

## A Critical Review Study on Concept of Peshi Described in Ayurveda with Special Reference to Modern Myology

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### Abstract

Ancient seers of Ayurveda have classified the elements of the body under three fundamental components: *Dosha*, *Dhatu* and *Mala*. Among these basic elements Dhatus are especially meant for *Dharana & Poshana of Sharira*. When all the above factors act in harmony, it is defined as *Swastha* (health). *Peshi* is the important part of body which covers the framework of body, which supports and helps the body for any type of movements. Knowledge of *Peshi* can be traced back from *Vedas* passing chronologically down to *Samhitas*. But the scholars preoccupied themselves with only supporting parts of human skeleton.

There is enough evidence of knowledge of *Peshi Sharir* (Myology) in the ancient India but in Sutra Rupa or in dispersed form. Starting from Pre-*Vedic* period, *Vedic* period and *Samhita-kala* period all have some what description of *Peshi Sharir* but not in mannered way. Due to different principles, faiths and way of learning, there may be some differences or lacunas from present-day knowledge. Collection and critical analysis of various concepts related to *Peshi Sharir* as per modern headings like definitions, constituents, embryology, types, uses and clinical aspects. Thus an effort is undertaken to understand *Peshi Sharir* and its concepts in scientific way. Though there may be some differences or lacuna's from nowadays knowledge but, we can have proud on our glorified past of knowledge in every medicinal field especially regarding knowledge of *Peshi Sharir*.

The *ayurvedic* literature regarding *Peshi Sharir* and modern anatomical literature were studied to find out correlating structures. Comparative study between facts of Ayurveda and modern anatomy were done by visualization with the help of dissection study. For anatomical study of *Peshi* this dissection based study is most important because main references of *Peshi* is from *Suśruta samhita* which is an surgically oriented literature and facts said in it are supposed to be confirmed by or even discovered by the process of dissection. In the same chapter where *Peshi* is described, *Acharya Sushruta* also stated importance of dissection based study and visualization by following verse

**Keywords:** Peshi; Muscles; Myology; Mamsa; Mamsadhatu; Mamsadhara kala.

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### Introduction

Comprehensive information of the body structures is necessary for the well being of human body. After getting knowledge about the structures of the body, one is able to know about factors which are useful

to our body. Hence the detail knowledge of the body is commended by the experts. The physician who knows the details of body parts does not get confused due to ignorance. The incomplete and faulty knowledge always harms the beneficiary. *Acharya Sushruta*, the great Indian surgeon of 2<sup>nd</sup> Century A.D.; wrote a comprehensive book on the

subject of surgery on every part of human body. He had knowledge of the *Shadanga Sharir* regarding its structure based on dissection of cadavers. He was pioneer in the work of revealing structures of human body, before attempting surgery on living subject. Hence, *Sushruta* very rightly stressed the need of the thorough knowledge. *Acharya* also mentioned *Anga-Pratyanga* (sub parts) which are present in *Shadanga Sharir*.<sup>1</sup> *Acharya Charaka* mentioned 56 *pratyanga* which are attached to the 6 main parts of the body.<sup>2</sup>

*Peshi* are the compact form of *Mamsa Dhatu*, having muscle fibers are arranged side by side and separated from each other. *Peshi* are lengthy and have fleshy appearance. *Pitta Yukta Vayu* enters the *Mamsa* and then divides it into *Peshi*. It is component of body mainly composed of *Mamsa Dhatu*. So the study is required to bring more clarity into the concept of *Peshi Sharir*. Most of treatises provide the brief knowledge regarding the *Peshi*, but *Acharya Sushruta* mentioned more in details about the types, location, distribution, nature and functions of *Peshi*. *Peshi* are nothing but the *Sanghata Bheda* of *Mamsa Dhatu*. The term *Peshi* is not mentioned as such in the oldest testament of the world. In *veda*, term *māmsa* is used instead of *Peshi* while in *purāna*, particularly in *Agni Purāna* the term *Peshi* is mentioned and the count of *Peshi* are also enumerated i.e. five hundred. *Acharya Charaka* has also followed the pattern of *veda* and *upanishad* and has not given the detail description of *Peshi*. *Sushruta* has mentioned the number of *Peshi* and also gave the development, distribution, function and types of *Peshi*. He also gave the description about the twenty extra *Peshi* in female, but none of the *Acharya* has given the detail analysis of these twenty extra *Peshi*. *Acharya Vagbhata* has also followed *Sushruta*.<sup>3</sup> In modern anatomy muscles are studied as a separate branch names as "mycology". *Peshi* is the component part of the body which is derived from the *Mamsa Dhatu*. It wraps the body like a sleeve, covers the *Sira*, *Snayu*, *Asthi* and *Sandhi* thus provides the smooth contour to the body.

