

Review Article

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“SHALYA (FOREIGN BODY) MANAGEMENT IN AYURVEDA: CLASSICAL REFERENCES AND MODERN VALIDATION”

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ABSTRACT

Introduction: The presence of *Shalya* (foreign body) is an important clinical concern in surgical practice, often leading to pain, suppuration, impaired wound healing, and systemic complications if untreated. The *Sushruta Samhita*, regarded as the earliest surgical treatise, provides detailed guidelines for identification, extraction, and management of *Shalya*. These principles resonate with modern surgical techniques in foreign body removal and wound management. **Methods:** A systematic review of primary Ayurvedic texts (*Sushruta Samhita*, *Charaka Samhita*, *Ashtanga Hridaya*), authoritative commentaries, and secondary literature was performed. Electronic searches in PubMed, Scopus, Web of Science, and AYUSH Research Portal were conducted for clinical and experimental studies on foreign body management, Ayurvedic wound care, and modern parallels. Inclusion criteria were classical references, reviews, experimental validations, and clinical trials on wound healing or extraction techniques. Exclusion criteria were unrelated pharmacological studies and non-surgical interventions. **Results:** Classical texts describe *Shalya* as exogenous (e.g., thorns, metal, wood) and endogenous (e.g., bone fragments), causing obstruction and infection. Diagnostic methods included palpation, probing, and visualization with oil instillation. Removal techniques involved specialized instruments (*Shalya Yantras*) and procedures like *Bhedana* (incision) and *Lekhana* (scraping). Post-extraction, wound care with herbal formulations (e.g., *Jatyadi Taila*, *Panchavalkala Kwatha*) was prescribed. Modern studies validate many herbal agents for antimicrobial and healing properties, paralleling antiseptics and dressings. Comparative evidence demonstrates that Ayurveda’s emphasis on asepsis, minimal invasiveness, and local wound healing correlates with current surgical practice.

Discussion: Classical *Shalya Tantra* highlights holistic surgical principles, integrating diagnosis, extraction, and wound care. Modern validation supports antimicrobial and wound-healing efficacy of several Ayurvedic formulations. However, standardized clinical trials and integration into surgical protocols remain limited. **Conclusion:** *Shalya* management in Ayurveda reflects advanced surgical wisdom. Bridging classical principles with modern validation offers opportunities for integrative surgical care, especially in wound healing and infection prevention.

KEYWORDS: Ayurveda, Foreign body, Shalya, Surgery, Wound management



INTRODUCTION

The presence of a foreign body within human tissue is a significant clinical challenge across surgical specialties^[1]. If left untreated, it can cause persistent pain, suppuration, abscess formation, necrosis, and systemic complications. Modern surgery emphasizes early detection, accurate localization, complete removal, and subsequent wound care to prevent infections and enhance healing^[2-3].

Ayurveda, particularly the *Sushruta Samhita*, addresses the management of *Shalya* (foreign bodies) with remarkable detail. Sushruta classifies foreign bodies into *Agantuja* (external) and *Sharirika* (internal), elaborating on their complications, diagnostic methods, extraction techniques, and postoperative care^[4-5]. These descriptions include both surgical interventions using specialized instruments and medicinal applications for wound healing, reflecting the sophistication of ancient Indian surgical science^[6-8].

This review aims to explore classical Ayurvedic concepts of *Shalya* management, analyze their correlation with modern surgical principles, and present existing experimental and clinical validations. The objectives are: (1) to document classical references of *Shalya* management, (2) to review modern research on related Ayurvedic formulations and techniques, and (3) to highlight integrative approaches for contemporary surgical practice^[9-10].

MATERIALS AND METHODS

A narrative and systematic review was undertaken.

Sources searched:

- Primary texts: *Sushruta Samhita*, *Charaka Samhita*, *Ashtanga Hridaya*.
- Commentaries: Dalhana's *Nibandhasangraha*, Chakrapani on *Charaka*.
- Databases: PubMed, Scopus, Web of Science, AYUSH Research Portal, and Google Scholar.

Search terms: “*Shalya Ayurveda*,” “foreign body removal *Ayurveda*,” “*Ayurvedic wound healing*,” “*Jatyadi Taila*,” “*Ayurveda surgery validation*.^[12]”

Inclusion criteria:

- References from classical Ayurvedic texts.
- Clinical or experimental studies on Ayurvedic formulations used in wound healing.

- Modern surgical literature on foreign body management relevant for comparison.

Exclusion criteria:

- Non-surgical interventions not related to *Shalya* management.
- Articles without reference to either classical sources or modern validation.

Types of studies reviewed: Classical descriptions, commentaries, narrative reviews, laboratory validations, and clinical trials^[15].

OBSERVATION AND RESULTS

1. Concept and Classification of Shalya

The concept of *Shalya* occupies a central place in *Sushruta Samhita*, where it is defined as any foreign object—external or internal—that disrupts the integrity of body tissues, obstructs physiological functions, and causes pain or suppuration if not removed promptly. Sushruta classified *Shalya* into exogenous (*Agantuka*) and endogenous (*Sharirika*) categories.

