

Review Article

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“MUTRASHMARI (UROLITHIASIS): SUSHRUTA’S LEGACY AND THE EVIDENCE FOR PASHANABHEDA, VARUNA, GOKSHURA AND RELATED HERBS”

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ABSTRACT

Background: Urinary stone disease is common worldwide and in India, with high recurrence. Ayurveda describes Ashmari (urinary stones) as one of the eight difficult diseases, and Sushruta described both medical treatment and a perineal operation for bladder stones. Herbs such as Pashanabheda (*Bergenia ligulata*), Varuna (*Crataeva nurvala*) and Gokshura (*Tribulus terrestris*) are widely used, often in proprietary polyherbal products. **Objective:** To review the classical understanding and management of Ashmari, modern evidence-based management of urolithiasis, and the experimental and clinical evidence for Ayurvedic antiurolithic herbs. **Methods:** Narrative review of Sushruta Samhita, urological guidelines, systematic reviews, clinical trials and experimental studies. **Results:** Sushruta classified Ashmari into four types and described medical management, alkaline preparations and a perineal lithotomy, one of the earliest recorded stone operations. Modern management includes analgesia, medical expulsive therapy for some ureteric stones, shock-wave lithotripsy and endoscopic surgery, together with fluid intake and dietary measures for prevention. *Bergenia ligulata* showed antiurolithic effects in vitro and in animals through inhibition of crystal formation, diuresis and antispasmodic actions. Varuna has experimental antiurolithic effects. A systematic review of clinical studies of medicinal plants found the evidence promising but insufficient. A one-year study of a popular polyherbal product found no change in urine chemistry or stone burden. **Conclusion:** Ayurvedic herbs may have diuretic and crystal-inhibiting effects useful for small stones and prevention, but clinical evidence is limited and inconsistent. They should complement, not replace, imaging-guided urological management, particularly for obstructing or infected stones. **KEYWORDS:** Mutrashmari; Ashmari; urolithiasis; kidney stones; Pashanabheda; *Bergenia ligulata*; Varuna; Gokshura; Sushruta

INTRODUCTION

Urolithiasis affects a large proportion of people during their lifetime, with prevalence rising in many countries^[1,2]. Prevalence varies by region, and parts of north-western India are known as a “stone belt” with a particularly high burden^[3]. Stones cause severe pain (renal colic), urinary obstruction, infection and kidney damage. Recurrence is common: many patients form another stone within five to ten years without preventive measures^[1].

Modern management depends on stone size, location, composition and the presence of obstruction or infection. Options include observation and analgesia, medical expulsive therapy, extracorporeal shock-wave lithotripsy, ureteroscopy and percutaneous nephrolithotomy^[4,5]. Prevention relies on high fluid intake, dietary changes and, in some patients, medications such as thiazides or citrate^[6,7].

Ayurveda has a long tradition of treating urinary stones. Sushruta described Ashmari in detail, classified it, prescribed herbal and alkaline treatments, and, when these failed, described a surgical operation to remove bladder stones through the perineum^[8]. This operation is one of the earliest recorded descriptions of lithotomy^[9]. Today, many Ayurvedic herbs and proprietary formulations are used for stones in India. This review summarises the classical approach, modern management and the evidence for Ayurvedic antiurolithic herbs.

METHODS

Classical sources were Sushruta Samhita, Nidana Sthana 3 and Chikitsa Sthana 7^[8]. Modern literature was identified through PubMed and Google Scholar using urolithiasis, kidney stones, *Bergenia ligulata*, *Pashanabheda*, *Crataeva nurvala*, *Varuna*, *Tribulus terrestris*, *Gokshura*, *Cystone*, antiurolithic and clinical trial. This is a narrative review.

CLASSICAL UNDERSTANDING OF ASHMARI

Classification and causes

Sushruta classifies Ashmari into four types: Shleshmaja (Kapha), Pittaja, Vataja and Shukraja (related to semen)^[8]. He describes their features, including the size, colour and surface of the stone and the type of pain. He attributes stone formation to improper diet and lifestyle, suppression of urges and lack of purification, leading to Kapha accumulating

in the bladder and being dried by Vata and Pitta into a stone. He also describes Sharkara (gravel) and Sikata (sand) as smaller forms.

Clinical features

Classical features include pain in the umbilical, bladder and perineal regions, obstruction of the urinary stream, splitting of the stream, blood in urine and painful urination. These correspond to the symptoms of bladder and ureteric stones.

