

MRTA SAMSODHANA: AN ANCIENT AYURVEDIC APPROACH TO CADAVERIC STUDY AND ITS RELEVANCE TO MODERN ANATOMY

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ABSTRACT

The concept of *Mrta Samsodhana*, described by *Acharya Sushruta*, represents one of the earliest and most systematic approaches to anatomical education through cadaveric study. It embodies the profound blend of scientific inquiry and spiritual reverence that characterizes *Ayurvedic* learning. *Acharya Sushruta* emphasized direct observation (*Pratyakṣagyana*) as essential for understanding human anatomy and for the development of surgical skills. The process involved selection of an appropriate cadaver, purification (*Sodhana*), preservation by the *Jala-Majjana* (water immersion) method, and gradual dissection (*Śava Chedana*) using natural brushes rather than sharp instruments. This unique approach allowed students to visualize muscles, vessels, ligaments, and internal structures systematically while maintaining sanctity toward the human body. In contrast to modern embalming and dissection techniques employing chemical preservation and surgical

instruments, the ancient method relied on natural decomposition and gentle mechanical cleaning. Though lacking modern tools, it demonstrated remarkable anatomical insight and scientific understanding. Revisiting the principles of *Mrta Samsodhana* not only highlights the depth of ancient Indian anatomical knowledge but also reinforces the importance of

experiential learning, ethical respect, and holistic understanding in medical education. This review thus bridges the historical and philosophical continuum between ancient *Ayurvedic* and modern anatomical sciences.

KEYWORDS: *Mr̥ta Saṃsodhana*, *Sushruta Saṃhita*, *Shava Sodhana*, *Shava Saṃrakṣaṇa*, Cadaveric Dissection, *Ayurvedic* Anatomy.

INTRODUCTION

The study of human anatomy forms the cornerstone of medical education, serving as the foundation for understanding the structure and function of the human body. In *Ayurveda*, this aspect is explored through the profound concept of *Mr̥ta Saṃsodhana* — the systematic study and dissection of the human cadaver as described by ancient sages.

Classical texts, especially the *Sushruta Saṃhita*, emphasize that direct observation and examination of the human body are essential for acquiring practical anatomical knowledge and surgical precision. *Acharya Sushruta* detailed a meticulous method for cadaveric preparation, preservation, and dissection that parallels modern anatomical studies in both purpose and spirit.

Mr̥ta Saṃsodhana is not merely a physical exploration; it represents a sacred and disciplined approach toward understanding the human organism — integrating knowledge, reverence, and ethical conduct. This practice reflects *Ayurveda*'s experiential learning model, where theoretical understanding of *Sharira Rachana* (anatomy) and *Sharira Kriya* (physiology) is supplemented by direct observation. Through this process, students could visualize *Srotas*, *Snayu*, *Sira*, *Marma* and other vital structures, thereby enhancing clinical and surgical competence.

In the present era, as cadaveric dissection continues to be the gold standard for anatomical education, revisiting the *Ayurvedic* concept of *Mr̥ta Saṃsodhana* offers valuable insight into the origins of anatomical science in India. This review explores its historical background, methodology, ethical aspects, and educational relevance.

AIMS AND OBJECTIVES

□ To explore the classical *Ayurvedic* concept of *Mr̥ta Saṃsodhana* as described by *Acharya Sushruta* in the *Sushruta Saṃhita*.

- To analyze the methodology of cadaveric preparation, preservation, and dissection (*Shava Sodhana, Shava Samrakṣaṇa, and Shava Chedana*) in the *Ayurvedic* context.
- To compare the ancient *Ayurvedic* techniques of cadaveric study with modern anatomical dissection and preservation methods.
- To highlight the ethical, educational, and philosophical significance of *Mṛta Saṃsodhana* in the development of anatomical knowledge.

MATERIAL AND METHODS

- This study is based on literary review of *Ayurvedic* texts.
- Primary sources include *Sushruta Saṃhita, Charaka Saṃhita* and Secondary sources include commentaries like *Ghanekar* and Tara Chand Sharma.
- Information was collected about cadaver selection, preservation, and dissection methods mentioned in *Ayurveda*.
- The collected data was analyzed and compared with modern anatomical methods.
- The study focuses on understanding the procedure, purpose, and importance of *Mṛta Saṃsodhana* in anatomical education.

LITERARY REVIEW

1. Importance of *Mṛta Saṃsodhana* (Significance of Cadaveric Study)

The enumeration and understanding of the human body's organs (*Anga-Pratyanga Gaṇana*) must be based on valid means of knowledge (*Pramāṇa*), among which *Pratyakṣa pramaṇa* — direct observation — holds the highest value. According to *Sushruta Saṃhita Sharirasthana*, the method of *Mṛta Saṃsodhana* enables experiential learning through direct observation of body structures, thus forming the foundation for authentic anatomical knowledge.

