



PHYSIOLOGICAL UNDERSTANDING OF *MAMSA DHATU* AND *MOOLA* OF *MAMSAVAHA SROTAS*

Iranna Doddaveerappanavar¹, Rajashekhar K N², Arjun N³

PG Scholar¹, Professor and HOD², Assistant Professor³

Department of PG studies in Kriya Shareera, Alva's Ayurveda Medical College, Moodbidri, Karnataka, India.

ABSTRACT

Introduction: *Dosha, Dhatu* and *Mala* are considered as the *Moolas* of *Shareera*¹. *Dhatu*s are the entities which supports our body and helps in performing proper physiological functions. There are Seven *Dhatu*s explained in ayurvedic classics. Among the *Sapta Dhatu*s, *Mamsa Dhatu* is the third *Dhatu* which mainly involves in *Shareera Lepana* function that is covering of the body². *Mamsa Dhatu* is located in its *Srotas* as well as in the whole body. *Moolasthanas* of *Mamsavaha Srotas* is *Snayu, Tvak* and *Raktavaha Dhamani*³.

Aims and Objectives: To understand the *Mamsa Dhatu* and *Mamsavaha Srotas* and its possible physiological interpretations.

Materials and Method: Literature searches were conducted using classical text in *Ayurveda*, contemporary books, articles and many others.

Discussion and conclusion: *Mamsa Dhatu* plays a vital role in maintaining the physical integrity of the body. The possible interpretation of the *Moolasthanas* of *Mamsavaha Srotas* can be understood as tendons, ligaments and blood vessels.

Key words: *Mamsa, Mamsa Dhatu, Mamsavaha Srotas, Muscle*

INTRODUCTION:

Ayurveda explained about *Saptha Dhatu*s they are *Rasa, Rakta, Mamsa, Meda, Asthi, Majja* and *Shukra*⁴. These *Dhatu*s acts as the building blocks of the body. Among them *Mamsa* is the third *Dhatu* which cover the body and gives support to the body. It is the most abundant tissue of the body and 40 % of the body weight is constructed by it. It contains about 75% of the body water and 21% of the body protein⁵. Nourishment of the *Mamsa Dhatu* is the ultimate nourishment of the whole body⁶. All the activities of the body are controlled by the functions of *Mamsa Dhatu*⁵.

ETYMOLOGY OF MAMSA WORD:

The word *Mamsa* has originated from " *Man* " *Dhatu*⁷. It is the *Dhatu* that which produced from *Rakta Dhatu*.

DEFINITION OF *MAMSA DHATU*:

Body constituent which gives *Pushti* (strong and bulk) to the body and which covers the bones, joints in the form of tendons, ligaments, etc. which is responsible for *Akunchana* (Contraction) and *Prasarana* (Relaxation) is called as *Mamsa Dhatu*⁷.

SYNONYMS OF *MAMSA* ⁸:

- 1) *Pishita* - Embryologically, *Mamsa Peshi* developed from *Mamsa Dhatu*.
- 2) *Palala* - *Mamsa Dhatu* covers all the parts of the body
- 3) *Kravya* and *Amisha* - Humans eats animal flesh hence the name *Kravya* and *Amisha*
- 4) *Raktodbhava* - As it is developed from *Rakta Dhatu*
- 5) *Medaskrit* - As it is involved in the origin and development of *Medo Dhatu*

PANCHAMAHA BHUTA PREDOMINANCE:

Mamsa Dhatu is made up of *Parthiva Mahabhuta* predominantly along with other *Mahabhutas*⁹.

LOCATION OF *MAMSA DHATU*:

As *Mamsa Dhatu* one among the *Saptha Dhatus*, it is present in entire body. Location of *Mamsa Dhatu* is in its *Srotas* as well as in all body organs directed in *Mamsadhara Kala*¹⁰. It may be present in large quantity in some organs and may be functioning specifically in context to some organs. Such places are the location of *Mamsa Dhatu*.