Medical management

Sushruta prescribes medicated ghee, decoctions, milk preparations and alkaline (Kshara) preparations made from herbs such as *Pashanabheda*, *Varuna*, *Gokshura*, *Kulaththa* (horse gram) and others for early stones^[8]. He states that early stones can be dissolved or expelled with these measures.

Surgical management

When medical treatment fails, Sushruta describes a perineal lithotomy: the patient is positioned, the stone is pushed down from above by the surgeon's fingers in the rectum, an incision is made to the side of the perineal raphe, and the stone is removed with a hooked instrument^[8]. He gives detailed instructions on avoiding injury to vital structures and on post-operative care, and warns about complications. This procedure resembles the lateral perineal lithotomy practised in Europe many centuries later^[9].

MODERN MANAGEMENT

Acute stones

Small ureteric stones often pass spontaneously. Medical expulsive therapy with alpha-blockers has been widely used; however, a large randomised trial found that tamsulosin or nifedipine did not increase spontaneous passage of ureteric stones overall compared with placebo^[5], although subsequent analyses suggest benefit for larger distal stones. Larger or obstructing stones require shock-wave lithotripsy, ureteroscopy or percutaneous nephrolithotomy^[4]. Stones with infection and obstruction are an emergency requiring drainage.

Prevention

High fluid intake to produce at least two to two and a half litres of urine per day is the cornerstone of prevention. In a five-year randomised trial, increased water intake halved the recurrence of calcium stones^[6]. Dietary measures include reducing salt and animal protein, maintaining normal calcium intake and limiting oxalate-rich foods in calcium oxalate

stone formers. Thiazides, citrate and allopurinol reduce recurrence in selected patients^[7].

AYURVEDIC ANTIUROLITHIC HERBS: EXPERIMENTAL EVIDENCE

Pashanabheda (*Bergenia ligulata*)

The name Pashanabheda means “stone breaker”. In an experimental study, a crude extract of *Bergenia ligulata* rhizome inhibited calcium oxalate crystal formation in vitro, and in rats it prevented calcium oxalate deposition in a model of hyperoxaluria-induced urolithiasis^[10]. It also showed diuretic, antispasmodic (relaxant on smooth muscle) and antioxidant effects, suggesting multiple mechanisms: preventing crystal formation, increasing urine flow and easing stone passage.

Varuna (*Crataeva nurvala*)

Varuna bark is a classical antiurolithic herb. Experimental studies in rats have reported that Varuna extract and its constituent lupeol reduce urinary oxalate and stone-forming factors and protect against crystal deposition^[11]. Varuna is also traditionally used for urinary retention and prostate enlargement.

Gokshura (*Tribulus terrestris*)

Gokshura is a classical diuretic (Mutrala) herb used in many urinary formulations, such as Gokshuradi Guggulu. Experimental studies suggest diuretic and crystal-inhibiting effects, though fewer studies are

available than for *Bergenia*.

Kulattha (*Macrotyloma uniflorum*)

Horse gram is traditionally used as a food and medicine for stones. Experimental studies suggest that it may inhibit calcium oxalate crystallisation.

CLINICAL EVIDENCE

Systematic review

A systematic review of clinical studies of medicinal plants for urolithiasis included 15 studies^[12]. Most reported diuretic effects that might help small stones pass. Among them, a placebo-controlled trial of a preparation containing *Crataeva nurvala* and *Musa paradisiaca* reported stone size reduction. However, the authors concluded that evidence was insufficient, although promising, because many studies did not identify stone type, used inconsistent preparations and outcomes, and did not explain mechanisms^[12].

Polyherbal formulations

Proprietary polyherbal formulations containing Pashanabheda, Gokshura, Varuna and other herbs are widely used in India. In a one-year study at a major academic centre in the United States, patients with recurrent stones took a widely used polyherbal formulation; it did not change urine chemistry or reduce stone burden measured by CT compared with baseline^[13]. This sobering finding underlines the need for well-designed trials before strong claims are made.

