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ANATOMICAL UNDERSTANDING OF *PESHI* IN THE LIGHT OF *SHARIRA RACHANA*

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ABSTRACT

The concept of *Peshi* (muscles) in *Sharira Rachana* holds pivotal importance as one of the primary structural entities derived from *Mamsa Dhatu*. *Acharya Sushruta* has enumerated approximately 520 *Peshis*, describing their regional distribution, morphological diversity, and functional significance, especially in relation to *Marma Sthanas*. Classical texts elucidate the formation of *Peshi* through the action of *Pitta-yukta Vayu* on *Mamsa Dhatu*, thereby organizing muscle bundles into distinct units that provide *Bala* (strength), *Avaṣṭambha* (support), and protection to *Asthi* (bones), *Sandhi* (joints), *Sira* (vessels), and *Snayu* (ligaments/tendons). Further, *Ayurveda* recognizes their dual role in *Icchanuvṛtta* (voluntary) and *Anicchanuvṛtta* (involuntary) activities, correlating with modern skeletal, smooth, and cardiac muscle physiology. In contemporary anatomical perspective, muscles are specialized contractile tissues of mesodermal origin, comprising nearly 40–50% of body weight, enclosed by connective tissue sheaths—endomysium, perimysium, and epimysium—that facilitate nourishment, innervation, and biomechanical integration. Their classification into skeletal, smooth, and cardiac muscles aligns with the *Ayurvedic* distinction of voluntary and involuntary *Peshis*, highlighting functional similarities. Thus, the *Ayurvedic* view of *Peshi* not only presents a structural delineation but also emphasizes functional, protective, and clinical aspects, reflecting a holistic understanding of musculature. A

comparative approach reveals convergence between classical insights and modern anatomical descriptions, thereby validating the relevance of *Sharira Rachana* in comprehending musculoskeletal and neuromuscular health.

KEYWORDS: *Sharira Rachana, Peshi, Mamsa Dhatu, Sushruta Samhita*, Muscle anatomy.

INTRODUCTION

Sharira Rachana (Ayurvedic human anatomy) forms the cornerstone of *Ayurvedic* medical education and clinical practice. It deals with the structural organization of the body, including *Asthi* (bones), *Peshi* (muscles), *Sira* (vessels), *Snayu* (ligaments), *Marma* (vital points), *Sandhi* (joints) and other anatomical entities. The study of *Rachana Sharir* is not limited to descriptive anatomy, but extends towards applied and functional understanding with clinical relevance. *Acharya Charaka* emphasizes the importance of body knowledge through the dictum –"*Dharma–Artha–Kama–Mokṣaṇam Arogyaṃ Moolam Uttamam.*[1] stated that "*Dharma, Artha, Kama and Mokṣha* are founded upon *Arogya* (health) This implies that the realization of the four *Purusharthas* is possible only through the integrity of the *Sharira*. *Sharira* serves as the essential medium for the attainment of *Purusharthas* Similarly, *Acharya Sushruta*, the Father of Surgery, considered the detailed knowledge of *Sharira* essential for successful surgical practice and described anatomical structures with remarkable precision.[2] Within the domain of *Sharira Rachana*, the study of *Peshi* (muscles) holds particular importance, as they constitute one of the primary structural units of the body. Modern anatomy regards them as specialized contractile tissues comprising nearly 40–50% of total body weight which are broadly classified into skeletal, smooth, and cardiac muscles each playing a vital role in locomotion, posture, circulation, and visceral activities. The study of *Peshi* is important not only for understanding structural design but also for correlating physiology and clinical conditions associated with musculoskeletal and neuromuscular systems.

AIMS AND OBJECTIVES

1. To study the classical description of *Peshi* in *Sharira Rachana* with special reference to *Acharya Sushruta.*
2. To compare *Ayurvedic* understanding of *Peshi Nirman, Sankhya,* and *Karya* with modern anatomical concepts of muscle.

