. 15.**

Altered functions due to Structural changes in Heart - Diastolic Dysfunction (Grade) in comparison to **Doshanubandh**

Out of 60 patients 32 patients (17-vatanubandh,9-pittanubandh, 6-kapahnuandh) having Grade I diastolic dysfunction.13 patients (6-vatanubandh, 4-pittanubandh, 3 kaphanubandh) having Grade II diastolic Dysfunction. 2 patients (1- vatanubandh, 1-kapahnuandh) having grade III diastolic Dysfunction. and 13 patients (11-vatnubandh, 2-pittanubandh) having nil diastolic dysfunction.

Thus from the study Diastolic dysfunction can be present in either Doshnuandh of Amavat, but it is always Present in kahanubandh Amavat.

**Observation No. 16. Showing structural involvement and structural changes as per Doshanubandh in Amavaat**

Doshanubandh	Structures Involved	Structures Changes
Vaatanubandh	Mitral Regurgitation	Left Ventricle
	Mitral Stenosis	Left Atrium
Pittanubandh	Aortic Regurgitation	Left Ventricle
	Aortic Stenosis	
Kaphanubandh	Tricuspid Regurgitation	Right Atrium
		Right ventricle

**Discussion**

- **Structural Aspect**

Heart is described as regards its size, shape, location, relations with surrounding structures and development embryo logically in ancient literature.

**Following are salient points:**

1. Heart is a single organ not double like lungs or kidneys. It is pradhan marma foremost amongst the vital organs of the body; **sadyah pranharā marma** causing instantaneous death when injured.
2. It is located inside the trunk within the chest, (kosthanga urasi). It is situated between two nipples; stomach, liver and spleen support it from below; lungs, trachea and great vessels surround it on sides and from above. It is not exactly in the centre but projects slightly on the left side.
3. It is made up on flesh but has common origin with blood vessels. (Amarkosh)
4. This muscle is endowed with extraordinary stability fire and digestive juices do not consume it easily and rapidly.
5. It is hollow organ. It is of the size of one's closed fist. It's interior resembles a meshwork and is full of blood.



6. In shape and size and also in colour and appearance, it resembles a lotus bud, hanging from a bent stem with its tip hridayagra pointing downwards (Adhomukham). This simile of lotus is universally adopted in sanskrit literature.
7. Embryologically-Heart is derived from the **purest essence of blood and kapha**, thus being fleshy at the same time having greater stability and strength than other of flesh in the body. (Shonit kapha prasadjam Hridayam).It is the first organ to start its function in utero and last to stop only after death.
8. It is connected with the respiratory and digestive systems from which it gets supplies of prana and rasa respectively and transports the same to the rest of body through blood vessels. The whole body and its organ are dependent on the heart.
9. Hridaya and Panchmahabhootas: Hridaya is derived from purest essence of blood and kapha. So teja,jala, prithvi has greater dominance in it's constitution . Hridaya is aashaya and hence derived from mansa.
10. Mind affects the activity of the heart. Heart is affected in intellectual pursuits and in emotional upheavals like rage, sorrow, pleasure, pain fear,anxiety, depression or excitement. Hence heart is considered to be seat of mind and intellect. (Mano buddhi Nivasa)
11. Proper function of the heart depends upon quality and quantity of rasa dhatu, the fluid which it pumps. Circulation of blood depends on the activeness of the heart while hearts activity depends on the optimum quality and quantity of blood.
12. It is Ojas which endows the heart with its characteristic tonicity and power of incessant work. Ojas is a substance which pervades all the cells, tissues and organ of body but heart is considered as the abode of ojas which prevents it from destruction. The concept of Ojas is peculiar to Ayurvea. It is a material believed to be intimately mixed with rasa yet derived from essence of finest end products of all dhatus.
13. Heart is nothing but mass of flesh; but it being the seat of three doshas and three gunas ascribed to mind and soul derives its driving force from these basic organizations of life. Vata in the form of prana imparts moving force, Pitta in form of sadhaka pitta protects it from inertia and fatigue and gives power to match with situations, alertness and consciousness, Kapha in the form of Avalambaka kapha and ojas repairs it and prevents wear and tear, conserves its tone and force. Tamas and kapha slow down the heart and produce sleep. Satwa and pitta refreshes it, makes it responsive, alert and conscious. Rajas and vata activates it, keep it moving i.e. excitability and tonicity. They all work in coordination for maintaining life.

#### ▪ **Involment as Per Doshanubandh:**

##### 1. **Vatnubandh:**

There was significant mitral leaflet prolapsed causing mitral regurgitation, between Vatanubandh Amavat patients. And Reduce mitral orifice area causing mitral stenosis,this is due to prakupit vyau causing extra force against stenosed valve. This force causes increased in pressure of the heart chamber's, visharoppi ama with prakupit vyau causes prolapsed of leaflet. This extra force of vyau causes dilatation of the heart chambers, hence there is significant dilated left atrium and left ventricular size in Vatanubandh Pateints.

Shoola: Hridaya is origin of both Rasavaha and Pranavaha srotasa.When moolsthana is affected the whole srotasa is affected . this prakupit vyau produces tivra shoola in Vtanubandh Amavat. Due to affected Pranavaha srotas shwas lakshana is seen in this patients,due to dushti of pranvaha srotas cells cannot get prakrut pran vyau producing shwas lakshana,this lakshan not mentioned in Amavat vyadhi but mentioned in Samanya lakshana of Hridroga. (cha.chi. 26/75-78)

##### 2. **Pittanubandh:**

There was involvement of Aortic valve in the form of thickend leaflet,reduce annulus and sclerocalcific changes producing significant Aortic Regurgitaion and Aortic stenosis.