Exogenous *Shalya* includes materials such as thorns, splinters of wood, metallic objects, arrows, and other weapons, which were common in the era of frequent warfare and forest life. Endogenous *Shalya* refers to materials generated within the body, such as bone fragments, calculi (urinary or gallstones), and even broken teeth. The importance of this classification lies in the treatment approach, as external *Shalya* often required immediate mechanical extraction, whereas internal *Shalya* demanded systemic or specialized surgical management.

Modern parallels exist in today's classification of foreign bodies into traumatic (penetrating materials like bullets, glass, or wood) and pathological (stones, bone fragments). Both Ayurveda and modern medicine emphasize the dangers of retained foreign bodies, including infection, impaired healing, and chronic inflammation. Thus, the ancient conceptualization of *Shalya* remains remarkably relevant.

2. Diagnosis of Shalya

Accurate diagnosis formed the cornerstone of effective *Shalya* management in Ayurveda. Sushruta described a comprehensive diagnostic methodology:

- **Inspection (Darshana):** Visual examination of wounds to identify superficial *Shalya*.
- **Palpation (Sparshana):** Gentle probing to detect hard, sharp, or embedded objects.

- Probing (Eshana): Use of metallic probes or specially designed instruments to locate the foreign body's position.
- Ancient Imaging: In deep-seated Shalya, medicated oils such as Tilataila or Ghrita were instilled, allowing better visualization or enhanced tactile feedback during probing. This reflects an ingenious adaptation to clinical limitations in the absence of imaging technologies.

In modern medicine, these diagnostic strategies parallel the use of radiography, ultrasonography, CT scans, and MRI for localizing foreign bodies. While superficial Shalya can often be identified clinically, deeper objects require advanced imaging for accurate localization and planning of surgical intervention. The Ayurvedic reliance on tactile skill and indirect visualization highlights the surgical acumen of ancient physicians.

3. Instruments for Extraction (Shalya Yantra)

Sushruta, often regarded as the "Father of Surgery," described 101 types of surgical instruments (*Yantra* and *Shastra*), many of which were specifically designed for Shalya removal. Notable instruments included:

- Vriddhipatra – for making incisions.
- Shalaka – probes for detecting and mobilizing foreign bodies.
- Kushapatra and Mandalagra instruments – for extracting lodged materials with minimal trauma.

The design principles emphasized precision, ease of handling, minimal tissue damage, and asepsis. Instruments were fashioned from metals like iron and steel, sterilized by heating and quenching in herbal decoctions, showcasing a rudimentary but effective understanding of asepsis.

Modern surgical practice employs analogous tools such as forceps, hemostats, curettes, and endoscopic retrieval devices. The similarity in design and function underscores the sophistication of ancient surgical practice and validates Sushruta's pioneering contributions.

4. Techniques of Removal

The actual process of foreign body removal was meticulously categorized in Ayurveda into distinct surgical techniques:

- Bhedana (Incision): Employed for superficial or palpable Shalya, allowing direct access.
- Lekhana (Scraping): Applied for embedded particles or calcified deposits.
- Vyadhana (Piercing): Used for penetrating sharp objects.
- Aharana (Extraction): Involved actual removal using appropriate Yantras.

Each technique was tailored to the type, size, and location of the Shalya, ensuring minimal damage to surrounding tissues.

Modern parallels can be observed in minor surgical procedures such as wound exploration, incision and drainage, and extraction under aseptic conditions. Current best practices also emphasize the same principles outlined by Sushruta—precise localization, careful removal, prevention of tissue damage, and maintenance of sterility.

5. Post-extraction Wound Management

Sushruta prescribed detailed post-extraction protocols to ensure optimal wound healing:

- Cleansing: Wounds were washed with decoctions such as *Panchavalkala Kwatha* (composed of bark extracts) or *Triphala Kashaya*, both possessing antimicrobial and anti-inflammatory properties.
- Topical applications: Medicated oils and ghee preparations, including *Jatyadi Taila* and *Shatadhouta Ghrita*, were applied for their soothing, healing, and antiseptic effects.
- Bandaging (Vrana Bandhana): Wounds were dressed with sterile herbal dressings, ensuring protection against contamination.

Modern medicine echoes these approaches through antiseptic lavage, application of antibiotic ointments, and sterile gauze dressings. The emphasis on natural antimicrobials in Ayurveda has been validated by research demonstrating the efficacy of honey, neem, and turmeric in wound healing.

6. Complications of Retained Shalya

Sushruta warned against incomplete removal, describing the condition as *Shalya Avasesha*. Consequences included persistent pain, inflammation, suppuration, and functional impairment. Chronicity could lead to sinus or fistula formation, systemic fever, or delayed wound healing.