MATERIAL AND METHOD

1. Literary review of *Ayurvedic Samhitas* (*Sushruta, Charaka, Ashtanga Sangraha, Sharangadhara*) and their commentaries.
2. Comparative analysis with modern anatomy using standard textbooks (Gray's Anatomy, Inderbir, MacIntosh et al.).
3. Analytical and descriptive method for correlating *Ayurvedic* and modern anatomical perspectives of muscle morphology, classification, and function.

LITERARY REVIEW OF PESHI (MUSCLE)

Rachana Sharira" (रचनाप्रतिपादकं शारीरं रचनाशारीरम्) is also termed as *Pratyaksha Sharira*, is the branch of *Ayurveda* concerned with the structural composition of the human body. In contemporary science, this domain corresponds to Anatomy. As described in classical texts, *Rachana Sharira* imparts knowledge of the organization and arrangement of various *Avayava* (organs) and *Pratyanga* (sub-organs). It emphasizes the understanding of *Asthi* (bones), *Sira* (veins), *Dhamani* (arteries), *Mamsa / Peshi* (muscles), *Hridaya* (heart), and other vital structures. The discipline not only delineates their position Sthana (position), Aakara (size), and Swaroopa morphological features (morphological features), but also highlights their topographical relationships with adjoining structures. Furthermore, *Rachana Sharira* provides a systematic account of the *Samsthana* (specialized body systems) and the *Nadi* (nervous supply) that ensures nutrition and functional integration. Thus, while *Ayurveda* presents these concepts in holistic and functional terms whereas modern anatomy complements this knowledge with detailed structural and microscopic descriptions.[3] Among these, *Peshi* (muscles) represent a vital structural as well as functional entity of the body. They are considered to be a derivative of *Maṃsa Dhatu* according to *Ayurvedic* tradition.

The term *Peshi* is etymologically derived from *Pishita*, which denotes that which is divided into limbs and organs i.e., flesh or muscular tissue. It originates from the root "*Piṅsh"* (*Pinshati Avayavau Bhavati Iti*, meaning that which becomes separated into distinct parts.[4]

DISCUSSION

A. Peshi Nirmaan

1. According to *Acharya Sushruta*, Just as *Pitta-yukta Vayu* (*Vata* associated with *Pitta*) opens the *Srotas* (body channels) according to its functional requirement, in the same way, the same *Pitta-yukta Vayu* penetrates the *Mamsa Dhatu* (muscle tissue) and divides

it into distinct units known as *Peshi* (muscles).[5] Whereas in modern anatomy, Muscle tissue is made up basically of cells that are called myocytes. Myocytes are elongated in one direction and are, therefore, often referred to as muscle fibres. Myocytes are mesodermal in origin. Each muscle fibre is closely invested by connective tissue that is continuous with that around other muscle fibres. Because of this fact the force generated by different muscle fibres gets added together. In some cases a movement may be the result of simultaneous contraction of thousands of muscle fibres. The connective tissue framework of muscle also provides pathways along which blood vessels and nerves reach muscle fibres.[6]

2. In his commentary, *Acharya Dalhana* further clarifies it as *"Vayuh Pishitam Mamsam Anupravishya Peshi Vibhajate, Peshi Manshkhanda*", suggesting that the action of *Vata* subdivides the muscle mass into compact units called *Peshi*. He further elaborates: *"Mamsa-Avayava-Sanghataḥ Parasparam Vibhaktaḥ Peshi Ityucyate"* which means *Peshi* is a collection of structural subdivisions of *Mamsa* that are distinctly separated from one another.[7]

3. *Sharangadhara* further elaborates

"***Maṃsapeshyo balaya Syuravaṣṭambhaya Dehinam /***

Pishitamanupravisya Peshirvibhajatenilaḥ ॥"

Maṃsa-Peshi (Muscle bundles) provide *Bala* (strength) and*Avaṣṭambha* (support) to the living body. The *Vayu* (bio-force) enters into the *Pishita* (flesh) and divides it into distinct muscular units, thereby giving rise to the *Peshi.*[8]

