WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.63
Volume 15, Issue 5, 1677-1683. Review Article ISSN 2277–7105

# INTEGRATIVE ANATOMICAL APPRAISAL OF PRISHTA SHARIR WITH SPECIAL REFERENCE TO THE MORPHOMETRIC FRAMEWORK OF THE VERTEBRAL COLUMN

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Article Received on 05 Feb. 2026,
Article Revised on 25 Feb. 2026,
Article Published on 01 March 2026,

https://doi.org/10.5281/zenodo.18884798

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**How to cite this Article:** [1]Dr. Pooja Makhnotra*, [2]Dr. Kartik Goel. (2026). Integrative Anatomical Appraisal Of Prishta Sharir With Special Reference To The Morphometric Framework of The Vertebral Column World Journal of Pharmaceutical Research, 15(5), 1677–1683.



## ABSTRACT

Prishta Sharir represents the posterior anatomical division of the human body as described in classical Ayurvedic literature. Within this region, Merudanda is conceptualized as the central axial pillar responsible for structural stability, locomotion, and neurofunctional coordination. In modern anatomy, the vertebral column is recognized as a segmented osteoligamentous structure consisting of 33 vertebrae, organized into cervical, thoracic, lumbar, sacral, and coccygeal regions. This conceptual analytical study presents a systematic integrative appraisal correlating classical Ayurvedic textual descriptions with contemporary morphometric parameters of the vertebral column. The article explores embryological development, regional specialization, biomechanical characteristics, curvature indices, and clinical implications. Structured tables and a conceptual flowchart are incorporated to develop a coherent integrative research framework. The study aims to establish a scientifically grounded morphometric model that preservestextual authenticity while enabling objective anatomical interpretation within the discipline of Rachana Sharir.

## 1. INTRODUCTION

Prishta Sharir, the posterior anatomical region described in Ayurvedic literature, holds substantial structural and functional importance. Classical Acharyas identified the posterior

trunk as the sustaining axis of the body.[2] Merudanda, often equated with the vertebral column, is metaphorically described as the Sthambha (pillar) that maintains bodily integrity.[1] Modern anatomical science similarly defines the vertebral column as the central axis of the axial skeleton, providing attachment for ribs and musculature, protecting the spinal cord, and maintaining posture and balance. The conceptual convergence between classical Ayurvedic thought and contemporary anatomical science offers significant scope for integrative anatomical research.[7]

The present study aims to systematically analyze Prishta Sharir through textual, structural, morphometric, developmental, and clinical perspectives, thereby proposing a conceptual morphometric framework for future empirical research.

## 2. Classical Ayurvedic Review

According to Sushruta Samhita (Sharira Sthana 5/3), Prishta is defined as the posterior region of the body supported by Merudanda. The text emphasizes the spine as the principal structural axis of the back, essential for posture and locomotion.[1]

Classical descriptions depict Merudanda as centrally located and structurally organized. The Sharira Sthana elaborates upon the posterior body region and highlights the presence of Majja within Asthi structures. Similarly, Charaka Samhita underscores structural integration and physiological coordination mediated through posterior support systems.[2]

**Key classical concepts include**

- **Merudanda** as Dharana (supportive axis)
- **Majja** as nutritive and neurofunctional substance
- **Sandhi** as facilitators of movement
- **Asthi** as the structural framework

These categories demonstrate strong conceptual correspondence with vertebral bodies, spinal canal, intervertebral articulations, and supporting ligaments described in modern anatomy.

**3. Embryological and Developmental Correlation:** Embryologically, the vertebral column develops from paraxial mesoderm through somite formation. Sclerotomal differentiation gives rise to vertebral bodies and associated structures.[8]

The Ayurvedic concept of Dhatu Parinama (gradual tissue transformation) may be interpreted parallel to sequential vertebral ossification and maturation. Postnatal spinal curvature development reflects functional adaptation.