FORMATION OF *MAMSA DHATU*¹¹:

Mamsa Dhatu is the third *Dhatu* among *Saptha Dhatus*. When *Rakta Dhatu* takes its origin in *Raktavaha Srotas*, *Rakta Dhatwagni* acts on its nutrients coming from *Ahara Rasa* and from *Rasavaha Srotas*. *Rakta Dhatu* is produced in *Raktavaha Srotas*. Part of *Rakta Dhatu* reaches to next *Srotas* that is *Mamsavaha Srotas*, it takes part in formation of *Mamsa Dhatu*. Nutrients coming from *Ahara Rasa* and *Raktavaha Srotas* are acted upon, by *Mamsa Dhatwagni* and gives rise to *Mamsa Dhatu* proper.

PROPERTIES OF *MAMSA DHATU*:

Direct reference of properties of *Mamsa Dhatu* is not found but in *Charaka Samhita*, qualities of *Mamsa Dhatu* is compared with *Mamsa Dhatu* of goat¹². Human *Mamsa Dhatu* is not too cold, it is neither heavier nor it is too unctuous¹².

UPADHATU OF *MAMSA DHATU*:

According to *Charaka*¹³ - *Vasa* and *Tvacha*

According to *Sharangadhara*¹⁴ - *Vasa*

MALA OF *MAMSA DHATU*¹⁵:

They are - *Kha Mala* (*Mala from Nasa, Mukha, Yoni, Netra*)

TIME TAKEN FOR FORMATION OF *MAMSA DHATU*:

According to *Sushruta Samhita*,

Mamsa Dhatu is formed from *Ahara Rasa* on 10th day

According *Charaka Samhita*,

Time taken for *Dhatu* formation is depends on the strength of *Agni*.

According to Parashara -Third day

MAMSADHARA KALA:

Kala means the connective tissue sheath. *Mamsadhara Kala* is the first *Kala* which is developed during embryological development which holds the *Sira*, *Snayu*, *Dhamani* and *Pratana*¹⁶. Just like how lotus flower and its parts like stem etc grow in the mud similarly *Sira, Dhamani etc* grow in *Mamsa Dhara Kala*¹⁷.

MAMSA PESHI:

Organelles of *Mamsa Dhatu* are separated by *Peshi*¹⁸. *Mamsa Peshi* covers body constituents like *Sandhi*, *Sira*, *Snayu*, etc. and It provides Strength and maintains body posture¹⁹.

Numbers:

A/C Charaka- 400.

A/C Sushruta- 500 (400 in *Shakha*, 66 in *Kosta* and 34 in *Urdva Bhaga Greeva*.)

In females 20 Extra = 520

MAMSA DHATU KARMA:

- 1) *Lepana Karma*²⁰ – Covering the skeletal body is the specific function.
- 2) *Shareera Dharana*²¹ - To support the body is the general function of *Dhatu*.
- 3) *Mamsa Dhatu* gives strength to the body and nourishes *Medo Dhatu*²².
- 4) *Mamsa Peshi* formed from *Mamsa Dhatu* which covers the *Sira*, *Snayu*, *Asthi*, *Sandhi* etc and gives strength to them. Here strength means capacity to do the physical activities like running, walking etc body movements.

MAMSA DHATU SARA LAKSHANA²³:

Individual having *Mamsa Sarata* possesses the following manifestations -temporal part of face, forehead, occipital joint, eye, cheeks, chin, neck, shoulders, abdomen, axilla, chest, foot and joints are well covered with *Shthira*, *Guru* and *Shubha Mamsa*. Because of *Mamsa Sarata*, people acquire quality to excuse others, retain power, they feel no lust they have strength to earn, they are educated, they are soft spoken healthy and achieve strength and long life. *Acharya Sushruta* states that *Mamsa Sarata individual* means a person who does not show cavities or depression in the body.

MAMSA VRUDDI LAKSHANA²⁴:

- 1) Enlargement of cheeks, thigh and abdomen due to hypertrophy of the muscles of these organs.
- 2) Excess nodular growth.
- 3) Excess fleshy growth in the throat.
- 4) Tumours (benign or malignant).

MAMSA KSHAYA LAKSHANA²⁵:

- 1) Fatigue of sensory organs due to general debility.
- 2) Atrophy (decreased size) of cheeks and buttocks.
- 3) Patient looks thin and emaciated due to malnourishment of *Mamsa Dhatu*
- 4) Arthralgia (joint pain)

MAMSAVAHA SROTAS:

Srotas are the Channels meant to carry *Dhatu* during the process of transformation from one *Dhatu* to another *Dhatu*. *Mamsavaha Srotas* helps to transport the materials needed to make the muscle tissue in the body.

