

A Comprehensive Review on the Role of *Mamsa Dhatu* in Muscle Regeneration and Tissue Repair

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Abstract—*Mamsa Dhatu* is one of the seven fundamental *Dhatus* described in Ayurveda and plays a pivotal role in providing structural integrity, strength, and stability to the body. It is primarily responsible for covering vital organs, facilitating movement, and maintaining physical endurance. Proper nourishment and equilibrium of *Mamsa Dhatu* are essential for effective muscle regeneration and tissue repair. Classical Ayurvedic texts describe that the formation of healthy *Mamsa Dhatu* depends on the quality of *Rasa* and *Rakta Dhatu* as well as the optimal functioning of *Agni*. Vitiation of *Mamsa Dhatu* leads to delayed wound healing, muscle wasting, reduced strength, and susceptibility to tissue injury. From a modern perspective, muscle regeneration involves activation of satellite cells, protein synthesis, angiogenesis, and modulation of inflammatory responses—processes that closely parallel Ayurvedic concepts of *Dhatu Poshana*, *Vrana Ropana*, and *Balya* actions. This study explores the role of *Mamsa Dhatu* in muscle regeneration and tissue repair by correlating Ayurvedic principles with contemporary biological mechanisms. Understanding this integrative approach provides a scientific basis for Ayurvedic therapeutic strategies aimed at enhancing muscle healing, improving tissue integrity, and restoring functional capacity.

Keywords—*Mamsa Dhatu*; Muscle regeneration; Tissue repair; *Dhatu Poshana*; *Vrana Ropana*; Ayurveda

I. INTRODUCTION

Ayurveda describes the human body as being sustained by seven fundamental structural components known as *Sapta Dhatu*, among which *Mamsa Dhatu* occupies a vital position due to its role in providing form, strength, and functional stability to the body¹. *Mamsa Dhatu* is responsible for covering and protecting internal organs, facilitating voluntary movements, maintaining posture, and contributing to overall physical endurance². It is formed sequentially from *Rakta Dhatu* through the action of *Mamsa Dhatvagni*, highlighting the importance of proper metabolic activity (*Agni*) in tissue nourishment and regeneration³.

Classical Ayurvedic texts emphasize that well-nourished *Mamsa Dhatu* is essential for effective wound healing (*Vrana Ropana*), restoration of damaged tissues, and maintenance of muscular strength (*Bala*)⁴. Any impairment in *Mamsa Dhatu* leads to clinical manifestations such as muscle wasting (*Mamsa Kshaya*), delayed healing, weakness, and susceptibility to injuries⁵. Conditions involving trauma, chronic illness, malnutrition, or excessive physical exertion are known to adversely affect the quality and quantity of *Mamsa Dhatu*⁶.

From a modern biomedical perspective, muscle regeneration and tissue repair are complex biological processes involving inflammation, proliferation of satellite cells, differentiation of myoblasts, angiogenesis, and extracellular matrix remodeling⁷. These processes require adequate nutrition, efficient cellular metabolism, and optimal circulation—concepts that closely resemble Ayurvedic principles of *Dhatu Poshana* and *Srotas* integrity⁸. The Ayurvedic understanding of tissue regeneration through nourishment and balance offers a holistic framework that complements modern regenerative biology.

Thus, exploring the role of *Mamsa Dhatu* in muscle regeneration and tissue repair provides an integrative understanding that bridges classical Ayurvedic concepts with contemporary scientific mechanisms. Such an approach can help in developing effective Ayurvedic therapeutic strategies aimed at enhancing muscle healing, improving tissue integrity, and restoring functional capacity in degenerative and traumatic conditions⁹.

Review: Role of *Mamsa Dhatu* in Muscle Regeneration and Tissue Repair

1. Concept of *Mamsa Dhatu* in Ayurveda

According to Ayurveda, *Mamsa Dhatu* is the fourth among the *Sapta Dhatu* and is primarily responsible for providing bulk, strength (*Bala*), stability, and

form to the body. It covers vital organs (*Koshtanga Avarana*), facilitates movements, and maintains posture. Classical texts describe *Mamsa Dhatu* as *Guru*, *Sthira*, and *Snigdha* in nature, which contributes to firmness and endurance of the body. *Mamsa Dhatu* is formed from *Rakta Dhatu* through the action of *Mamsa Dhatvagni*. Proper functioning of *Agni* ensures qualitative and quantitative formation of healthy muscle tissue. Any disturbance in this metabolic process results in either *Mamsa Kshaya* (depletion) or *Mamsa Vridhhi* (excess), both of which can impair normal tissue repair mechanisms.