Acharya Charaka also acknowledged the significance of *Sharira-Vichaya* (study of bodily components) for effective medical practice, emphasizing that understanding the body's structure aids in maintaining and restoring health. However, he focused more on the philosophical and physiological aspects rather than detailed dissection methods, which were elaborated primarily by *Acharya Sushruta*.^[1]

Ayurvedic anatomy thereby integrates both *Pratyakṣa Gyaana* (direct perception) for visible structures and *Anumana* or *Aptopadeśa* (inference and scriptural authority) for subtle components.^[2] Thus, *Mṛta Saṃsodhana* stands as the fundamental tool for gaining precise

and experiential anatomical knowledge, bridging the theoretical and practical dimensions of *Sharira*.

2. *Mṛta Saṃsodhana Sharira* (Practical Anatomy)

The exploration of the body's structure (*Sharira*) has been central to *Ayurvedic* education since antiquity. Among various learning methods — *Sthanantara* (systemic), *Pradesika* (regional), *Tulanatmaka* (comparative), and *Vyavaharika* (applied anatomy) — *Shava Chedana* (cadaveric dissection) holds primary importance for practical understanding.

Like modern anatomy, *Ayurveda* also upholds that theoretical knowledge must be complemented by direct examination of the *Mṛta Deha* (cadaver). The classical process of *Mṛta Saṃsodhana* includes detailed procedures for *Shava Saṃrakṣaṇa* (preservation) and *Abhiranjana* (softening of tissues) to enable systematic study. These methods demonstrate a sophisticated understanding of practical anatomy and reflect the scientific temperament of ancient India.

Though the term *Sharira* generally refers to the living body, in this context, it is used for the *Mṛta Deha* — highlighting *Ayurveda's* deep respect for the human body as both a vehicle of life and an instrument of learning.^[3]

3. Selection and *Shava Sodhana* (Cleansing of Cadaver)

Before proceeding to preservation, *Acharya Sushruta* emphasized the importance of proper selection and purification (*Sodhana*) of the cadaver. The process begins with choosing an appropriate body that is fit for anatomical study. According to *Sushruta Saṃhita Sharirasthana*, the selected cadaver should belong to a person whose body is intact, free from deformity, and who has not died due to poisoning (*Viṣopahata*), chronic illness (*Dirghavyadhi*), or advanced age (*Vṛddha*).^[4] Such a cadaver ensures the preservation of normal structural details essential for accurate observation.

After selection, *Shava Sodhana* (cleansing) is performed to prevent early decomposition. The intestinal contents and excreta are removed carefully to reduce internal bacterial activity. The orifices are cleaned, and the body is washed with water or herbal decoctions to maintain hygiene and purity before preservation. This preparatory stage reflects the *Ayurvedic* concern for both scientific accuracy and ritual sanctity, considering the human body a sacred medium

for anatomical education. It forms the essential foundation for the next phase—*Shava Samrakṣaṇa* (preservation).

The practice of *Shava Samrakṣaṇa* was not unique to India. Ancient civilizations such as Egypt also developed preservation methods. References from the *Ramayāna* and *Mahabharata* show awareness of preservation — for instance, *Maharṣi Vasiṣṭha*'s instruction to preserve King *Dasharatha*'s body in oil (*Taila-Drauṇi*) indicates early knowledge of delaying decomposition. Similarly, Egyptian mummification, involving medicinal and aromatic substances, demonstrates the universal quest to preserve human remains. Thus, both ancient Indian and Egyptian traditions reveal the scientific and spiritual dimensions of preserving the human body — reflecting reverence toward the physical form as a vessel of knowledge.^[5]

Acharya Sushruta, the eminent authority of *Shalyatantra*, outlined the classical methods of *Shava Shodhana* (cleansing) and *Shava Samrakṣaṇa* (preservation), which serve as exemplary models of anatomical study. He emphasized that before dissection, the cadaver must be purified, preserved, and then dissected systematically.^[6]

4. *Shava Samrakṣaṇa* (Cadaver Preservation as per *Acharya Sushruta*)

Acharya Sushruta has given a systematic and practical method for preserving the cadaver prior to dissection. The selected cadaver should belong to a person whose body has all the parts intact, who has not died due to poison, chronic illness, or extreme old age. Before preservation, the intestinal contents and excreta should be removed properly to avoid early decomposition.

The body is then wrapped with natural fibrous materials such as *Munja* (sacred grass), *Valkala* (bark), *Kusha*, or *Shaṇa* (hemp fibers) and placed inside an iron cage (*loha-Piñjara*). This cage containing the body is submerged in a **calm, slow-flowing stream or water body**, and tied securely to prevent drifting away. The submersion allows gradual softening and partial decomposition of the tissues, which helps in later dissection.

This method of *Shava Samrakṣaṇa* represents an early and effective approach to natural preservation using easily available materials and environmental conditions. The emphasis lies on maintaining the integrity of the cadaver until it is ready for anatomical study, thereby preparing it for the subsequent stage of *Mṛta sodhana* or dissection.

