

An Ayurvedic Approach in the Management of *Ashmari* (Urolithiasis)

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Abstract: In ancient centuries urolithiasis was often a disease, with a catastrophic outcome all too often leading to the patient's death. Even today, urolithiasis is the one of the most common affliction of the urinary tract. Detailed medical literature on urolithiasis is available from ancient India. As per classics, *Ashmari* is included in *Ashtamahagada* due to its fatal nature. Description of *Ashmari* is found in almost all *Samhita* of Ayurveda as etiopathogenesis, classification, symptomatology, complications and management in a most scientific manner. Modern science also emphasizes on involvement of various factors like heredity, age, sex, metabolic disorders, hydration status, mineral content of water, nutritional deficiency, etc. For urinary stone formation. Urolithiasis typically occurs in middle age which is the most productive years of life. It causes pain, loss of working time, medical expenses, needs for hospitalization as well as it is infrequent cause of renal failure and death. Different management of urolithiasis has been developed in modern system but in spite of all these techniques, surgery remain treatment of choice. Even after surgery patients have to take medicines to check its further recurrence. In this way the need of medicinal treatment is always required.

Keywords: *Ashmari*, Urolithiasis, *Ashtamahagada*.

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1. Introduction

Ashmari is known to mankind since times immemorial and it is one of the most common and distressing disease among the group of urinary disorder. *Susruta*, the pioneer in the art of surgery, during early civilization has described the problem of *Ashmari* widely and comprehensively. The concept of *Ashmari*, its classification, symptomatology, etiological factors, pathology, complications and management have been dealt with both medico-surgical procedures.[1] *Ashmari* comprises of two words “*Ashma*” and “*Ari*”. *Ashma* means “a stone or gravel” and *Ari* means “an enemy”. *Ashmari* is a disease in which there is formation of

stone, exerting severe pain as given by enemy. *Ashmari* is considered as one of the *Ashtamahagada* (i.e. one of the deadly diseases) by *Susruta* owing to its potentiality to disturb the urinary system. [2]

In Ayurvedic literature all sorts of methodologies including surgical techniques have been described. *Acharya Susruta* said that before going for surgical procedures one should try with oral medications like *Ghruta* (Medicated ghee), *Taila* (Medicated oil), *Paneeya Kshara* (Medicated Alkali preparation), etc. [3] which possesses the properties such as *Chedana* (Cutting/ Breaking), *Bhedana* (Splitting), *Lekhana* (Scarification) and *Mutrala* (Diuretic) for facilitating the disintegration of the Urinary stones.

The symptoms of *Ashmari* like excruciating pain over *Nabhi*, *Basti*. At *Sevani*. Or at *Medhra* during micturition, sudden stoppage of urine flow, blood stained urine, twisting and slitting of urine, aggravation of pain during running, jolting etc. [4] go on in accordance with symptoms of urolithiasis of modern science. Hence urolithiasis can be co-related with the *Ashmari* mentioned in Ayurveda.

Urolithiasis is a multi-factorial disorder resulting from the combined influence of epidemiological, biochemical and genetic risk factors. The effect of geography on the incidence of stone formation may be through its effect on temperature as high temperature increases perspiration which by increasing the concentration of urine promotes increased urinary crystallization. The overall probability of forming stones differ in various parts of the world and is estimated about 1-5% in Asia, 5-9% in Europe, 13% in North America and the recurrence rate of renal stones about 75% in 20 years span. [7] The disease affects all age groups but typically occurs in middle life during the most productive years (30-50 years) with male to female ratio 4:3. [6] The recurrent nature of stone disease is a well-recognized clinical problem. Urinary metabolic abnormalities such as low urine volume, hypercalciuria, hyperoxaluria, hyperuricosuria and hypocitraturia predispose a patient to early recurrence. Male gender, multiple stones, stone location, residual fragments and some anatomic or functional urinary tract abnormalities are known to be major risk factors for recurrence. Primary stone formation and recurrence of stone formation is one of the biggest challenges faced by urologists today and remain a major source of morbidity in humans. Despite intensive studies in the last decade about many aspects of urolithiasis, the complete pathogenesis and thus prevention, still remains to be clarified. [7] In modern sciences, various treatment modalities are used to treat urolithiasis nowadays. But these methods of treatment are having many drawbacks as given below-

1. Medical expulsive therapy (MET). It does not reduce the need of analgesic. Retrograde ejaculation and hypotension are also possible side effects.
2. Oral chemolysis is effective only for uric acid calculi.
3. ESWL (Extracorporeal Shock Wave Lithotripsy).