MAMSAVAHA SROTO MOOLA:

- ❑ A/C *Charaka*²⁶- *Snayu* and *Tvak*
- ❑ A/C *Sushruta*²⁷- *Snayu, Tvak* and *Raktavaha Dhamani*.

DISCUSSION:**A] Sequence of *Mamsa Dhatu* and *Mamsa Dhara Kala*²⁸:**

Mamsa Dhatu is the first immobile *Dhatu*. Support can be given with *Sthira* or firm subjects. Hence *Mamsadhara Kala* is supposed to be the first one to support developing fetus. This may be the reason why *Mamsadhara Kala* is explained first. As described in *Sushruta Samhita* by *Dalhana*, *Rasa-Rakta- Mamsa* etc. is the sequence of nourishment, whereas *Kala* is meant for *Dharana Karma* that is for support and therefore the sequence is different.

B] Understanding of *Mamsadhara Kala*

Mamsadhara Kala is connected to connective tissue that surrounds and shields muscle tissue. A fascia is a large band of fibrous connective tissue. Skin and muscle are separated by the superficial fascia. It is made up of adipose tissue and areolar connective tissue, which allows lymphatic, vascular, and nerve vessels to enter and exit muscles. Muscles are held together by dense, asymmetrical connective tissue called deep fascia, which lines the body's walls and limbs. Deep fascia fills the gaps between muscles, carries lymphatic, blood, and nerve vessels, and permits unrestricted muscular movement²⁹. From the deep fascia, three layers of connective tissue expand to further protect and reinforce the skeleton muscle. The epimysium is the outermost layer that envelops the entire muscle. When skeletal muscle is attached to other structures, such bone or another muscle, the connective tissue runs continuously through the epimysium, perimysium, and endomysium. So, we can correlate this *Mamsadhara kala* with the superficial fascia, deep fascia and intermuscular septa that separate the muscle from underlying structures.

C] Discussion on *Mala* of *Mamsa Dhatu*

Mamsa Dhatu Mala is *Khamala*³⁰. The word meaning of *Kha* is *Akasha* which means space or cavities of the body. So, *Mala* produced in the cavities of the body or *Mala* which is produced in the open spaces especially in *Bahirmukha Srotas* like *Nasa, Karna, Netra, Yoni* etc. is called as *Khamala*. This *Khamala* can be correlated to various secretions like ear wax, nasal discharges or mucus, oral debris like dental plaque, sebum etc in the body which contains glycerol, cholesterol, fatty acids etc in their composition which are oily in nature-like muscle tissue and helps to maintain the equilibrium of the body by expelling the tissue wastes from the body.

D] Discussion on *Upadhatu* of *Mamsa Dhatu***❖ *Vasa***

Vasa is derived from the *Mamsa Dhatu*. It is nothing but the extract of *Mamsa Dhatu* that is *Mamsa Niryas*³¹. *Vasa* is the one which is located in the *Mamsa* which is oily in nature and appears like *Meda*³². It can be correlated to fat that fills up the muscle spaces and supports the structures like blood vessels nerves etc.

❖ *Tvacha*

Tvacha or *Twak* is the structure that which protect and covers the entire body. It is the *Moolasthan* of *Mamsavaha Srotas*²⁶ and it is also a site of *Bhrajaka Pitta*³³. *Twak* is mentioned as the *Adhishthana* of *Sparshanedriya* which is one among the *Gyanendriya* and its function is to perceive *Sparsha Gyana* that is

sense of touch. It is nothing but skin which spreads all over the body and protect the body from external environment. It is one among the sense organs which helps to perceive sense of touch.

E] *Mamsa Dhatu* as Muscle tissue

- Muscle is a tissue which is responsible for our movements both visible and invisible like walking, talking, bowel movements, heart beats etc. Humans has more than 600 muscles³⁴. Muscles tissue is made up of large number of individual muscle cells or myocytes³⁵.
- Composition muscle- Water - 75%, Solids - 25% among solids, Organic - *Proteins* like actin, myosin, troponin, nebulin etc. Other like carbohydrates, lipids and nitrogenous substance, Inorganic - like potassium, sodium, calcium magnesium etc.