Ancient Method of Cadaver Preparation (*Jala-Majjana Koth Method*)

The ancient procedure of preparing a cadaver for anatomical study differs considerably from the modern method. The traditional technique, known as the *Jala-Majjana Koth Paddhati* (water immersion method), was used for softening the body prior to dissection. Although its exact purpose is difficult to determine, analysis suggests it aimed to make the body tissues soft enough to be examined by rubbing with a brush (*Kunchee*), the instrument used for dissection in ancient times.

Post-Mortem Changes

Before understanding the rationale of this method, it is essential to review the post-mortem (cadaveric) changes that occur after death

1. Cadaveric Lividity (Post-mortem discoloration): Accumulation of blood in the dependent parts of the body, causing discoloration.
2. Rigor Mortis: Stiffening of muscles a few hours after death due to biochemical changes; it lasts for 1–3 days.
3. Cooling of the Body: After death, body temperature gradually falls; when it drops to around 80°F, death can be considered confirmed.
4. Putrefaction (Decomposition): This is the most definitive sign of death. It results from the action of bacteria (both internal and external) and autolytic enzymes. Internal bacteria, mainly from the intestines, spread throughout the body after death, while external bacteria enter through skin breaches. Together, these microorganisms and enzymes break down tissues, producing gases and foul odor.

Effect of the *Jala-Majjana* (Water Immersion) Method

Based on modern understanding of putrefaction, immersion of the cadaver in water likely had several effects

The skin remained intact, minimizing entry of external bacteria.

Removal of intestinal contents reduced internal bacterial activity.

Submersion in water at a constant low temperature limited bacterial growth and slowed decay.

As a result, decomposition occurred slowly and uniformly, primarily through autolytic (self-digestive) processes rather than bacterial putrefaction. This made the body soft, facilitating gradual removal of tissues by brushing, and allowing visual study of the organs as they were exposed.^[7]

5. *Mṛta sodhana* / *Shava Chedana* (Cadaveric Dissection as per *Acharya Sushruta*)

In the *Sushruta Samhita*, *Acharya Sushruta* has described a scientific and sequential method for obtaining direct anatomical knowledge (*Pratyakṣa Gyana*) through cadaveric study. After adequate preservation, the softened cadaver is taken out of the water, and its outer coverings are carefully removed.

The dissection procedure does not involve sharp incisions but rather gradual mechanical cleaning of tissues. The softened parts are gently brushed off using brushes made from *Khus* (vetiver roots), bamboo fibers, hair, or bark strips, so that the internal structures can be sequentially visualized without damaging them.

Through this meticulous process, the student observes both external (*Bahya*) and internal (*Abhyantara*) structures — including *Mamsa* (muscles), *Sira* (veins), *Snayu* (ligaments), *Asthi* (bones), and *Srotas* (channels). This systematic exploration enables direct experiential understanding of the body's organization.

This procedure, described as the ancient Indian method of *Mṛtasodhana*, relies on natural decomposition and manual cleaning rather than cutting. It highlights not only the precision of ancient anatomical science but also its underlying values — observation, patience, discipline, and reverence for the human body as a sacred medium of learning.

6. Comparison with Modern Method^[8]

In contrast, modern embalming uses chemical preservation, chiefly formalin and arsenical compounds, injected into the cadaver to inhibit decay. The body is then stored in a cold chamber until ready for dissection. Modern dissection employs scalpels and forceps to systematically separate and study body parts—hence the term “dissection” is used.

The ancient water immersion and brush-rubbing techniques were relatively crude, which may explain discrepancies in the number and description of structures (like muscles and nerves) recorded in ancient texts compared to modern anatomy. Ancient scholars relied mainly on gross anatomical observation (*Sthoola Sharira*) through direct vision, as microscopic techniques were not yet developed. Occasionally, however, descriptions resembling microscopic anatomy (*Sukshma Sharira*) are also found, which reflect keen observation and inference.

DISCUSSION

The study of *Mṛta Saṃsodhana* reveals that ancient Indian physicians approached anatomy as both a science and a sacred discipline. Their methods were empirically grounded, emphasizing experiential observation while upholding ethical conduct toward the cadaver. The *Jala-Majjana* technique of preservation ensured natural softening of tissues, enabling careful exploration without mutilation. Compared to modern dissection, which focuses primarily on precision and visualization, the *Ayurvedic* approach integrated spiritual awareness and environmental adaptation. This ancient methodology underscores *Ayurveda*'s unique contribution to global anatomical heritage and its relevance in promoting respect, mindfulness, and sustainability in contemporary medical education.

CONCLUSION

Mṛta Saṃsodhana stands as a testament to the scientific vision of ancient India and the pedagogical depth of *Acharya Sushruta*'s teachings. It laid the foundation for practical anatomy, combining observation, discipline, and ethical values. While modern anatomy has advanced through technology, the core principle remains identical — knowledge through direct perception. Incorporating the spirit of *Mṛta Saṃsodhana* into present-day education can foster a balanced outlook that unites scientific inquiry with humanistic values.

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