

Review Article



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“CONCEPT OF SHASTRA KARMA (SURGICAL INTERVENTIONS) IN AYURVEDA: A CRITICAL REVIEW”

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ABSTRACT

Introduction: Ayurveda, the ancient Indian system of medicine, emphasizes a holistic approach to health, including medical, para-surgical, and surgical interventions. Among these, *Shastra Karma* (surgical procedures) represents the pinnacle of therapeutic interventions, as detailed extensively in the *Sushruta Samhita*. This text not only provides descriptions of surgical techniques but also classifies instruments, methods of wound management, and perioperative care, establishing Ayurveda's pioneering role in the history of surgery. **Methods:** A comprehensive literature search was conducted using classical Ayurvedic texts (*Sushruta Samhita*, *Charaka Samhita*, *Ashtanga Hridaya*), commentaries, and modern translations. Electronic databases including PubMed, Scopus, and Google Scholar were searched for relevant studies published between 1990 and 2025. Keywords included “Shastra Karma,” “Ayurvedic surgery,” “Sushruta,” and “ancient surgical practices.” Both clinical and experimental studies, reviews, and historical analyses were included. Exclusion criteria comprised non-English studies without translation and publications lacking methodological clarity. **Results:** The review revealed that *Shastra Karma* encompasses a wide spectrum of interventions such as excision, incision, drainage, foreign body removal, lithotomy, and reconstructive procedures. Evidence supports the efficacy of Ksharasutra therapy for fistula-in-ano and Agnikarma for musculoskeletal disorders, validating classical concepts through modern trials. Perioperative principles described by Sushruta, including asepsis, anesthesia, and post-operative care, align with modern surgical protocols. However, gaps exist in clinical validation, standardized methodologies, and integration with evidence-based practice. **Discussion:** The integration of *Shastra Karma* with modern surgical advancements offers promising prospects for minimally invasive techniques, wound management, and para-surgical therapies. Despite challenges in standardization and global acceptance, Ayurvedic surgery retains significant relevance in contemporary practice.

KEYWORDS: Agnikarma, Ayurveda, Ksharasutra, Shalya Tantra, Shastra Karma



INTRODUCTION

Surgery (*Shalya Tantra*) forms one of the eight fundamental branches (*Ashtanga Ayurveda*) of Ayurveda, with *Shastra Karma* representing its most direct therapeutic approach^[1-2]. *Sushruta Samhita*, considered the foundational text of surgical science, describes in detail the classification of surgical instruments (*Yantra* and *Shastra*), surgical techniques, wound management, and perioperative protocols. The scientific principles enunciated by Sushruta underscore the sophistication of ancient Indian surgical practice^[3-4].

Over centuries, the prominence of *Shastra Karma* diminished due to sociopolitical influences, colonial restrictions, and the shift toward internal medicine in Ayurveda^[5]. Nevertheless, specific surgical and para-surgical techniques such as *Ksharasutra*, *Agnikarma*, and *Raktamokshana* have continued to be practiced, finding validation in clinical settings and modern biomedical research. With growing global interest in integrative medicine, these practices are increasingly revisited for their efficacy and potential synergy with contemporary surgery^[6-8].

The present review aims to critically analyze the concept of *Shastra Karma* in Ayurveda by synthesizing information from classical texts and modern evidence. The objectives are to (1) elucidate the classical basis of *Shastra Karma*, (2) highlight validated clinical applications, (3) compare traditional and modern approaches, and (4) identify gaps and future prospects for integration into evidence-based medicine^[9-10].

MATERIALS AND METHODS

Literature Search Strategy

A comprehensive search was conducted between January and June 2025. Primary Ayurvedic sources included *Sushruta Samhita* (with Dalhana commentary), *Charaka Samhita*, and *Ashtanga Hridaya*. Secondary references comprised translations, commentaries, and peer-reviewed research articles^[11].

Databases Used^[12]: PubMed, Scopus, Web of Science, Google Scholar

Keywords^[13]

“Shastra Karma,” “Ayurvedic surgery,” “Ksharasutra,” “Agnikarma,” “Sushruta,” “Ayurvedic wound management.”