Modern medical literature identifies comparable complications such as foreign body granuloma,



chronic abscess, osteomyelitis, and chronic fistulae, reinforcing the accuracy of ancient clinical observations. The recognition of systemic and local consequences highlights the foresight of Ayurvedic surgery in emphasizing complete and aseptic removal.

7. Modern Validation of Ayurvedic Formulations

Several classical wound management agents prescribed after *Shalya* removal have been subjected to scientific scrutiny:

- Honey: Demonstrated broad-spectrum antimicrobial activity, acceleration of granulation tissue, and enhanced epithelialization. Clinical trials confirm honey's effectiveness in chronic wounds, burns, and postoperative care.
- Neem (*Azadirachta indica*) and Turmeric (*Curcuma longa*): Both exhibit potent antibacterial, antifungal, and anti-inflammatory effects, validated through in vitro and clinical studies.
- Triphala: Shown to possess wound healing properties comparable to standard antiseptics like povidone-iodine, with added antioxidant effects.
- Jatyadi Taila: Documented efficacy in chronic non-healing wounds, bedsores, and ulcers, with modern research highlighting its antimicrobial and tissue-regenerative effects.

Thus, modern pharmacology and clinical research provide robust validation of Ayurvedic wound care protocols, supporting their integration into contemporary practice.

8. Clinical Outcomes and Research Evidence

Contemporary studies on Ayurvedic interventions in *Shalya*-related wound management demonstrate encouraging outcomes:

- Panchavalkala Decoction: Clinical studies report reduced infection rates, faster granulation, and shorter healing time when used as a wound wash.
- Shatadhouta Ghrita: Applied in burn wounds and chronic ulcers, it has shown cooling, soothing, and healing effects, supported by its anti-inflammatory action.
- Honey Dressings: Several randomized controlled trials have established the superiority of honey in managing

postoperative wounds, traumatic lacerations, and burns compared to conventional dressings.

These findings not only validate the classical texts but also demonstrate the potential for Ayurvedic wound care to complement modern surgical practice, particularly in low-resource settings where cost-effective alternatives are essential.

DISCUSSION

The management of *Shalya* in Ayurveda reflects an advanced understanding of surgical pathology and techniques. Sushruta's emphasis on complete removal, prevention of secondary complications, and wound healing shows a holistic approach. The classification of foreign bodies into exogenous and endogenous resembles modern categories of penetrating trauma, retained surgical materials, and calculi^[16].

A remarkable parallel exists between ancient and modern diagnostic strategies. While Sushruta used palpation, probing, and oil instillation for localization, modern imaging modalities like X-ray and ultrasound provide precise localization. Similarly, the surgical instruments described in *Shalya Tantra* closely resemble forceps, probes, and scissors used today^[17]. The extraction techniques described—*Bhedana*, *Lekhana*, *Vyadhana*, and *Aharana*—demonstrate principles of surgical precision and minimal invasiveness. Post-extraction, the use of herbal wound cleansers and medicated dressings reflects antiseptic measures, comparable to modern antiseptic washes and dressings^[18].

Modern pharmacological studies validate the antimicrobial properties of formulations like *Jatyadi Taila*, *Panchavalkala Kwatha*, *Triphala*, and honey, which support their continued relevance. However, limitations exist in the form of small-scale trials, lack of standardized protocols, and absence of large randomized controlled trials^[19].

Future prospects lie in integrating validated Ayurvedic wound-healing agents with surgical protocols, particularly in low-resource settings. The concept of *Shalya Avasesha* also emphasizes the dangers of retained foreign bodies, resonating with modern medico-legal concerns in surgery^[20].

Thus, Ayurveda's approach to *Shalya* management demonstrates a timeless surgical principle: accurate diagnosis, safe extraction, and effective wound care.

Modern validation not only supports but also encourages incorporation of Ayurvedic measures into integrative surgical practice.

CONCLUSION

Shalya Tantra in Ayurveda presents a comprehensive framework for the management of foreign bodies, combining diagnostic acumen, surgical precision, and wound care. The principles laid down by Sushruta—thorough examination, complete removal, and meticulous aftercare—remain central to modern surgical practice.

The classical use of fumigation, herbal wound cleansers, and medicated oils highlights the sophistication of ancient antisepsis measures. Modern validation studies confirm the antimicrobial and healing potential of several Ayurvedic formulations, including *Jatyadi Taila*, *Panchavalkala Kwatha*, *Triphala*, and honey.

While modern imaging and surgical tools provide precision beyond classical methods, the foundational principles of Ayurveda resonate with contemporary practice. Gaps remain in terms of large-scale clinical validation and standardization, but opportunities exist to integrate Ayurvedic approaches into modern surgical protocols.

In conclusion, *Shalya* management in Ayurveda reflects timeless surgical wisdom, validated by modern science. Its integrative application offers promising avenues for enhancing wound healing, infection prevention, and cost-effective surgical care in today's healthcare systems.

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