The success rate for ESWL will depend on the efficacy of the lithotripter, size & location of stone (ureteral, pelvic or calyceal), composition (hardness) of the stones & patient's habitus. Further, severe obesity prevent targeting of stone. Anatomical obstruction distal to the stone is also a contraindication to ESWL.

4. Endourology techniques

Percutaneous Nephrolithotomy (PCNL)—chances of haemorrhages are present. Perforation of collecting system, colon & pleural cavity can also occur.[9]

Dormia basket & Ureter meatotomy for ureteric calculus have possibilities of ureteric injury & urinary reflux respectively. [10]

5. Open surgery—The incidence of open surgery is 1.5% of all stone removal intervention in developed country & in developing countries, it has been dropped from 26% to 3.5% in recent years due to its complexity. [11]

Due to the complexity of this disease and high chances of recurrence after surgical removal Frere Jacques (The famous lithotomist of Middle Ages) used to say – “I have removed the stone, but God will cure the patient” [12]

6. Laproscopic surgery for removal of renal stones are invasive, have longer recovery time & greater risk of associated complications.

Thus in modern, the medical treatment is ineffective and lithotripsy or surgical techniques are invasive, costly and often related with complications. Even modern treatment is also not sufficient to stop recurrence of urolithiasis. Ineffectiveness of modern treatment and an alarming rise in the incidence of urolithiasis deals with a motivation provided by W.H.O. (World Health Organization) to explore the possibility of discovering cure on traditional line. It has created an impetus for further research in the light of Ayurvedic knowledge. Ayurveda has mentioned different modes of treatment of this disease by adopting the principle of not only treating the disease but also preventing the recurrence of disease. *Acharya Charaka* has described medicinal management whereas *Acharya Susruta* has described both conservative as well as surgical removal of *Ashmari*.

2. *Ashmari*—

Formation of *Ashma* (stone) like substances within the urinary system is called *Ashmari*. The manifestation of any disease is described in five steps in Ayurveda that are *Nidana*, *Purvarupa*, *Rupa*, *Upashaya* and *Samprapthi*. These are the five steps which helps the physician / surgeon to reach at a proper diagnosis.

Nidana includes all the etiological factors. The knowledge of *Nidana* is helpful for the proper diagnosis, prevention of disease and treatment. *Acharya Susruta* has described the causative factors of *Ashmari*. In person who do not undergo purification regularly and who indulge in unhealthy foods and activities, *kapha* gets aggravated, combines with urine, reaches the urinary bladder, staying there and produces *Ashmari*. [14]

The symptoms of *Ashmari* are excruciating pain over *Nabhi*, *Basthi*, at *Sevani*, or at *Medhra* during micturition, sudden stoppage of urine flow, blood stained urine, twisting and slitting of urine stream, aggravation of pain during running, jolting. Etc. [15] *Acharya Susruta* describe four types of *Ashmari* and gives importance to *Shleshma* (*Kapha*) in all type of *ashmari*. Similarly in modern system of medicine also describe that the Urinary salts bound together by a colloid matrix or organic materials. (*Shleshma*) [16]

3. Urolithiasis [17]

Lithiasis occurs in various forms and at various sites in the body, most common sites are urinary tract and biliary tract. Urolithiasis means the presence of a calculus in the urinary system. Urinary calculus is a stone like body composed of urinary salts bound together by a colloid matrix or organic materials; it consists of a nucleus around which concentric layers of urinary salts are deposited.

4. Aetiology [18]

The cause of renal stone formation is not yet fully understood but in majority of cases multiple factors are involved. The important factor which influence the formation and growth of uroliths are as follows;

Dietetic–Deficiency of vitamin A causes desquamation of renal epithelium which acts as a nidus around for stone is deposited.

Climate–In hot climate urinary solutes will increase with decrease in colloids, which leads to chelation of solutes forming a nidus for stone.

Citrate level– presence of citrate in urine maintain the calcium phosphate and carbonate in soluble state and any decrease in citrate level in urine causes stone formation.

Renal Infection- Infection favours the formation of urinary calculi. Urea splitting organisms commonly cause stone formation.

Prolonged immobilization–causes hypercalciuria causing multiple bilateral stones.

Inadequate urinary drainage and urinary stasis – Stones are liable to form when does not pass freely.

Randall's plaque–Randall suggested that initially a small erosion or ulcer develops at the tip of renal papilla on which minute concretions or minor calcium particles get deposited and give rise to stone formation.

Carr' postulates–states that minute concretions called as microliths normally develop in the subendothelial part of the tubule which will be carried away as particles by renal lymphatics network vessels. If these lymphatics are blocked, microliths enlarge and act as nidus for stone formation.