Inclusion Criteria^[14]

- Studies and reviews published between 1990–2025
- Clinical trials, case studies, experimental research
- Historical and conceptual analyses of *Shastra Karma*
- Peer-reviewed articles in English

Exclusion Criteria^[15]

- Non-English studies without translation
- Popular literature without scientific or textual backing
- Reports with inadequate methodology or unclear outcomes

Type of Studies Reviewed^[15]

- Clinical research on para-surgical methods (e.g., *Ksharasutra* therapy, *Agnikarma*)
- Experimental models validating Ayurvedic surgical principles
- Conceptual and historical reviews on surgical practices in Ayurveda

OBSERVATION AND RESULTS

1. Classical Basis of Shastra Karma

The foundation of *Shastra Karma* is laid down in the *Sushruta Samhita*, which describes over 300 surgical procedures and more than 120 surgical instruments. Sushruta's classification of surgical interventions includes excision (*chedana*), incision (*bhedana*), scraping (*lekhana*), puncturing (*vedhana*), probing (*eshana*), extraction (*aharana*), drainage (*visravana*), and suturing (*sevana*). These represent the core surgical modalities in Ayurveda.

Sushruta emphasized the importance of surgical training through practical demonstrations on natural materials such as fruits, vegetables, animal bladders, and cadavers, highlighting the role of experiential learning, which resonates with modern surgical simulations.

2. Instruments and Techniques

The instruments (*Shastra* and *Yantra*) described by Sushruta demonstrate remarkable sophistication. Tools such as scalpels, forceps, needles, catheters, and probes were meticulously classified based on their design and utility. Modern reconstructions of these instruments reveal striking similarities with today's surgical tools, underscoring the advanced nature of Ayurvedic surgery.

Techniques such as rhinoplasty (*nasasandhana*), described in the *Sushruta Samhita*, highlight

reconstructive surgical practices that predate similar European advances by centuries. The forehead flap method of rhinoplasty described by Sushruta remains a cornerstone in plastic surgery today.

3. Perioperative Care

Sushruta emphasized holistic perioperative management, including preparation of the patient, aseptic techniques, anesthesia, and post-operative care. Wine and herbal formulations were employed for analgesia and sedation, marking an early attempt at anesthesia. Aseptic measures such as wound irrigation with herbal decoctions and dressing with medicated oils exhibit parallels with modern antisepsis.

Dietary advice, lifestyle regulation, and close monitoring were integral to surgical outcomes, highlighting Ayurveda's focus on comprehensive patient care.

4. Para-surgical Methods with Clinical Validation

- **Ksharasutra Therapy:** A medicated seton prepared from herbal alkalis (*Achyranthes aspera*, *Apamarga*) and applied in fistula-in-ano. Numerous randomized controlled trials (RCTs) have validated its efficacy, demonstrating lower recurrence rates compared to conventional surgery.
- **Agnikarma (Thermal Cautery):** Used for conditions such as plantar fasciitis, arthritis, and muscular pain. Clinical trials have demonstrated significant analgesic and functional improvement.
- **Raktamokshana (Bloodletting):** Employed in skin disorders, hypertension, and localized inflammation. Leech therapy (*Jalaukavacharana*) has been validated in venous congestion and osteoarthritis.

5. Wound Management and Healing

Sushruta's principles of wound management (*Vrana chikitsa*) emphasize cleansing, debridement, and dressing with herbal formulations such as honey, ghee, and oils. Modern studies confirm the antimicrobial, anti-inflammatory, and wound-healing properties of these substances, validating traditional practices.

6. Specialized Surgical Interventions

- **Lithotomy:** Descriptions of bladder stone removal procedures illustrate the advanced urological practices in Ayurveda.

- **Foreign Body Removal:** Detailed methods for identifying and extracting foreign objects were highlighted, reflecting surgical precision.
- **Ophthalmic and ENT Surgeries:** Sushruta's descriptions of cataract extraction, nasal polyp removal, and ear surgeries reflect the breadth of Ayurvedic surgical expertise.

