

**CLASSIFICATION OF MUSCLES ACCORDING TO THEIR MORPHOLOGY  
DESCRIBED IN SUSHRUTA SAMHITA W.S.R. TO “तासां बहलपेलवस्थूलाणु....”****Dr. Teena Jain\*<sup>1</sup> Dr. Sunil Kumar Yadav<sup>2</sup>**<sup>1</sup>Lecturer, Dept. of *Sharir Rachana*, Kalawati Ayurvedic Medical College & Hospital, Gorha, Kasganj.<sup>2</sup>Assistant Professor, Dept. of *Sharir Rachana*, NIA, Jaipur.**\*Corresponding Author: Dr. Teena Jain**Lecturer, Dept. of *Sharir Rachana*, Kalawati Ayurvedic Medical College & Hospital, Gorha, Kasganj.

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**ABSTRACT**

*Peshi* are component of body mainly composed of *mamsa dhatu*. During fetal development *vata dosha* enters the *mamsa dhatu* and divides it into *peshi*. *Peshi* are thick or thin, big or minute, stout/thick or round/circular, short or long, fix/stable, hard or soft, smooth or rough; they cover the *sandhi*, *asthi*, *sira* and *snayu*, in their places naturally. The morphology of *peshi* differs according to their locations and functions. Skeletal muscle, also called striated muscle, is a dense, fibrous contractile tissue which exists throughout the body, and functions to allow body movements by applying force to bones and joints, via contraction. In human, there are approximately 640 muscles and almost all are symmetrically distributed between the left and right sides of the body. Size and shape of different muscles are highly variable depending on their functions throughout the body.

**KEYWORDS:** *Peshi*, Muscle, Morphology.**INTRODUCTION**

*Peshi*, the component part of the body 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.<sup>[1]</sup>

*Peshi* 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 centre 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.<sup>[2]</sup>

**Morphology of *Peshi*<sup>[3,4]</sup>**

The size and shape of *peshi* differs according to their location and function.

1. ***Bahala*** – According to *Dalhana* ‘बहला बहुतराः’  
According to *Ghanekara bahala* means large. According to M. Monier Williams Dictionary- the meanings of *bahala* are thick, dense, compact, firm, solid, wide and extensive etc.<sup>[5]</sup>
2. ***Pelava***- According to *Dalhana* ‘पेलवा अल्पाः’  
According to *Ghanekara pelava* means small. According to M. Monier Williams Dictionary- the

meanings of *pelava* are delicate, soft, fine, tender, *kalid*, thin, slim and slender.<sup>[6]</sup>

3. ***Anu***- According to *Dalhana* ‘अणवाः सूक्ष्माः’  
According to *Ghanekara anu* means thin. According to M. Monier Williams Dictionary- the meanings of *anu* are fine, minute, atomic, anatom of matter, an atom of time.<sup>[7]</sup>
4. ***Sthula*** - According to *Dalhana* ‘तद्विपरीताः स्थूलाः’  
means opposite to *anu*.  
According to *Ghanekara sthula* means thick. According to M. Monier Williams Dictionary- the meanings of *sthula* are large, thick, stout, massive, bulky, big, huge, coarse, gross and rough.<sup>[8]</sup>
5. ***Prthu***- According to *Dalhana* ‘पृथ्वो विस्तीर्णाः’  
According to *Ghanekara prthu* means flat or broad. According to M. Monier Williams Dictionary- the meanings of *prthu* are broad, wide, expansive, extensive, spacious and large.<sup>[9]</sup>
6. ***Vrtta***- According to *Dalhana* ‘वृत्ताः वर्तुलाः’  
According to *Ghanekara vrtta* means dome shaped or sphincter. According to M. Monier Williams Dictionary- the meanings of *vrtta* are turned, set in motion, round, circular, rounded and continued.<sup>[10]</sup>
7. ***Hrswa***- According to *Dalhana* ‘ह्रस्वा अदीर्घाः’  
According to *Ghanekara hrswa* means short. According to M. Monier Williams Dictionary- the meanings of *hrswa* are short, small, dwarfish, little, low, weak, unimportant and insignificant.<sup>[11]</sup>

8. **Dirgha**- According to *Dalhana* 'दीर्घा आयताः'  
According to *Ghanekara* *dirgha* means long.  
According to M. Monier Williams Dictionary- the meanings of *dirgha* are long, lofty and high.<sup>[12]</sup>
9. **Sthira** - According to *Dalhana* 'स्थिराः कठिनाः'  
According to *Ghanekara* *sthira* means firm.  
According to M. Monier Williams Dictionary- the meanings of *sthira* are firm, hard, solid, compact strong, fixed, immovable, motionless, still and calm.<sup>[13]</sup>
10. **Mrdu**- According to *Dalhana* 'मृदुवः कोमलाः'  
According to *Ghanekara* *mrdu* means soft.  
According to M. Monier Williams Dictionary- the meanings of *mrdu* are soft, delicate, tender, pliant, mild, gentle, weak, feeble and slow (gait).<sup>[14]</sup>
11. **Shlaksna**- According to *Dalhana* 'श्लक्षणाः स्पर्शसुखाः'  
According to *Ghanekara* *shlaksna* means smooth.  
According to M. Monier Williams Dictionary- the meanings of *shlaksna* are internal support<sup>[15]</sup> and uniting metal.<sup>[16]</sup>
12. **Karkasha**- According to *Dalhana* 'तद्विपरीताः कर्कशाः'  
means opposite to *shlaksna*.  
According to *Ghanekara* *karkasha* means rough.  
According to M. Monier Williams Dictionary- the meanings of *karkasha* are hard, firm, rough and harsh.<sup>[17]</sup>