□ Reasons for correlating *Mamsa Dhatu* with muscle tissue

- *Mamsam Mamsen Vardhate*. As we know that when a person eats *Mamsa*(meat) it will increase the bulk of the muscle in the body based on the *Dhatu Samanya* concept that is *Samanya Vruddi Karanam*³⁶ (similar things will increase). So, meat is an important source of proteins and all essential amino acids, iron, zinc, potassium etc which will help to increase the bulk of the *Mamsa Dhatu* in the body.

- Muscle tissue does the covering of skeletal body just like how *Mamsa Dhatu* does the covering of whole *Shareera* as one of main *Karma* of *Mamsa Dhatu*.

- As muscle tissue helps in the movements of bones and joints and maintains the stability like *Mamsa Dhatu* which helps in the movements of *Sandhi, Asthi* and *Snayu* etc. by considering these above points we can conclude that muscle tissue as the *Mamsa Dhatu* in the body.

F] *Moola* of *Mamsa Dhatu*

❖ *Snayu* as Tendons and Ligaments

Tendon is the structure that connects muscle to bone and helps in movements of bones and joints by transmitting the force resulted from muscle to the bone. Ligament is the Structure that connects bone to bone and helps in holding and movements of bones and joints along with muscle and tendons. Disorders of tendons and ligaments leads to stiffness in muscle, restricted movements that shows if anything happened tendons and ligaments that causes disturbance in the functions of muscle tissue by considering this point, we can correlate *Snayu* as tendons and ligaments.

❖ *Tvak* as Skin

Skin is the largest organ of the body. It is not uniformly thick. At some places it is thick and at some places it is thin. The average thickness of the skin is about 1 to 2mm. Skin is the outer covering of the body that which covers the body structures. It has seven layers of ectodermal tissue and guards the underlying muscles, bones, ligaments and internal organs. Muscle which is present just below the skin is protected by skin and gets strength from it. Muscle is the continuation of the skin and fat tissue. Skin also helps in the regulation of temperature and nourishment of the *Mamsa Dhatu* thereby it helps for the sustenance of *Mamsa Dhatu*. So, by considering the skin functions like protection, regulation and nourishment etc which are helpful for the origin and sustenance of *Mamsa Dhatu* i.e. the function of *Moola Sthana*, *Tvak* can be considered as the skin as one of the *Moola* of *Mamsa Dhatu*.

❖ *Raktavaha Dhamani* as Blood Vessels

Blood vessels are the structures that carry the blood from the heart to the tissue and Vice verse. Helps in actions of muscles like flexion, extension etc. through the exchange of ions like sodium, calcium and potassium etc. and also these blood vessels carry the nutrition from stomach to the muscle tissue thereby helps for the nourishment of the muscle tissue. Hence blood vessels play a role of *Moola Sthana* of *Mamsa Dhatu* by helping in exchange of ions, ATPs etc. as well as muscle tissue nourishment.

CONCLUSION:

Dhatus are the structures which provides the *Dharana* (support) and *Poshana* (nutrition) to the *Shareera*. Among *Saptha Dhatus*, *Mamsa Dhatu* which carries the main *Karma* as *Lepana* (covering) is nothing but muscle tissue which covers the skeletal body. *Mamsadhara Kala* is the first *Kala* in which *Mamsa*, *Sira*, *Snayu* are produced and spreaded. *Mamsadhara Kala* can be corelated to the superficial fascia, deep fascia and intermuscular septa that separate the muscle from underlying structures. Skin can be considered as *Moola* of *Mamsa Dhatu* based on the functions like protection, regulation and nourishment etc which are helpful for the origin and sustenance of *Mamsa Dhatu*. By considering the other functions like maintaining the body posture, movements of bones and joints, exchange of ions, supplying of nutrients etc. *Snayu* and *Dhamani* (blood vessels) can be considered as *Moola* of *Mamsa Dhatu*. To conclude *Mamsa Dhatu* is the structure which is interlinked with skin, blood vessels, bones, ligaments, tendons, joints etc.

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