2. *Mamsa Dhatu* and *Dhatu Poshana Nyaya*

Ayurveda explains tissue nourishment through principles such as *Ksheera-Dadhi Nyaya*, *Kedari-Kulya Nyaya*, and *Khale-Kapota Nyaya*. Muscle regeneration can be understood mainly through *Kedari-Kulya Nyaya*, where nutrients are supplied progressively through channels (*Srotas*) to nourish tissues. Proper potency of *Mamsavaha Srotas* is essential for effective delivery of nutrients required for muscle repair and regeneration.

Impairment of *Srotas* due to *Ama*, *Dosha Dushti*, or trauma results in delayed healing, fibrosis, or poor-quality tissue formation.

3. Role of *Mamsa Dhatu* in *Vrana Ropana* (Wound Healing)

Classical Ayurvedic texts clearly emphasize the role of *Mamsa Dhatu* in wound healing. After injury (*Vrana*), regeneration of muscle tissue is crucial for proper wound closure, restoration of function, and prevention of deformity. Adequate *Mamsa Dhatu* ensures:

- Faster granulation tissue formation
- Proper filling of wound gaps
- Restoration of tensile strength
- Prevention of chronic non-healing wounds

In conditions of *Mamsa Kshaya*, wounds become deep, chronic, and difficult to heal, whereas healthy *Mamsa Dhatu* supports rapid and effective tissue repair.

4. Pathological States of *Mamsa Dhatu*

Mamsa Kshaya

Characterized by muscle wasting, weakness, tremors, delayed healing, fatigue, and reduced physical strength. It is commonly seen in chronic diseases, malnutrition, excessive exercise, trauma, and aging.

Mamsa Vridhhi

Characterized by abnormal muscular growth, tumors (*Mamsa Granthi*), and conditions like *Arbuda*. Though excessive tissue is present, the quality of regeneration may still be defective.

Both conditions highlight that balanced *Mamsa Dhatu*—not merely its quantity—is essential for healthy regeneration.

5. Correlation with Modern Muscle Regeneration

Modern science explains muscle regeneration as a multi-step process involving:

- Inflammatory response
- Activation of satellite cells
- Proliferation and differentiation of myoblasts
- Protein synthesis and extracellular matrix remodeling

These processes require optimal nutrition, circulation, and metabolic efficiency, which closely align with Ayurvedic concepts of *Agni*, *Rakta-Mamsa Dhatu Poshana*, and *Srotas Shuddhi*. The concept of satellite cell activation parallels the Ayurvedic idea of latent regenerative potential within *Dhatu*, which becomes active when nourishment and balance are restored.

6. Therapeutic Approaches Supporting *Mamsa Dhatu*

Ayurveda advocates multiple therapeutic strategies to enhance muscle regeneration:

- *Brimhana Chikitsa* to promote tissue growth
- *Balya* and *Jeevaniya* drugs to enhance strength and vitality
- *Rasayana* therapy to improve cellular regeneration
- *Abhyanga* and *Swedana* to improve circulation and nutrient delivery
- Proper *Ahara* rich in protein-equivalent Ayurvedic foods like *Mamsarasa*, *Mudga*, *Ksheera*, and *Ghrita*

These measures collectively promote qualitative muscle repair and prevent degeneration.

7. Integrative Perspective

Understanding *Mamsa Dhatu* through both Ayurvedic and modern lenses provides a holistic framework for muscle regeneration and tissue repair. Ayurveda emphasizes systemic balance, metabolic efficiency, and nourishment, while modern science focuses on cellular and molecular mechanisms. Integration of both systems can enhance clinical outcomes in trauma, degenerative diseases, post-

surgical recovery, sports injuries, and age-related muscle loss.