## DISCUSSION

*Acharya Sushruta* described the size and shape of the *peshi* according to their location and function:

- 1) **Bahala and pelava**- In this category, we considered those muscles which are thick and thin in density. Following muscles considered in this category-

**Table no. 1: Correlation of muscles with bahala and pelava type of peshi.**

<i>Bahala</i>	<i>Pelava</i>
1. Psoas major	1. Tensor veli palatini
2. Iliacus	2. Levator veli palatini
3. Three vasti muscles	3. Palatoglossus
4. Adductor magnus	4. Palatopharyngeus
5. Gluteus maximus	5. Musculus uvulae
6. Gluteus medius	6. External, internal and innermost intercostal muscles
7. Gluteus minimus	7. Ischiocavernous
8. Biceps femoris	8. Superficial and deep transverse perineal muscles
9. Gastrocnemius	9. Diaphragm
10. Soleus	10. Rectus abdominis
11. Flexor digitorum longus	11. Gracilis
12. Flexor digitorum profundus	12. Obturator externus
13. Trapezius	13. Scalenus anterior, medius and posterior
14. Lattisimus dorsi	14. Palmaris brevis
15. Triceps brachii	15. Serratus posterior superior and inferior
16. Extensor digitorum	16. Extensor pollicis longus
17. Pectoralis major	17. Extensor indicis
18. Biceps brachii	18. Platysma
	19. Abductor pollicis
	20. Flexor carpi radialis
	21. Flexor carpi ulnaris

- 2) **Prthu and vrta**- In *prthu* category, we considered those muscles which are broad and wide or extend in large area. In *vrta* category considered which are circular, sphincter and domeshaped.

**Table no. 2: Correlation of muscles with prthu and vrta type of peshi.**

<i>Prthu</i>	<i>Vrta</i>
1. Diaphragm	1. Orbicularis oculi
2. External oblique abdominis	2. Orbicularis oris
3. Internal oblique abdominis	3. External sphincter urethrae
4. Transverse abdominis	4. Bulbospongiosus
5. Levator ani	5. Compressor urethrae
6. Quadratus lumborum	6. Sphincter urethrovaginalis
7. Obturator internus	

8. Quadratus femoris	
9. Popliteus	
10. Quadratus plantae	
11. Splenius capitis	
12. Occipitofrontalis	
13. Temporalis	
14. Pronator quadratus	
15. Trapezius	
16. Lattisimus dorsi	
17. Rhomboid major	
18. Serratus posterior superior and inferior	
19. Platysma	
20. Pectoralis major	
21. Serratus anterior	

3) *Hrsva and dirgha*- In this category, we considered those muscles which are short and long in length and height. Following muscles considered in this category-

**Table no. 3: Correlation of muscles with *hrsva* and *dirgha* type of *peshi*.**

<i>Hrsva</i>	<i>Dirgha</i>
1. Medial pterygoid	1. Rectus abdominis
2. Lateral pterygoid	2. Psoas major
3. Tensor veli palatini	3. Sartorius
4. Levator veli palatini	4. Quadriceps femoris-4
5. Palatoglossus	5. Gracilis
6. Palatopharyngeus	6. Adductor longus
7. Musculus uvulae	7. Adductor magnus
8. Genioglossus	8. Biceps femoris
9. Hyoglossus	9. Semimembranosus
10. Styloglossus	10. Semitendinosus
11. Cricothyroid	11. Gastrocnemius
12. Thyroarytenoid	12. Soleus
13. Posterior cricoarytenoid	13. Tibialis posterior
14. Lateral cricoarytenoid	14. Flexor digitorum longus
15. Transverse and oblique arytenoids	15. Flexor hallucis longus
16. Vocalis	16. Peroneus brevis
17. Salpingopharyngeus	17. Peroneus longus
18. Stylopharyngeus	18. Tibialis anterior
19. External, internal and innermost intercostal muscles	19. Extensor hallucis longus
20. Transversospinales	20. Extensor digitorum longus
21. Levator costarum	21. Flexor digitorum superficialis
22. Piriformis	22. Flexor digitorum profundus
23. Adductor brevis	23. Flexor pollicis longus
24. Pectineus	24. Triceps brachii
25. Tensor fasciae latae	25. Brachioradialis
26. Peroneus tertius	26. Extensor carpi radialis longus
27. Extensor digitorum brevis	27. Extensor carpi radialis brevis
28. Extensor hallucis brevis	28. Extensor digitorum
29. Abductor hallucis	29. Extensor digiti minimi
30. Flexor digitorum brevis	30. Extensor carpi ulnaris
31. Abductor digiti minimi	31. Abductor pollicis longus
32. Flexor hallucis brevis	32. Extensor pollicis longus
33. Adductor hallucis	33. Extensor indicis
34. Flexor digiti minimi	34. Biceps brachii
35. Splenius capitis and cervicis	35. Flexor carpi radialis
36. Rectus capitis posterior major	36. Flexor carpi ulnaris
37. Rectus capitis posterior minor	
38. Obliquus capitis inferior	
39. Obliquus capitis superior	