B. *Peshi Swaroop/Aakriti* (Morphology)

1. According to the classical description (*Ashtaang Sangraha*) *Peshi* (muscles) are considered analogous to *Snayu* (ligaments/tendinous structures) in their structural diversity. Just as *Snayu* may present in various forms— Gola (rounded), Chapati (flat), or Pratanavati (expanded)—similarly, *Peshi* also exhibit multiple morphological patterns.[9]
2. *Acharya Chakrapanidatta* defines them as "*Deergha Maṃsa-Peshi Akara*" (elongated muscular structures).[10]
3. According to *Acharya* Ghanekar (commentator of *Sushruta Samhita*), the *Maṃsa-khaṇḍa* (muscle masses), which are termed as Peshi due to their division by the activity of *Vayu*, exhibit **multiple varieties** based on their site and function. The *Mamsa-khaṇḍa* (muscle

masses), which serve as coverings for the *Asthi* (bones), *Sandhi* (joints), *Sira* (veins), and *Snayu* (tendinous or ligamentous structures), exhibit a wide range of morphological variations.[11] They are described as :

Comparative Understanding of *Peshi (Ayurveda)* and Muscles (Modern Anatomy)

Ayurvedic* Description of *Peshi	**Characteristic Feature**	**Modern Anatomical Correlation / Example**
Bahal (Large)	Very large muscle mass	Gluteus maximus
Alpa – Small	Small-sized muscle	Palmar interossei
Sthoola – Thick	Thick and bulky muscle	Masseter
Aṇu – Thin	Slender, fine muscle	Stapedius (smallest), Palmaris brevis
Pṛthu – Flat / Broad	Flat and wide muscle	Pectoralis major, Latissimus dorsi
Vṛtta – Round	Rounded	Orbicularis oculi
Kaṭhina-sadṛsa – Hard / Firm	Tough, firm-textured muscle	Temporalis (fibrous density)
Hrasva – Short	Short-length muscle	Adductor brevis, Interossei
Dirgha – Long	Elongated muscle	Sartorius (longest muscle)
Sthira – Firm / Stable	Provides firmness and stability	Erector spinae group
Mṛdu – Soft	Softer texture muscle	Palmaris brevis,Patysma
Slakṣṇa – Smooth	Smooth and less fibrous	Risorius
Karkasa – Rough / Coarse	Rough or coarse in feel	Tendo-muscular junction regions

C. *Peshi Sankhya* (Muscle Enumeration)

In *Ayurvedic* literature, particularly as per *Acharya Sushuta* (Suśruta Saṃhitā, Śārīrasthāna 5/37), the number of *Peshi* (muscles) in the human body is precisely stated as 500 in males and 520 in females, These are distributed as follows:

- *Shakha* (extremities / limbs) – 400
- *Vaksh*a and *Udara* (trunk / thorax & abdomen) – 66
- *Greeva* and *Shira* (neck and head region) – 34

Thus, making a total of 500 *Peshis* (muscles) in the male body.[12] Also *Acharya Sushruta* explicitly states – "*Striṇam Tu Viṃsatiradhika*" – meaning, in females there are 20 extra *Peshis*, 5–5 in each *Stana* (breast) and 10 in the *Garbhashaya* (uterus) of women.[13]

On the other hand, in modern anatomy, the number of muscles in the human body does not have a fixed or universally agreed figure. Standard textbooks describe that human body has more than 600 muscles, but the number may vary depending on whether certain small, accessory, or variable muscles are included or excluded.[14]

Acharya Sushruta's approach provides a rounded, systematic numerical classification of *Peshi* with a functional and regional distribution (*Shakha*, *Vakṣa-Udara*, *Greeva-Sira*) whereas modern anatomy emphasizes detailed identification and individual variation in musculature.