### Development of *Peshi*

According to *Ayurveda*, during fetal development *Vata Dosha* enters the *Mamsa Dhatu* and divides it into *Peshi*. In accordance with the development of *Peshi*, *Vata Dosha* along with *Pitta* enters the *Mamsa Dhatu* and splits it into component parts. The Indian literature, *Veda*, as it is claimed, is eternal and believed to be the revelation of divine wisdom pertaining to every sphere of knowledge,

which unfolds the method of approach to truth and reality, apply to all sciences, arts and philosophy. The subject matter described in *Veda* are in the form of *Sutra* and carry deep theme in the subject concerned when analyzed and understood in proper perspective. A complete realization of the great and true *Vedic* knowledge can only be obtained after getting merged into it. The ancient Indian methodology and its secret techniques as depicted in *Vedic* hymns still deserve a good deal of analysis and exploration.

In *Ayurvedic* treatise, the matter related to the *Peshi Sharir* is not thoroughly described. The description about the *Peshi* is not available in *Veda*. In *Upanishada* instead of description of *Peshi* the word *mamsa* has been given. In *Agni Purana* it is mentioned that *Mamsa* is derived from *Matrija Bhava*. While counting the number of *Peshi* is mentioned that 500 *Peshi* are present in the human body. In *Garua Purana* it is mentioned that one *Sahastra Pal Mamsa* is present in human body. In *Yadnyaawalakya Smriti* *Peshi* is said to be cylindrical and fleshy part of the body and they are 500 in number.<sup>2</sup> In *Ayurveda* the *Peshi* has been described in detail. The description of number, division, shape and structure is also available. There is controversy about the structure of *Peshi* among the commentators and authors. According to *Acharya Charaka* in the second month of embryonic period *Garbha* becomes *Ghana Mamsa*. This *Ghana Mamsa*, if appears as *Pinḍa* (oval shape) then the gender of product of conception will be male, if as *Peshi* form (elongated muscles/spindle shape) then female and if in *Arbuda* shape (tumor shape) then *Napumsaka* will be born.<sup>4</sup>

According to *cakrapani* the long fibers of *mamsa* is call as *Peshi*. According to *Sushruta* *Pitta* along with *vayu* opens the *Srotas* when needed. In the same way *Pitta* along with *vayu* when enters into *mamsa* it divides it into *Peshi*. *Acharya Dalhana* mentions that when *Mamsa* gets separated, the separated part is known as *Peshi*. According to *Indu* (Commentator of *Aastanga ga Sangraha*) *Peshi* are of different shape like that of *Snayu* and is same as *mamsa* while *Sharnghadhara* opines that *mamsa Peshi* gives strength to the body and when *Vayu* enters into it, it divides into *Peshi*. According to *Bhavamishra* *Mamsa* is formed by the action of *mamsagni*. As *Vayu* with the help of *ushma* forms all *srotas* of the body, so it forms the *Mamsa Peshi* rom *mamsa dhatu*.<sup>5</sup>

### Distribution of the *Peshi* According to Different *Acharya*

According to *Charaka* the total number of *Peshi* present in human beings are four-hundred in

number. During embryological development, in the second month the embryo becomes a hard mass or a long fleshy mass like a *Peshi* or a round ball.

*Chakrapani* the commentator of *Charaka Samhita* has given the detail description about the formation and nutrition of *Mamsa Dhatu*.