40. Scalenus anterior, medius and posterior 41. Suprahyoid muscle- Sternohyoid, superior belly of omohyoid, sternothyroid and thyrohyoid 42. Infrahyoid muscle- Mylohyoid, geniohyoid, anterior belly of digastric, stylohyoid 43. Masseter 44. Thenar muscle- Flexor pollicis brevis, abductor pollicis brevis, opponens pollicis and adductor pollicis 45. Hypothenar muscle- Abductor digiti minimi, flexor digiti minimi brevis, opponens digiti minimi 46. Palmar and dorsal interossei, lumbricals 47. Levator scapulae 48. Rhomboidus major, minor 49. Serratus posterior superior, inferior 50. Anconeus 51. Supinator 52. Coracobrachialis 53. Pronator teres 54. Supraspinatus, infraspinatus, teres minor, teres major, subclavius 55. Superficial and deep transverse perineal muscles	
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4) ***Sthira and mrdu***- In *sthira* category, we considered those muscles which have long tendinous part and belly part is short. In *mrdu* category is just opposite to *sthira* i.e. tendinous part short and belly part is more than *sthira*.

**Table no. 4: Correlation of muscles with *sthira* and *mrdu* type of *peshi*.**

<i>Sthira</i>	<i>Mrdu</i>
1. Plantaris	1. Gluteus maximus
2. Palmaris longus	2. Gluteus medius
	3. Gluteus minimus
	4. Pectoralis major
	5. Biceps brachii
	6. Triceps brachii
	7. Gastrocnemius
	8. Soleus
	9. Diaphragm
	10. Latissimus dorsi

5) ***Shlaksna and karkasha*** - In *shlaksna* category, we considered those muscles which have smooth origin or insertion. In *karkasha* category, we considered rough origin and insertion.

**Table No. 5: Correlation of muscles with *shlaksna* and *karkasha* type of *peshi*.**

<i>Shlaksna</i>	<i>Karkasha</i>
1. Platysma	1. Erector spinae
2. Occipitofrontalis	2. Transversospinales
3. Temporalis	3. Interspinales
4. External oblique, internal oblique, transverse abdominis.	4. Intertransversarii
	5. Serratus anterior
	6. External, internal and innermost intercostal muscles.

6) ***Sthula and anu***- In *sthula* category, we considered those muscles which are large and *anu* category considered those muscles which are small.

**Table no. 6: Correlation of muscles with *sthula* and *anu* type of *peshi*.**

<i>Sthula</i>	<i>Anu</i>
1. Gluteus maximus	1. Stapedius
2. Gastrocnemius	2. Tensor tympani
3. Pectoralis major	3. Lumbricals
4. Quadriceps femoris	4. Interossei
	5. Multifidus
	6. Rotators

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.

In modern science the nomenclature of muscles is also based on same features. These are following:-

1. **Shape** – Some skeletal muscles are imaginatively named for their shapes. Eg. The deltoid muscle – resembles a “triangle”. Other example is the orbicularis oris and the orbicularis oculi- resembles a “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. Other example is rhomboid major- resembles a “diamond-shape”.

2. **Size** – 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.
- 3. Number of muscle heads-** Eg. 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”.
- 4. Action or movement – Eg.**
- ▶ Extensor- Extensor carpi radialis
  - ▶ Flexor- Flexor carpi radialis
  - ▶ Abductor- Abductor pollicis longus
  - ▶ Adductor- Adductor magnus.
- 5. Position – Eg.**
- ▶ Anterior (front)- Tibialis anterior
  - ▶ Posterior (back)- Tibialis posterior
  - ▶ Supra (above)- Supraspinatus
  - ▶ Infra (below)- Infraspinus.
- 6. Depth – Eg.**
- ▶ Superficialis (superficial)- Flexor digitorum superficialis
  - ▶ Profundus (deep)- Flexor digitorum profundus
  - ▶ Externus (external)- External oblique
  - ▶ Internus (internal)- Internal oblique.

## CONCLUSION

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 this way we can say that the basic concept for study and classification of myology was given by the seers of *Ayurveda*.

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