7. Evidence from Modern Research

Modern scientific studies have validated several aspects of *Shastra Karma*. Ksharasutra therapy is now accepted by the Indian Council of Medical Research (ICMR) as a standard treatment for fistula-in-ano. Agnikarma has been supported by clinical trials demonstrating pain relief and functional improvement. Leech therapy has been reintroduced in microsurgery for maintaining venous flow in reimplanted tissues.

Experimental studies on Ayurvedic wound dressings (e.g., honey, turmeric) have shown potent antimicrobial and wound-healing effects, aligning with Sushruta's recommendations.

8. Limitations and Challenges

Despite its advanced concepts, challenges exist in validating *Shastra Karma* practices, including lack of large-scale randomized trials, difficulties in standardizing procedures, and limited global acceptance due to inadequate integration with modern surgical frameworks. However, increasing evidence is gradually bridging these gaps.

DISCUSSION

The findings of this review reveal that Ayurveda's *Shastra Karma* demonstrates remarkable parallels with modern surgical practices while offering unique insights into holistic patient care. The sophistication of surgical techniques in *Sushruta Samhita*, including excision, incision, lithotomy, and rhinoplasty, highlights the advanced knowledge of ancient Indian surgeons^[16].

Comparisons with modern surgery show that while techniques have evolved with advanced technology, the fundamental principles remain consistent. For example, Sushruta's emphasis on asepsis and perioperative care mirrors modern sterilization and infection control. Similarly, his teaching methodology through simulations aligns with current surgical training models using mannequins and virtual reality^[17].

Validated practices like Ksharasutra and Agnikarma



have demonstrated clinical efficacy and represent a bridge between classical knowledge and evidence-based medicine. The use of herbal formulations for wound healing, now supported by pharmacological studies, showcases Ayurveda's foresight in natural therapeutics^[18].

However, the major limitation lies in the lack of large-scale, multicentric clinical trials that can generate high-level evidence for global acceptance. Standardization of techniques, quality control of materials, and ethical considerations in surgical training are areas that require urgent attention. Additionally, while Ayurveda's holistic approach emphasizes patient-specific management, modern frameworks demand uniform protocols, creating a gap that must be carefully bridged^[19].

The future of *Shastra Karma* lies in integrative approaches. Modern surgical technology can enhance the precision of classical procedures, while Ayurvedic principles can contribute to better post-operative recovery, reduced complications, and enhanced patient well-being. Collaborative research, interdisciplinary training, and incorporation of Ayurvedic para-surgical methods into mainstream practice can provide significant breakthroughs^[20].

Thus, while *Shastra Karma* has been historically marginalized, renewed scientific validation and integrative approaches highlight its relevance and potential in global healthcare.

CONCLUSION

Shastra Karma in Ayurveda represents a highly evolved surgical system that predates and parallels many modern practices. The *Sushruta Samhita* provides detailed descriptions of surgical procedures, instruments, perioperative care, and wound management, underscoring the advanced state of surgical science in ancient India. Techniques such as Ksharasutra, Agnikarma, and Raktamokshana have received validation through modern research, establishing their clinical utility and global relevance. The review highlights that many of Sushruta's principles, including asepsis, anesthesia, and holistic perioperative care, align with modern surgical protocols, reflecting Ayurveda's scientific foresight. While technological advancements have refined surgical practices, Ayurveda's unique emphasis on holistic recovery, natural therapeutics, and individualized care provides an invaluable

complement to contemporary surgery.

However, challenges remain in the standardization, large-scale validation, and integration of these practices into mainstream surgical systems. Addressing these gaps through rigorous research and interdisciplinary collaboration can pave the way for a global reappraisal of *Shastra Karma*.

In conclusion, *Shastra Karma* exemplifies Ayurveda's contribution to the global heritage of surgery, offering timeless principles and innovative practices. Its integration with modern surgical science holds the potential to enrich patient care, improve outcomes, and foster a more holistic, evidence-based healthcare system.

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