- Cervical lordosis develops during head control.
- Lumbar lordosis develops with upright posture and ambulation.
- Thoracic kyphosis represents the primary curvature.

These biomechanical adaptations resonate with the Ayurvedic principle of functional segmentation and adaptive structural stability.

## 4. Modern Morphometric Parameters

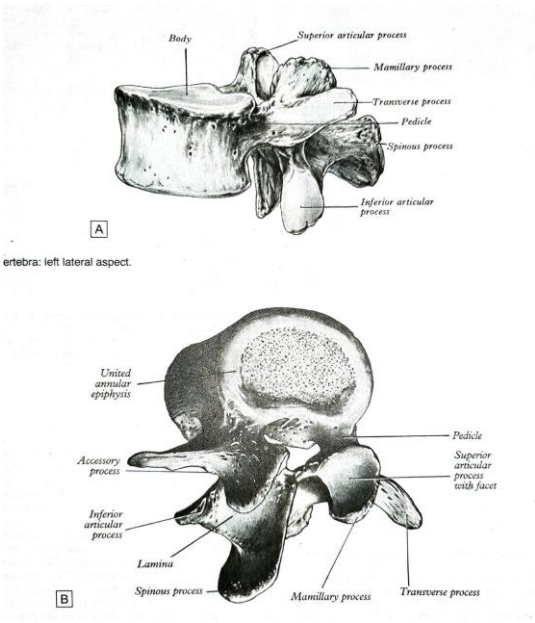


**Fig.1**

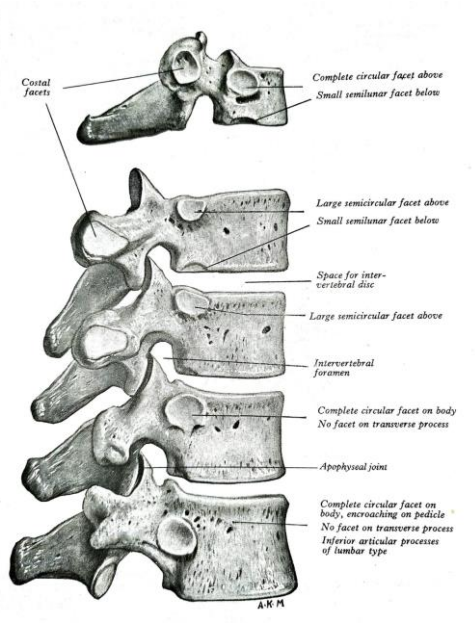


**Fig-2**

Figure 1 (**Morphological Features of a Typical Lumbar Vertebra (Lateral and Superior View)**)[11] illustrates the structural components of a typical lumbar vertebra demonstrating the vertebral body, pedicle, lamina, spinous process, transverse process, superior and inferior articular processes, mamillary process, and accessory process. These anatomical landmarks form the structural basis for morphometric assessment including vertebral body height, pedicle thickness, and articular orientation.

Figure 2 (**Regional Variations in Thoracic Vertebrae with Costal Facets**)[11] depicts thoracic vertebrae demonstrating complete and demifacets for rib articulation, intervertebral foramen, and apophyseal joints. The presence and arrangement of costal facets reflect

regional specialization of the vertebral column and support functional segmentation described in classical literature.

Morphometric evaluation of the vertebral column includes:

- Vertebral body height (anterior, middle, posterior)
- Sagittal and transverse diameters
- Pedicle thickness
- Spinous process length
- Intervertebral disc height
- Cobb's angle for curvature assessment.

Such parameters allow quantitative assessment of spinal alignment, load transmission, and curvature dynamics. Ayurvedic descriptors such as Sthirata (stability) and Gati (mobility) may be objectively correlated with curvature indices and vertebral proportions, thereby forming a measurable integrative anatomical framework.