D. *Peshi Vargikarana* / Classification of Muscle

Just as in a *Yantra* (mechanical device) all movements occur through the Chakra (wheel/axis), similarly in the *Sharira* (human body), diverse activities such as *Chalana* (walking), *Vihara* (moving), *Vak-pravṛtti* (speech), *Rodana* (crying), *Gayana* (singing), *Hasta-utthana* (raising of hands), *Netra-unmilana* and *Nimilana* (opening and closing of eyes), *Malamutrotsarga* (defecation and micturition), *Svasa* (respiration), *Hṛdaya-spandana* (heartbeat), *Anna-gamana* (peristaltic movement of food through the *Mahastrota* /Gastrointestinal tract), and *Taraka-Maṇḍala Vikara* (pupillary constriction and dilation) are all carried out by *Maṃsa* or *Peshi* (muscular structures).

These activities are divided into two types

- *Icchanuvṛtta Gati* (Voluntary movements) – under the control of will, such as walking, moving, speaking, or raising the limbs. These muscles are innervated by somatic nerves.
- *Anicchanuvṛtta Gati* (Involuntary movements) – beyond conscious control, such as the heartbeat, peristalsis, or pupillary reflexes.

Accordingly, two types of *Maṃsatantu* (muscle fibers) are described

- *Icchanuvṛtta Maṃsa* / Voluntary Muscles (Skeletal muscles) – attached to bones and performing locomotor activities. These muscles are innervated by somatic nerves.
- *Anicchanuvṛtta Maṃsa* / Involuntary Muscles (Smooth muscles and Cardiac muscle) – functioning independently of will. These muscles are innervated by autonomic nerves.

1) Distribution

- Involuntary muscles are located in the *Annapraṇali* (oesophagus to rectum), *Mutrasaya* (urinary bladder), ureters, *Kaṇṭha-nadi* (bronchi and their branches), *granthi-nali* (ducts of glands), *Aṣṭhila* (prostate), *Sukrashaya* (seminal vesicle), *Sukra-pranali* (vas deferens), *Bijagranthi* (testis), *Bija-vahini* (spermatic duct), *Garbhasaya* (uterus), *Rakta-vahini* (arteries), *Lasika-vahini* (lymphatics), *Hṛidaya* (heart), *Nayanataraka-Maṇḍala* (iris), *Sandhan-peshika* (ciliary muscle), *Romakupa* (hair follicles), *Sveda-granthi* (sweat glands), scrotal skin, *Stana-chuchuka-maṇḍala* (areola), and *Pliha* (spleen).

- Voluntary muscles predominate in *Asthi-sambaddha Peshi* (skeletal musculature attached to bones).[15]

2) Microscopic features of Muscle

- Voluntary muscle fibers (striated skeletal muscle): long **(~1 inch), cylindrical**, rounded at ends, **multinucleated**, with alternating light and dark striations. Hence termed striped muscles.
- Involuntary muscle fibers (smooth muscle): shorter **(~1/600 inch),** fusiform, single nucleus, lacking transverse striations, hence termed non-striated. However, longitudinal striations may be present.
- Cardiac muscle (*Hṛdaya-Maṃsa*): although involuntary, shows striations like skeletal muscle.[16]

3) Special features of involuntary muscles

- *Aniccha-anurodhitva* (independence from will) – they cannot be consciously started or stopped.
- *Tala-baddhata* (rhythmicity): a unique property whereby contraction and relaxation follow a regular rhythmic pattern, as seen in the *Hṛdaya* (heart), *Antra* (intestines), and *Garbhashaya* (uterus).

As *Sushruta* States

"*Tad Sankochaṃ Vikasaṃ ch svataḥ kuryat punaḥ punaḥ*" means The heart contracts and relaxes repeatedly on its own). Each involuntary *Peshi* exhibits its own rhythmic cycle. From this description, it becomes clear that *Ayurveda* accommodates both voluntary and involuntary muscles within the concept of *Peshi*.[17]

Features of Skeletal, Cardiac and Smooth muscle fibers[18]