**Table 1:** Shows the number of *peshi* mention by different *acharaya*

S. No.	Name of Acharaya	Number of Peshi
1	<i>Sushruta</i>	500
2	<i>Charaka</i>	400
3	<i>Ashtangaga Samgraha</i>	500
4	<i>Ashtangaga Hridaya</i>	500
5	<i>Bhavapraksha</i>	500
6	<i>Sharangadhara</i>	500
7	Modern science	519

**Table 2:** Shows the distribution of *peshi* in *Shadanga Sharir* by *Acharya sushruta* and *Ashtanga samgraha*<sup>6</sup>

S. No.	Region of the body	<i>Acharya sushrut</i>	<i>Ashtanga samgraha</i>	Modern medical science
1	<i>Shakha</i>	400	400	236
2	<i>Koshtha</i>	66	60	135
3	<i>Jatrurdhva</i>	34	40	148

**Table 3:** Shows the distribution of *Peshi* in *Shakha (extremity)* by *Acharya Sushrut* and *Ashtanga Samgraha*

S. No.	Part of Shakah (extremity)	<i>Acharya Sushruta</i>	<i>Ashtanga Samgraha</i>
1	<i>Anguli</i>	3 × 5 = 15	3 × 5 = 15
2	<i>Prapada</i>	10	10
3	<i>Padopari</i>	10	10
4	<i>Gulpha</i>	10	10
5	<i>Padatala</i>	-	10
6	<i>Jangha</i>	20	20
7	<i>Janu</i>	5	5
8	<i>Uru</i>	20	20
9	<i>Vankshana</i>	10	-

**Table 4:** Shows the distribution of *Peshi* in *Koshtha (trunk)* by *Sushruta* and *Ashtanga Samgraha*<sup>7</sup>

S. No.	Part of Koshta (trunk)	<i>Acharya Sushruta</i>	<i>Ashtanga Samgraha</i>
1	<i>Medhra</i>	1	1
2	<i>Sevani</i>	1	1
3	<i>Vrishana</i>	2	2
4	<i>Sphik</i>	10	10
5	<i>Guda</i>	3	3
6	<i>Vastishira</i>	2	2
7	<i>Udar</i>	5	4
8	<i>Nabhi</i>	1	1
9	<i>Hridaya</i>	1	1
10	<i>Amashaya</i>	1	1
11	<i>Yakrita, pliha, unduka</i>	6	6
12	<i>Prishtordhva</i>	10	5
13	<i>Parshva</i>	6	10
14	<i>Vaksha</i>	10	10
15	<i>Akshakamsa</i>	7	3

**Table 5:** Shows the distribution of *Peshi* in *Jatrurdhva* (Head Neck and Face) by *Sushruta* and *Ashtanga Samgraha*

S. No.	<i>Jatrurdhva</i> (Head Neck and Face)	<i>Acharya Sushruta</i>	<i>Ashtanga Samgraha</i>
1	<i>Griva</i>	4	10
2	<i>Hanu</i>	8	8
3	<i>Kakalaka</i>	1	1
4	<i>Gala</i>	1	1
5	<i>Talu</i>	2	2
6	<i>Jihva</i>	1	1
7	<i>Oshtha</i>	2	2
8	<i>Nasa</i>	2	2
9	<i>Netra</i>	2	-
10	<i>Ganda</i>	4	8
11	<i>Karna</i>	2	2
12	<i>Lalata</i>	4	2
13	<i>Shir</i>	1	1