Table 1: Summary of evidence for Ayurvedic antiurolithic herbs and products

Herb or product	Evidence	Main finding	Certainty (authors' judgement)
<i>Bergenia ligulata</i>	In vitro and rat studies ^[10]	Crystal inhibition, diuresis, antispasmodic	Low (clinical)
<i>Crataeva nurvala</i>	Rat studies ^[11] ; part of a placebo-controlled combination trial ^[12]	Reduced oxalate; stone size reduction in combination	Low
<i>Tribulus terrestris</i>	Experimental	Diuretic, crystal inhibition	Very low
Plant therapies overall	Systematic review of 15 clinical studies ^[12]	Promising but insufficient	Low
Polyherbal product	One-year study in recurrent stone formers ^[13]	No change in urine chemistry or stone burden	Low (negative)

KSHARA THERAPY AND URINARY ALKALINISATION

One of the most interesting classical treatments for Ashmari is the use of Kshara, alkaline preparations made from the ashes of plants such as Pashanabheda, Varuna, Apamarga and Yava

(barley), given orally in small doses^[8]. Sushruta claims that these preparations break or dissolve stones.

Modern medicine also uses alkalinising therapy for some stones. Potassium citrate raises urinary pH and citrate, which inhibits calcium stone formation and

can dissolve uric acid stones. A Cochrane review found that citrate salts reduced the growth of new and existing calcium stones and reduced the need for further treatment compared with control^[14]. Uric acid stones in particular can be dissolved by sustained urinary alkalinisation.

This parallel suggests a testable hypothesis: that classical Kshara preparations, which are rich in potassium salts, may act partly by alkalinising the urine and increasing citrate excretion. Studies measuring urinary pH, citrate and stone growth during Kshara therapy would help determine whether classical Kshara could have a defined role, for example in uric acid or mixed stones. Such preparations should be standardised for their mineral content and used with caution in patients with kidney impairment, in whom potassium accumulation can be dangerous.

DIET IN AYURVEDA AND MODERN STONE PREVENTION

Ayurvedic advice for stone patients includes drinking plenty of water, taking Kulattha (horse gram) soup and barley water, and avoiding heavy, oily and excessively salty foods, dried foods and suppression of urges. Several of these recommendations agree with modern advice. However, modern advice is tailored to stone type: for example, calcium oxalate stone formers should maintain normal dietary calcium rather than restrict it, and limit high-oxalate foods; uric acid stone formers should reduce purine-rich foods. Because classical texts could not determine stone composition, Ayurvedic dietary advice should be combined with stone analysis and 24-hour urine testing where available.

INTEGRATING AYURVEDA IN STONE MANAGEMENT

A responsible integrated approach includes:

1. **Imaging and assessment:** ultrasound or CT to determine stone size, location, number and obstruction; urine tests for infection; renal function.
2. **Urgent referral:** fever with obstruction, solitary kidney with obstruction, severe pain not controlled by analgesics, or declining kidney function.
3. **Small stones without complications:** analgesia, high fluid intake, and Ayurvedic

diuretic and antispasmodic herbs such as Pashanabheda and Gokshura, with imaging follow-up within a defined time frame.

4. **Larger stones:** urological procedures; Ayurvedic support afterwards for prevention.
5. **Prevention:** fluid intake, diet based on stone analysis, and possibly Ayurvedic herbs, with periodic urine and imaging review.

Ayurvedic dietary principles that favour lighter foods, horse gram and avoidance of excessive salty and heavy foods are broadly consistent with modern prevention advice. However, specific advice should be based on stone composition, which classical texts could not determine.

SAFETY

Most antiurolithic herbs are well tolerated. Diuretic herbs may cause dehydration if fluid intake is not maintained. Some formulations may interact with diuretics and antihypertensive medicines. Delayed treatment of an obstructing or infected stone can cause permanent kidney damage or sepsis, so patients should be told clearly when to seek urgent care.

DISCUSSION

Sushruta's treatment of Ashmari, from medical dissolution to perineal lithotomy, is one of the most remarkable chapters in the history of surgery. His classification of stones and description of symptoms remain clinically recognisable, and his surgical approach anticipated later European techniques.

The modern evidence for Ayurvedic herbs is mixed. Experimental studies, particularly of *Bergenia ligulata*, support plausible mechanisms. Clinical studies of plant therapies are few, heterogeneous and generally of low quality, and a one-year study of a popular polyherbal product was negative. These findings argue for caution and for well-designed trials.

Future trials should enrol patients with defined stone types and sizes, measure stone passage or growth with CT, assess urinary risk factors, follow patients for at least one year, and compare herbs with placebo or standard preventive measures.

CONCLUSION

Ayurveda's approach to Mutrashmari, rooted in Sushruta's detailed classification and medical and surgical management, remains historically and clinically significant. Herbs such as Pashanabheda, Varuna and Gokshura have plausible antiurolithic

mechanisms in experimental studies, but clinical evidence is limited and inconsistent. They may support prevention and passage of small stones alongside standard urological care, but rigorous clinical trials are needed.

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