5. Risk Factors

Age [19]

Urolithiasis may occur at any age, but it is more common in between the third and fifth decades of life. Urinary calculi are unusual in children.

Sex

Urolithiasis is more frequently found in males than in females. The male female ratio is 4:3.

Geography [20]

Though urinary calculi prevail everywhere in the world but there are few countries and localities, which are more prone to this disease. The factor responsible for that are diet, water and climate.

Protein rich Diet

Vegetarians are at lower risk for stone formation in contrast to non-vegetarians. Animal protein induces stone formation by different mechanisms. Protein are responsible for high production of uric acid and excess excretion in urine may cause uric acid stone.

Protein ingestion generates renal acid load that gives rise to metabolic acidosis where by the urinary excretion of citrate is reduced.

Water [21]

Low fluid intake, excessive water losses in febrile disease and in hot climate leads to supersaturation of urinary environment. Supersaturation of urine is a prerequisite for calculus

formation and increased fluid consumption results in excretion of higher volume of urine, which is less supersaturated with stone-forming constituents.

6. Recurrence [22]

Urinary metabolic abnormalities such as low urine volume, hypercalciuria, hyperoxaluria, hyperuricosuria and hypocitraturia predispose a patient to early recurrence. Male gender, multiple stones, stone location, residual fragments and some anatomic or functional urinary tract abnormalities are known to be major risk factors for recurrence.

7. Type of stone [23]

Basically stones can be divided in to two groups-

I) Primary stones

Are those which appear in apparently healthy urinary tract without any antecedent inflammation. These stones are usually formed in acid urine. These stones usually consists of calcium oxalate, uric acid, urates, cystine, xanthine or calcium carbonate.

i) Calcium oxalate: This type of stone is usually single and is extremely hard. It is dark in color and irregular in shape and covered with sharp projections which tend to cause bleeding. This stone is popularly known as Mulberry stone.

ii) Uric Acid and Urate Calculi: They are hard, smooth and often multiple. Pure uric acid calculi are rare and not visible in X-ray. But in practice, majority of uric acid stone contains some calcium so they cast a faint radiological shadow. These stones are usually occur in multiple and so are typically faceted.

iii) Cystine calculi: They are rare. They are present in urinary tract of patients with a congenital error of metabolism that leads to cystinuria. Cystinuria is found in young girls at puberty. They are often multiple. These calculi are soft and yellow or pink in color. Pure cystine calculi are not radio-opaque, but as they contain sulphur they are usually radio-opaque.

iv) Xanthine calculi: These are extremely rare. They are smooth, round and brick red in color.

v) Indigo calculi: These are so uncommon that these are merely academic curiosities. These are blue in color and are derived from indican, formed by decomposition of tryptophan in the intestine and found in the urine.

II) Secondary stones

Are usually formed as a result of inflammation. The urine is usually alkaline, as urea splitting organisms are most often the causative factors. Secondary stones are mostly composed of calcium ammonium magnesium phosphate (triple phosphate).

i) Phosphate calculus

Majority of these stones are composed of calcium phosphate, though a few are composed of ammonium magnesium phosphate, known as 'triple phosphate'. Such calculus is usually smooth, soft and friable. It is usually dirty white in color. This type of calculus usually occur in infected urine. Urine is often alkaline. Such stone enlarges rapidly and gradually fills up the pelvis and renal calycesto take up the shape of 'staghorn calculus'.

ii) Mixed stone

Phosphate stone may occur as covering of a primary stone. Such stone are known as mixed stone.

8. Clinical Features

Following are the clinical features of calculi lying in different positions.

Renal Calculi [24]

Those are very common. The symptoms are variable and the diagnosis sometimes remains obscure until the stone is discovered on radiography. Common symptoms are; Quiescent calculus, Fixed renal pain at renal angle, referred pain, hematuria, pyuria, hydronephrosis.

Ureteric Calculi [25]

Ureteral stone usually originates in the kidney. Gravity and peristalsis both contribute to spontaneous passage into and down to the ureter. If a renal stone passes to the urinary bladder through ureter without any event, it is not detected. A ureteral stone is only detected when it causes some symptoms due to its presence in the ureter.

Ureteric colic, hematuria, nausea and vomiting are the clinical features of ureteric stone.

Vesical Calculi [26]

Clinically three types of bladder stone are noticed.

1. Usual type – which give rise to symptoms
2. Silent type – which is asymptomatic
3. Masked type – in this type of stone, symptoms of cystitis are dominant.

Frequency is more common during day than night. Pain and discomfort is particularly complained of at the end of micturition. Such pain refers to the tip of the penis or labia majora at the end of micturition, pain or discomfort is also complained of in suprapubic region. Dysuria and hematuria are often terminal.