Table 1: Classical Description of *Mamsa Dhatu* in Ayurvedic Texts

Aspect	Description
Position	4th <i>Dhatu</i> among <i>Sapta Dhatu</i>
Origin	Formed from <i>Rakta Dhatu</i>
Agni	<i>Mamsa Dhatvagni</i>
Dominant Mahabhuta	<i>Prithvi + Jala</i>
Guna	<i>Guru, Sthira, Snigdha</i>
Primary Function	Muscle bulk, protection, movement, strength
Upadhatu	<i>Vasa</i>
Mala	<i>Kha-mala</i> (ear, nose secretions)

Table 2: Functions of *Mamsa Dhatu* and Their Clinical Relevance

Ayurvedic Function	Description	Clinical Significance
<i>Sharira Poshana</i>	Provides bulk and shape	Maintains muscle mass
<i>Avarana</i>	Covers organs	Protects vital structures
<i>Cheshta</i>	Enables movement	Motor functions
<i>Bala</i>	Provides strength	Endurance & recovery
<i>Vrana Puran</i>	Fills wounds	Tissue repair

Table 3: *Mamsa Dhatu Dushti* – Causes and Manifestations

Type	Nidana (Causes)	Lakshana (Symptoms)
<i>Mamsa Kshaya</i>	Malnutrition, trauma, chronic illness, excessive exercise	Muscle wasting, weakness, delayed healing
<i>Mamsa Vriddhi</i>	Excessive <i>Brimhana Ahara</i> , Kapha dominance	Tumors, hypertrophy, heaviness
<i>Mamsa Pradoshaja Vikara</i>	<i>Dosha</i> imbalance	<i>Granthi, Arbuda, Adhimamsa</i>

Table 4: Correlation of *Mamsa Dhatu* with Modern Muscle Tissue

Ayurvedic Concept	Modern Correlation
<i>Mamsa Dhatu</i>	Skeletal muscle tissue
<i>Dhatvagni</i>	Cellular metabolism
<i>Dhatu Poshana</i>	Protein synthesis
<i>Srotas</i>	Microcirculation
<i>Vrana Ropana</i>	Tissue regeneration
<i>Balya</i>	Muscle strength

Table 5: Stages of Muscle Regeneration – Ayurvedic & Modern View

Stage	Modern Science	Ayurveda
Injury	Muscle fiber damage	<i>Abhigata</i>
Inflammation	Cytokine release	<i>Dosha Utklesha</i>
Proliferation	Satellite cell activation	<i>Dhatu Utpatti</i>
Remodeling	Fiber maturation	<i>Dhatu Sthirata</i>
Recovery	Functional restoration	<i>Bala Prapti</i>

Table 6: Role of *Agni* in Muscle Regeneration

Type of Agni	Role
<i>Jatharagni</i>	Digestion & nutrient availability
<i>Rakta Dhatvagni</i>	Precursor formation
<i>Mamsa Dhatvagni</i>	Muscle tissue formation
<i>Saman Vayu</i>	Nutrient assimilation

Table 7: Therapeutic Measures Supporting *Mamsa Dhatu*

Therapy	Action
<i>Brimhana Chikitsa</i>	Enhances muscle bulk
<i>Rasayana</i>	Cellular regeneration
<i>Abhyanga</i>	Improves circulation
<i>Swedana</i>	Removes <i>Srotorodha</i>
<i>Basti</i>	Systemic nourishment

Table 8: Dietary Factors Beneficial for *Mamsa Dhatu*

<i>Ahara Dravya</i>	Ayurvedic Action
<i>Mamsarasa</i>	Direct nourishment
<i>Ksheera</i>	<i>Balya, Brimhana</i>
<i>Ghrita</i>	<i>Dhatu Poshana</i>
<i>Mudga</i>	Muscle repair
<i>Shashtika Shali</i>	Strength promotion

Table 9: Conditions Associated with Impaired Muscle Regeneration

Condition	Ayurvedic Explanation
Sarcopenia	<i>Mamsa Kshaya</i>
Chronic wounds	<i>Dhatu Dushti</i>
Sports injury	<i>Abhigata + Vata</i>
Post-surgical healing	<i>Agni Mandya</i>
Degenerative disorders	<i>Vata Pradhana Vyadhi</i>

Table 10: Scope of *Mamsa Dhatu* in Clinical Practice

Area	Application
Orthopedics	Fracture & muscle healing
Sports medicine	Injury recovery
Geriatrics	Sarcopenia management
Surgery	Post-op healing
Rehabilitation	Muscle strengthening

II. DISCUSSION

The present review highlights the pivotal role of *Mamsa Dhatu* in muscle regeneration and tissue repair by integrating classical Ayurvedic concepts with contemporary scientific understanding. In Ayurveda, *Mamsa Dhatu* is regarded as the primary structural tissue responsible for strength (*Bala*), stability, and protection of vital organs. Its balanced formation and maintenance are considered essential for effective healing and restoration of damaged tissues. The classical view that healthy *Mamsa Dhatu* depends upon proper *Agni*, sequential nourishment from *Rakta Dhatu*, and unobstructed *Srotas* provides a comprehensive framework to understand muscle repair mechanisms.