**Table 6:** Shows the types of *Peshi* and their meaning in present circumstances

S. No.	Type of <i>Peshi</i>	Dr. Ghanekar	M. Monier Williams Dictionary
1	<i>Bahala</i>	Large	Thick, Dense, Compact, Firm, Solid, Wide And Extensive Etc. (P. No. 724)
2	<i>Pelava</i>	Small	Delicate, Soft, Fine, Tender, <i>Kalid</i> , Thin, Slim And Slender. (P. No. 648)
3	<i>Anu</i>	Thin	Fine, Minute, Atomic, Anatom Of Matter, An Atom Of Time. (P. No. 11)
4	<i>Sthula</i>	Thick	Large, Thick, Stout, Massive, Bulky, Big, Huge, Coarse, Gross And Rough. (P. No. 1266)
5	<i>Prithu</i>	Broad	Broad, Wide, Expansive, Extensive, Spacious And Large. (P. No. 646)
6	<i>Vritta</i>	Dome Shaped or Sphincter	Turned, Set In Motion, Round, Circular, Rounded And Continued. (P. No. 1009)
7	<i>Hrsva</i>	Short	Short, Small, Dwarfish, Little, Low, Weak, Unimportant And Insignificant. (P. No. 1307)
8	<i>Dirgha</i>	Long	Long, Lofty And High. (P. No. 481)
9	<i>Sthira</i>	Firm	Firm, Hard, Solid, Compact Strong, Fixed, Immovable, Motionless, Still And Calm. (P. No. 1264)
10	<i>Mridu</i>	Soft	Soft, Delicate, Tender, Pliant, Mild, Gentle, Weak, Feeble And Slow (Gait). (P. No. 830)
11	<i>Shlakshma</i>	Smooth	Internal Support (P. No. 43) And Uniting Metal (P.No. 908)
12	<i>Karkasha</i>	Rough	Hard, Firm, Rough And Harsh. (P. No. 256)

### **Anatomical Structures in Close Relation with *Peshi***

Structures like *Mamsadhara Kala*, *Snayu*, *Kandara*, *Jala*, *Kurcha* and *Mamsa Rajju* are related to *Peshi* and different ways. *Kala* is the limit or boundary between the *Dhatu* and its *ashaya*. Meaning of the Sanskrit word *Kala* is a part or portion of anything. Its composition varies according to its location; may be a *snayu*, *jarayu* or *sheshma*. *Mamsadhara Kala* is the first *kala*, within this *Kala* the network of *Sira*, *Snayu*, *Dhamani* and *Srotas* has been spread. *Acharya Sushruta* has compared the anatomical picture of *Mamsadhara Kala* with that lotus of stalk present in muddy water.

### **Extra *Peshi* in Female**

It is a well-known fact that the text of *Ayurveda* is not in detail instead found in *Sutra Rupa* specially the *Sharir Rachana*. Our great scholars should have described in reference to context but a lapse in the development of *Ayurvedic* science was a causative factor to give the above impression. Word *Peshi* in *Ayurveda* has been used to denote fascia, muscle, tendon and ligament; etc. in different contexts. There are 20 extra *Peshi* in women, among them ten are in *Stana* (Breast) that is five in each breast and ten are related to *Yoni* (Uterus along with vagina). *Sushruta* and *Vagbhata* both have described that there are 20 extra *Peshi* in female. Presences of



extra ten *Peshi* are being mentioned in females at *yonis*. Four are present in *apatyapatha*, out of which two spread inside and two outer circular *Peshi*, are situated at the orifice of the canal. The *Garbhachidra* contains three *Peshi* and other three are present in *shukrartavapraveshini* place. There are differences of opinion among *ayurvedic* scholars in considering the classification of *Peshi* as some include fascia, muscle, tendon; etc. These may be the muscle situated at introitus, vagina, uterus and fallopian tubes.

According to modern literature anatomically and histologically the bulbospongiosus muscles are different in two sexes. In the male they arise from the central perineal tendon and from the median raphe and curve antero-superiorly round the bulb and posterior part of the corpus spongiosum. The posterior fibers pass round the bulb of the perineal membrane. The middle fibers encircle the corpus in other raphe, dorsal to it. The anterior fibers pass round the corpus spongiosum and the corpora cavernosa and emit dorsal to the penis. In the female the fibers also arise from the central perineal tendon but sweep round the sides of the vestibule over the inferior surface of the greater vestibular gland and the vestibule (the female equivalent of the corpus spongiosum) to be inserted into the sides and dorsum of the clitoris.