Urethral calculi [27]

Stone from the bladder is commonly passed out through if it is small, but the stone get impacted due to a stricture or diverticulum. Migratory calculi cause sudden pain in the urethra soon after an attack of ureteric colic.

There is blockage to the flow of urine and if stone is small, the force of the jet will expel it from the external urethral meatus. Larger stone become stuck and may be palpable when it is in the bulbar or penile urethra.

9. Chikitsa

1. *Nidana Parivarjana* (to avoid cause)

The main treatment of any disease is to avoid the cause. *Ashmari* is a *Kapha* dominant disease, so all the measures that vitiate *Kapha* can be considered as cause of *Ashmari*. Similarly, all the measures leading to the control of *Kapha* can be considered as *Pathya*. But as urinary calculi are of different types, therefore some of its causes are common while some are variety specific.

Common Cause to Avoid:

Ativyayama (excessive physical work or exercise), *Adhyashana*, *Samashana*, *Sheeta*, *Snigdha*, *Guru*, *Madhura Ahara*, suppression of micturition and defaecation and heavy diets are treated as *Apathya* for *Ashmari* [28].

Vyayama, *Samdharana*, *Sushka*, *Ruksha Pishtanna*, *Vaataarka sevana*, *Vyavay*, *Kharjur*, *Shalook*, *Kapittha*, *Jambav*, *Bisma (kamal moola)*, *Kashayarasa sevana* etc. are also considered as *apathya* for *Ashmari* [29]. Other causes leading to perspiration should also be avoided. The ground water of some places contains excessive amounts of minerals contents which produces the urinary calculi so such water sources should be avoided by boiling or through filtration.

Avoidance of cause (According to type of stone) [30]

Calcium oxalate calculi—Spinach, rhubarb, tomatoes, cashew nuts, cucumber, black tea, cocoa asparagus, plums, strawberry and black grapes contain high amounts of oxalate so these food article should be avoided.

Uric acid calculi – Red meat, liver and fish are rich in purine so these food article should be avoided. A low purine diet should be prescribed.

Cystine calculi—Sulphur containing proteins such as meat, fish and eggs should be restricted.

2. To Dilute the Urine

The principle treatment of Ayurveda is to make the environment antagonist to the disease. As the stone is formed due to concentrated urine, therefore opposite to it is dilution of urine. When the urine is diluted it will not only stop the further increase in the stone, but increased hydraulic pressure in the kidney may also facilitate pushing of small stone which pass through urine.

By increase intake of water

By giving Mutral drugs – such as *Punarnava*, *Kush*, *Kash*, *Shar*, *Gokshura*, *Ikshu*, *Kankola*, *Hapusha* etc. [31]

Punarnava (*Boerhavia diffusa*)—Mutral property is due to *Madhura rasa* and *Madhura vipaka*.

Kush (*Desmostachya bipinnata*)—Mutral property is due to *Madhura rasa* and *Madhura vipaka*.

Kaash (*Saccharum spontaneum*)—Mutral property is due to *Sheet virya*, *Madhura rasa* and *Madhura vipaka*.

Gokshura (*Tribulus terrestris*)— Mutral property is due to *Madhura rasa* and *Madhura vipaka*.

Shar (*Saccharum munja*)—Mutral property is due to *Sheeta virya*, *Madhura rasa* and *Madhura vipaka*.

Ikshu (*Saccharum officinarum*)—Mutral property is due to *Guru* and *Snigdha guna*, *Sheetavirya*, *Madhura rasa* and *Madhura vipaka*.

3. Ayurvedic Anti-stone Drugs

Ayurveda describes many herbs having stone breaking action. Along with above mentioned measures when anti-stone drugs are used, the chances of breaking stone increases many times. Following are well known plants with stone breaking agents.

Pashanabheda (*Bergenia ligulata*)

Ashmari – *bhedana* property is due to *Tridosha shamaka karma*, *Mutral karma* and *Lekhana karma*.

Varuna (*Crataeva nurvala*)

Ashmari-bhedana, *Mutral* property is due to *Prabhava*. *Shoshana* of *Kapha* is due to *Tikta rasa*, *Kashaya rasa*. *Laghu guna*. *Ruksha guna*. *Deepana* property is due to *Ushna virya*.

Kulattha (Dolichos biflorus)

Ashmari-bhedana property is due to *Laghu Ruksha Thikshna guna, Kashaya rasa* and *Ushna virya*.

Yavakshara (Alkali preparation of Barley)

Chedana, bhedana and *lekhana* property are due to *prabhava*. [32] Antiurolithiatic activity is due to alkaline nature. Diuretic activity is due to potassium salts.

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