**5. Structured Integrative Table**

| Ayurvedic Term | Description | Modern Correlation |
|---|---|---|
| Merudanda | Central axial support | Vertebral column |
| Asthi | Structural tissue | Osseous framework |
| Majja | Marrow and neural component | Spinal cord and bone marrow |
| Sandhi | Articulation | Facet joints |

**6. Conceptual Flowchart: Integrative Framework**

Prishta Sharir (Posterior Anatomical Division)
↓
Merudanda (Central Axial Structural Unit)
↓
Structural Components (Asthi – Majja – Sandhi – Snayu)
↓
Regional Segmentation (Cervical – Thoracic – Lumbar – Sacral – Coccygeal)
↓
Morphometric Parameters
• Vertebral Body Height
• Sagittal & Transverse Diameter
• Pedicle Thickness
• Intervertebral Disc Height
• Curvature Indices (Cobb's Angle)
↓
Functional Outcomes
• Dharana (Support)
• Gati (Mobility)

• Sthirata (Stability)
• Neural Protection
↓
Clinical Correlation
• Katigraha
• Prishta Shoola
• Postural Disorders
• Degenerative Changes

## 7. DISCUSSION

The integrative analysis demonstrates that classical Ayurvedic anatomical descriptions exhibit significant observational precision. Although classical texts lack numerical quantification, they articulate clear structural hierarchy and functional specialization. Modern morphometry enables objective validation of vertebral dimensions, curvature patterns, and load distribution. By mapping Ayurvedic functional descriptors onto measurable anatomical indices, future studies may design cadaveric, radiological, or anthropometric research models that integrate textual authenticity with statistical methodology. Such interdisciplinary integration enhances academic credibility, strengthens research methodology, and improves publication potential in indexed journals within the domain of Rachana Sharir and integrative anatomical sciences.

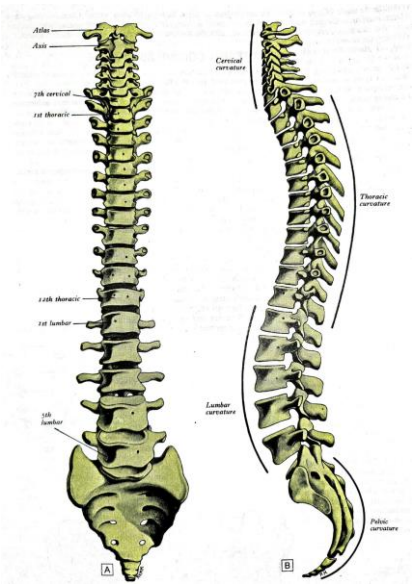


**Fig.3** **Fig.4**

Figure 3: **(Regional Segmentation and Physiological Curvatures of the Vertebral Column)**[11] demonstrates the vertebral column in anterior and lateral views highlighting cervical, thoracic, lumbar, and pelvic curvatures. These physiological curves contribute to

load transmission, balance maintenance, and biomechanical stability corresponding to the Ayurvedic principles of Dharana and Sthirata.

Figure 4 **(Sagittal View of Vertebral Column Demonstrating Neural Axis and Curvature)**[11] shows a sagittal representation of the vertebral column and spinal cord illustrating vertebral alignment, intervertebral disc spaces, and curvature dynamics. This image correlates structural integrity with neural protection and functional stability.

## 8. CONCLUSION

Prishta Sharir, when examined through integrative morphometric principles, emerges as a structurally and functionally coherent anatomical entity closely corresponding to the vertebral column described in contemporary anatomy. Classical depictions of Merudanda as the central supportive axis demonstrate conceptual alignment with modern understanding of vertebral segmentation, curvature biomechanics, load transmission, and neural protection. While numerical measurements are absent in classical literature, the structural organization and functional categorization reflect precise anatomical insight. By correlating Ayurvedic principles such as Dharana, Sthirata, and Gati with quantifiable morphometric parameters including vertebral dimensions and curvature indices, a scientifically robust integrative framework can be established. The proposed conceptual morphometric model provides a systematic foundation for future empirical investigations while maintaining textual integrity and scholarly rigor in Rachana Sharir.

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