## Discussion

*Peshi* are made up mainly of *mamsa Dhatu*. It is a long mass of flesh. Morphology of *mamsa* as explained by the *acharya Gananatha Sena* as *Peshi* are mostly like structure as of a rope being thick at center and thin at end parts. Some are also of different structure like *koshakara*, *nalakakara*, *sutrakara*, *rajjavakara*, *talavrantakara* and *sharapunkhakara*. These *rajjavakara*, *talavrantakara* and *sharapunkhakara* have two ends. These ends may be *Snayumaya*. In these ends which end is above and fixed is called *Prabhava* or origin and that end below is called *Nivesha* or insertion point. According to modern anatomical science, skeletal muscle comprises centrally located muscle belly with two narrowed end called tendons. The term *Kandara* is used for denoting tendons. Structure of *Kandara* is explained as white glistening ends of *Peshi* looking silver white in color and is capable of bearing weight. This *Kandara* can be either included under *Peshi* or *Snayu*. *Sushruta* explained rounded and enlarged *snayu* as *Kandara*. From above discussion it is clear that *Peshi* are made up of and representatives of *Mamsa Dhatu* in body so we can include all the muscular structures

situated in body. Here two muscular structures are present – muscle bellies and tendon. Muscle or *Peshi* is itself representatives of *Mamsa Dhatu* and *Kandara*, which either can be included under *Peshi* and *Snayu*, is used in the meaning of muscle tendon as thickened *Snayu* are called *Kandara*.

In accordance with the development of *Peshi*, *Vata Dosh*a along with *Pitta* enters the *Mamsa Dhatu* and splits it into component parts.

In modern anatomy Limb and Axial muscles developed by epitheliomesenchymal transformation from myogenic precursor cells. Myogenic precursor cells originate from the somatic mesoderm and from the ventral dermomyotome of somites in response to molecular signals from nearby tissues. The first indication of myogenesis is the elongation of the nuclei and cell bodies of mesenchymal cells fuse to form elongated, multinucleated, cylindrical structures i.e. myotubes. At the molecular level, these events are preceded by gene activation and expression of the *MyoD* family of muscle-specific, basic helix-loop-helix transcription factors in the precursor myogenic cells. Retinoic acid enhances skeletal myogenesis by upregulating the expression of mesodermal markers and myogenic regulatory factors. It has been suggested that signaling molecules and others from the dorsal neural tube and overlying ectoderm regulate the beginning of myogenesis and the induction of myotome. Further muscle growth in the fetus results from the ongoing fusion of myoblasts and myotubes. During or after fusion of myoblasts, myofilaments develop in the cytoplasm of the myotubes. Other organelles characteristic of striated muscle cells, such as myofibrils, also form. As the myotubes develop, they become invested with external laminae, which segregate them from the surrounding connective tissue. Fibroblasts produce the perimysium and epimysium layers of the fibrous sheath of the muscle; the endomysium is formed by the external lamina and reticular fibers. Most skeletal muscles develop before birth and almost all remaining ones are formed by the end of first year. The increase in the size of a muscle after the first year results from an increase in the diameter of the fibers because of the formation of more myofilaments. Muscles increase in length and width to grow with the skeleton. Their ultimate size depends on the amount of exercise that is performed. Not all embryonic muscle fibers persist; many of them fail to establish themselves as necessary units of the muscle and soon degenerate.<sup>7</sup> The musculature of the limbs develops from myoblasts surrounding the developing bones. The myoblasts form a mass

of tissue on the dorsal or extensor and ventral or flexor aspects of the limbs. Grafting and gene targeting studies in birds and mammals have demonstrated that the precursor myogenic cells in the limb buds originate from the somites.<sup>8</sup> These cells are first located in the ventral part of the dermomyotome and are epithelial in nature. After epitheliomesenchymal transformation, the cells then migrate into the primordium of the limb.<sup>9</sup> In Ayurveda classification of *Peshi* can be correlated with various types of muscles explained in modern medical science as follows

#### ***Bahala and Pelava***

In this category, we considered those muscles which are thick and thin in density.