Daha and Raga: Hridya is the sthan of sadhak pitta ,as aorta supplies rasa rakta to whole body vikshepan of rakta get affected and pitta due to its ushana and tikshna guna causes Daha and Raaga lakshna.visharoppi ama with prakupit pitta affectes the aortic valve producing above changes. Due to reduce in aortic valve area pressure increases in back word direction causing left ventricular enlargement.

### 3. Kaphanubandh:

There was involvement of Tricuspid valve in the form of tricuspid regurgitation in Kaphanubandh Amavat. As seen from review of Literature tricuspid valve is in between right atrium and right ventricle. Due to regurgitation rasa rakta produces backward transmission of pressure in pulmonary venous system. This in turn affects right ventricle causing dilatation and hypertrophy of right ventricle. Subsequently right atrium is enlarged when right heart failure supervenes producing cardiomegaly. Kapha, rakta, rasa, Mansa all these contribute for enlargement of heart. Increase in size of heart i.e hrid—vyas is karma of prakupit vayu.

- Stimitata: visharoppi ama along with dushit kapha produces stimitata that is wearing like wet cloth in sandhi sthani.
- Guruta: mainly seen on dependant part. Vikshepan of Rasa—Rakta is affected producing Guruta. It is pradhan lakshan of increase in right size of the heart
- Kandu: Vikshepan of rasa rakta provides poshak ahar-ras and prana to all cells. As vyan karma is affected due to its prakop, and ahar rasa get affected by dushit kapha cells become deprived of its nourishment producing kandu.

#### ▪ Altered functions due to Structural changes in Heart –

##### A) LV Ejection Fraction %:

As heart is dilated in Amavat, this increase in hrid vya produces increase in the size of mansa, this increase mansa needed poshak rasa rakta to fulfill the requirement. But due to prakupit vyau and ama the increased size of mansa does not get proper poshan, it decreases its functional capacity to pump the rasa rakta to other part of body causing decrease in LV Ejection Fraction. Variation in LV Ejection Fraction is present in all types of Doshnubandh and it not found Specific for any doshanubandh in Amavat.

##### A) Pulmonary Hypertention:

Tricuspid regurgitation produces backward transmission of pressure in pulmonary venous system. This in turn affects right ventricle causing dilatation and hypertrophy of right ventricle. Subsequently right atrium is enlarged. This enlarged in right side of the heart increases pressure in pulmonary system causing pulmonary hypertension. Tricuspid regurgitation is seen in kaphanubandh amavat, hridya is sthan of Avalambak kapha, it gets dushit by ama. From the study pulmonary hypertension is present in all kaphanubandh patients.

##### B) Diastolic Dysfunction:

Dilatation of heart increase its work to fulfill needs, To make up for this shortage, Hridaya increases its gati of sankochan and vikasan producing extra effort to fulfill body needs. This sankoch and vikas due to extra gati of heart produces less time to fill poshak rasa rakta in heart chambers, causing decrease in vikasan of chambers producing Diastolic Dysfunction. As in all doshanubandh of amavat sankochan and vikasan affected due to structural changes. Diastolic Dysfunction found in all either types, but always present in kaphanubandh Amavata.

These manifestations are due to involvement of heart. And doshanubandh lakshana shows significant finding in heart. Hence we can say Amavat is associated with Doshanubandh and there is difference in structural involvement in heart in different doshanubandh of amavat.

Amavat is a pradhan disease while involvement of Heart occurs as updrava. Above mentioned clinical manifestations are updrava Lakshanas of Amavat.

Thus it is evident that amavat causes structural changes in Heart. Change in size of left ventricle, left atrium, Right ventricle and right atrium.

- In **vatanubandh** - thickened leaflets, reduced mitral orifice area, mitral leaflet prolapsed,
- In **Pittanubandh** - sclerocalcific changes in aortic valve causing aortic regurgitation, aortic stenosis.
- In **Kaphanubandh** - tricuspid reurgitaion causing significant right side dilatation and pulmonary hypertension.

The point which needs special mention is that “AMA” which is produced in this disease is different from ama which is produced in other diseases like jwara because this ama has the potential to cause structural involvement and structural changes in Heart.

This ama is VISRROOPI AMA i.e amavisha having properties similar to visha. Sookshma, ashu, tikshna, vikasi etc all the gunas of visha destroys dhatu sanghatan producing anatomical changes. Also the prakop of vayu causes both anatomical and physiological changes in Heart. Thus from above findings there is difference in structural involvement in heart in different doshanubandh in Amavat.

### Clinical Utility:

If Ayurvedic Physician diagnosed Amavat on the basis Doshanubandh then we can judge what type of structure in heart is involved in that patient.

This can be helpful in remote area where 2 D Echocardiography is not available.

On the basis of this Doshanubandh, Doshashamak and Cardio-protective chikitsa should start from the primitive stage of Amavat.

### Conclusion

1. In Vatanubandh Amavat.
  - A) Structures involved in descending order are:  
Mitral regurgitation & Mitral stenosis
  - B) Structural change as dilatation in size of:  
Left ventricle and Left Atrium.
2. In Pittanubandh Amavat.
  - A) Structures involved in descending order are:  
Aortic regurgitation & Aortic stenosis
  - B) Structural change as dilatation in size of:  
Left ventricle.
3. In Kaphanubandh Amavat-
  - A) Structure involved is: Tricuspid regurgitation
  - B) Structural change as dilatation in size of:  
Right Ventricle and Right Atrium.
4. Variation in LV Ejection Fraction is present in all types of Doshnubandh and it is not found Specific for any doshanubandh in Amavat.
5. Pulmonary Hypertension is always present in all Kaphanubandh Amavat.
6. Diastolic dysfunction is found in all three doshanubandh, but always present in kaphanubandh Amavat.

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