Features	Skeletal muscle	Cardiac muscle	Smooth muscle
Location	In association with bones	In the heart	in the visceral organs
Shape	**Cylindrical** and unbranched	Branched	Spindle-shaped, unbranched
Length	1 cm to 4 cm **(1 inch = 2.54 cm)**	80 µ το 100 µ	50 µ το 200 µ 50 micrometer ≈ 0.002 inch **(approx 1/500 inch)**
Diameter	10 µ το 100 µ.	15 µ το 20 µ	2µ 1ο 5 µ
Number of nucleus	**More than one**	one	**one**

Cross-striations	Present	Present	Absent
Action	Voluntary action	Involuntary action	Involuntary action
Control	Neurogenic	myogenic	Neurogenic and myogenic
Nerve supply	Somatic nerves	Autonomic nerves	Autonomic nerves

E. *Peshi-Karya* / Function of muscle

Acharya Sushruta describes that the *Sira* (veins), *Snayu* (ligaments/tendons), *Asthi-Parva* (bony prominences/joints), and *Sandhi* (articulations) of the Sharira (human body) are enveloped and supported by *Peshi* (muscular tissue). Owing to this muscular covering, these vital structures attain *Bala* (strength, stability, and protection).[19]

According to modern literature, Each muscle fibres is surrounded by delicate connective tissue that is called the endomysium. Individual fasciculi are surrounded by a stronger sheath of connective tissue called the perimysium. The entire muscle is surrounded by fibrous connective tissue called the **epimysium** (protective sheath).[20] The epimysium surrounds, or envelops the muscle, separating it from the surrounding organs and tissues. It separates the muscle from adjacent structures and provide a pathway for the blood vessels and nerves that supply nourishment and innervations to the muscle tissue. The contraction of muscle requires a vast amount of energy; therefore, an extensive vascular network is necessary in order to deliver this energy to the muscle tissue, and in addition to carry away the by-products (i.e., metabolic waste) of the muscle contraction. The epimysial nerves will innervate the skeletal muscle fascicles and the muscle fibers within them, carrying the signal required to initiate contraction of the muscle tissue.[21] These three collagenous sheaths, unite and fuse where the muscles connect to adjoining structures such as tendons.[22]

This classical *Ayurvedic* observation highlights the protective and reinforcing role of muscles, which correlates with modern anatomical concepts of the musculoskeletal system. Muscles provide dynamic stabilization to joints, cushion and shield vascular structures, and cover bony prominences to prevent injury, thereby fulfilling both structural and functional roles. Thus, *Sushruta's* description reflects an early understanding of the integrated biomechanics of the human body. The entire muscle is surrounded by connective tissue called the epimysium. At the junction of a muscle with a tendon the fibres of the endomysium, the perimysium and the epimysium become continuous with the fibres of the tendon.

CONCLUSION

The concept of *Peshi*, as elucidated in *Sharira Rachana*, represents not merely the structural manifestation of *Mamsa Dhatu*, but also a dynamic entity ensuring *Bala* (strength), *Avaṣṭambha* (support), and *Pariposhana* (protection and nourishment) of vital structures such as *Asthi* (bones), *Sandhi* (joints), *Sira* (vessels), and *Snayu* (ligaments/tendons). *Acharya Sushruta's* description of approximately 520 *Peshis*, their morphological diversity, functional attributes, and clinical relevance in relation to *Marma sthanas*, reflects an advanced anatomical insight with significant surgical implications.

When correlated with modern anatomy, *Peshi* corresponds to muscular tissue, derived from the mesoderm, organized into skeletal, smooth, and cardiac muscles. The modern description of connective tissue coverings – endomysium, perimysium, and **epimysium** – reinforces the *Ayurvedic* notion of muscles as protective coverings that stabilize, nourish, and safeguard adjoining structures.

Thus, the study of *Peshi* in *Ayurveda* highlights an integrated approach, where *Sharira Rachana* not only provides structural delineation but also emphasizes functional and clinical perspectives. This comparative understanding bridges the classical *Ayurvedic* concepts with contemporary anatomical knowledge, affirming that the *Peshi* (muscle) is a vital component of the *Sharira* (body) which upholds both structural integrity and physiological functionality, ultimately serving as the substratum for maintaining health and supporting life activities.

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