#### ***Prithu and Vritta***

In *prithu* category, we considered those muscles which are broad and wide or extend in large area. In *Vritta* category considered which are circular, sphincter and domeshaped.

#### ***Hrsva and Dirgha***

In this category, we considered those muscles which are short and long respectively in length and height.

#### ***Sthira and Mridu***

In *Sthira* category, we considered those muscles which have long tendinous part and belly part is short. In *Mridu* category is just opposite to *Sthira* i.e. tendinous part short and belly part is more than *Sthira*

#### ***Shlakshna and Karkasha***

In *Shlakshna* category, we considered those muscles which have smooth origin or insertion. In *Karkasha* category, we considered rough origin and insertion

#### ***Sthula and Anu***

In *Sthula* category, we considered those muscles which are large and *Anu* category considered those muscles which are small. Another view in this category is that *Sthula* category; we considered those muscles which we can see easily by naked eyes and in *Anu* category considered those muscles which we did not see easily with naked eye. In *Sthula* category we include all the skeletal muscles and in *Anu* category we include smooth muscles of viscera and arteries. So in *Ayurveda*, *Peshi* are classified or named on the basis of their size, shape, action and the feeling of touch like thick or thin, short or long are on the basis of size; wide/thick or

round/circular are on the basis of their structure; fix/stable or movable are on the basis of their movement; hard or soft, smooth or rough are on the basis of perception of touch. In modern science the nomenclature of muscles is also based on same features. These are following:

#### ***Shape of Muscle***

Some skeletal muscles are imaginatively named for their shapes. For example the deltoid muscle—resembles a “triangle” quadratus femoris muscle shows quadrant shape. Other example is the orbicularis oris and the orbicularis oculi—resembles little orbit or little circle. These little orbits are generally referred to as sphincter muscles. A sphincter muscle is a circular muscle that constricts narrows or closes off, a body opening.<sup>10</sup>

#### ***Size of Muscle***

Some skeletal muscles are imaginatively named for their size. Eg. Major (big)—pectoralis major, Minor (small)—pectoralis minor, Longus (long)—adductor longus, Brevis (small)—palmaris brevis etc.<sup>12</sup>

#### ***Number of Muscle Heads***

The biceps brachii and biceps femoris, the literally meaning of biceps is two heads. Other examples are triceps brachii— “three-heads”, quadriceps femoris- “four heads” etc.

#### ***Action or Movement of the Muscle***

Some skeletal muscles are named according to their action like, Extensor-Extensor carpi radialis, Flexor-Flexor carpi radialis, Abductor—Abductor pollicis longus, Adductor-Adductor magnus etc.

#### ***Position of the Muscle***

Some muscles are named according to their position like, Anterior (front)—Tibialis anterior, Posterior (back)—Tibialis posterior, Supra (above)—Supraspinatus, Infra (below)—Infraspinatus etc.

#### ***Depth of the Muscle***

Name of the muscles has been indicates the location of the muscle whether it is superficial, deep, exterior or interior in respective of body parts like, Superficialis (superficial)—Flexor digitorum superficialis, Profundus (deep)—Flexor digitorum profundus etc. In this way we can say that the basic concept for study and classification of myology is same in ayurveda and in modern medical science which was given by the seers of *Ayurveda*. The above

mentioned concept, description and classifications of *Peshi* are described by *Acharya Sushruta*. This indicates his accuracy in clinical diagnosis.<sup>11</sup>

## Conclusion

Such a detailed knowledge of *Peshi* is necessarily presupposes a careful study of human Myology since the *Vedic* period. This shows that the knowledge of Myology was fairly advanced in ancient period. Literal and fundamental work has sole aim to relate and convert the ages old knowledge into more clinician friendly as per terms of this new era but to retain its principles and its basics. Thus in this article we have collected various concepts related to *Peshi Sharir* as per modern era like definitions, constituents, embryology, types, uses and clinical aspects. Though there may be some differences or lacuna's from nowadays knowledge but, we can have proud on our glorified past of knowledge in every medicinal field especially in *Peshi Sharir* Knowledge.

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