Muscle regeneration, as described in modern science, involves a sequence of inflammation, cellular proliferation, differentiation, and remodeling. These stages closely resemble the Ayurvedic description of tissue repair following *Abhigata*, where initial *Dosha Utklesha* is followed by *Dhatu Utpatti* and eventual *Dhatu Sthirata*. The concept of *Mamsa Dhatvagni* regulating the quality of muscle tissue formation parallels cellular metabolism and protein synthesis essential for regeneration. When *Agni* is impaired, inadequate or poor-quality tissue formation occurs, leading to delayed healing and weakness, which is clinically observed in conditions of *Mamsa Kshaya*.

The role of *Mamsa Dhatu* in *Vrana Ropana* is particularly significant. Classical texts emphasize

that proper filling of wounds and restoration of tissue continuity depend on the qualitative formation of *Mamsa Dhatu*. This aligns with modern concepts of granulation tissue formation, collagen deposition, and tensile strength development during wound healing. In chronic or non-healing wounds, the Ayurvedic explanation of *Dhatu Dushti* and *Srotorodha* provides insight into why regeneration fails despite apparent tissue presence.

Therapeutic measures described in Ayurveda, such as *Brimhana Chikitsa*, *Balya* and *Rasayana* therapies, directly target the enhancement of *Mamsa Dhatu*. These interventions not only promote muscle bulk but also improve tissue quality and regenerative capacity. Practices like *Abhyanga* and *Swedana* improve circulation and facilitate nutrient delivery, comparable to improved perfusion and oxygenation required for tissue repair in modern medicine. Dietary measures emphasizing *Mamsa Dhatu Poshaka Ahara* ensure sustained availability of nutrients essential for muscle regeneration, reinforcing the importance of nutrition in healing processes.

From an integrative perspective, the Ayurvedic approach to muscle regeneration extends beyond localized tissue repair and emphasizes systemic balance. By addressing *Agni*, *Dosha*, and *Dhatu* simultaneously, Ayurveda offers a holistic model that complements modern regenerative biology. This integrated understanding can be particularly valuable in managing trauma, post-surgical recovery, degenerative muscle disorders, sports injuries, and age-related muscle loss.

Overall, the discussion establishes that *Mamsa Dhatu* is not merely a structural entity but a dynamic tissue governed by metabolic and nutritional factors. Its balanced state is fundamental for effective muscle regeneration and tissue repair. Bridging Ayurvedic principles with modern scientific concepts enhances the clinical relevance of *Mamsa Dhatu* and supports the rational use of Ayurvedic therapies in contemporary musculoskeletal and rehabilitative medicine.

III. CONCLUSION

Mamsa Dhatu plays a fundamental and dynamic role in maintaining muscular integrity, promoting muscle regeneration, and facilitating effective tissue repair.

Ayurveda emphasizes that the qualitative and quantitative formation of *Mamsa Dhatus* depends on proper functioning of *Agni*, sequential nourishment from *Rakta Dhatus*, and unobstructed *Mamsavaha Srotas*. Any imbalance in these factors leads to impaired regeneration, delayed wound healing, and loss of muscular strength, as seen in conditions of *Mamsa Kshaya*.

The Ayurvedic concepts of *Dhatu Poshana*, *Vrana Ropana*, and *Brimhana Chikitsa* closely parallel modern biological processes such as protein synthesis, satellite cell activation, and tissue remodeling. This correlation highlights the scientific relevance of classical Ayurvedic descriptions in understanding muscle repair and regeneration. Therapeutic approaches aimed at enhancing *Mamsa Dhatus* through appropriate diet, *Rasayana*, *Balya* therapies, and *Panchakarma* procedures offer a holistic strategy for restoring muscle health.

In conclusion, maintaining the balance of *Mamsa Dhatus* is essential not only for structural strength but also for efficient regenerative capacity of tissues. An integrative approach that combines Ayurvedic principles with modern medical insights can provide effective and sustainable solutions for musculoskeletal disorders, trauma care, post-surgical recovery, and degenerative muscle conditions. This underscores the enduring relevance of Ayurveda in the field of regenerative and rehabilitative medicine.

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