

## CASE REPORT

# Management of Renal Calculus through *Ayurveda*: A Case Report

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### ABSTRACT

**Introduction:** Renal calculus is one of the most common and prevalent diseases of urinary system. It affects all countries of the world with an approximate global lifetime prevalence of 15–20%. The etiology of renal calculus is multifactorial. It bears closest resemblance to *Vrikkashmari* in *Ayurveda*. Existing non-invasive treatment modalities available in contemporary medical science have limitations in terms of efficacy and cause various adverse effects. Hence, this study is aimed to explore effective alternate in the traditional systems for satisfactory management of this disease condition.

**Materials and Methods:** A 50-year-old female patient visited the OPD of an *Ayurveda* hospital with complaints of pain in the right and left flanks radiating to the lower back, burning micturition, and nausea and vomiting for 20 days. The USG report revealed about two renal calculi measuring 6 mm and 8 mm in the right and left kidneys, respectively. *Ayurvedic* medicines such as *Shweta Parpati*, *Hazrulyahud Bhasma*, *Gokshuradi Guggulu*, *Chandraprabha Vati*, and *Varunadi Kwatha* were given to the patient for 1 month.

**Results:** A significant remission was reported in clinical symptoms as well as in imaging findings after the use of this *Ayurvedic* treatment protocol.

**Discussion:** The significant clinical efficacy of the prescribed *Ayurvedic* treatment protocol is attributed to its therapeutic properties such as *Ashmari Bhedana*, *Mutrala*, *Deepana-Pachana*, *Vedanasthapana*, and *Shothahara*.

**Conclusion:** Encouraging results of this study shed light on the effectiveness of *Ayurvedic* management of renal calculus and boost up researchers to probe more in the same direction.

## 1. INTRODUCTION

The renal system consists of the kidney, ureters, and the urethra. The overall function of the system filters approximately 200 l of fluid a day from renal blood flow. Any pathological entity concerning to the renal system greatly affects the mechanism of homeostasis. Renal calculus (nephrolithiasis) is one of the most common and prevalent diseases of urinary system.

It affects all countries of the world with an approximate global lifetime prevalence of 15–20%. In India, 12% of the total population are anticipated to have renal stone disease.<sup>[1]</sup> According to the National Institute of

Diabetes and Digestive and Kidney Diseases, renal stones are most likely to occur in people between the ages of 20 and 50 years. Different factors can increase the risk of developing a stone. Multiple research studies conducted in the United States have consistently reported association of renal calculi with race. According to these studies, the prevalence of renal stone is higher in Caucasians than Africans or Afro-Americans.<sup>[2]</sup>

The etiology of renal calculus is multifactorial. Lifestyle habits and metabolic and hypercalcemic disorders are the key factors that are accountable for supersaturation of urine, thereby causing formation of renal calculus. It bears closest resemblance to *Vrikkashmari* in *Ayurveda*. *Vrikkashmari* (renal calculus) is described under *Ashta Mahagada* (difficult to cure) in *Ayurveda*.<sup>[2]</sup> The general features of *Vrikkashmari* include pain in umbilicus, bladder, perineal burning micturition, obstruction in flow of urine, hematuria, scattering of urine,

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and passing of *Gomeda* colored turbid urine with gravels. Moreover, a patient of *Vrikkashmari* experiences pain in the bladder when running, jumping, swimming, horse riding, or after a long journey.<sup>[3]</sup>

In both modern and *Ayurveda* science, a lot of research works have been already done on etiology, pathophysiology, and treatment of renal stone. Although existing non-invasive treatment modalities available in contemporary medical science provide marked analgesic effects, they have limitations in terms of efficacy and cause hazardous adverse effects. Hence, this is the need of the hour to explore effective *Ayurveda* treatment modalities for renal calculus. *Ayurvedic* medicines with properties such as *Ashmari Bhedana*, *Mutrala*, *Deepana*, *Pachana*, *Vedanasthapana*, and *Shothahara* can effectively help in disintegration of the pathogenesis of *Ashmari*.

### 1.1. *Nidana* of *Vrikkashmari*

According to *Acharya Sushruta*, there are two main *Nidana* of *Vrikkashmari*: *Asamshodhana* and *Apathya Sevana*.

### 1.2. *Samprapti* of *Vrikkashmari*<sup>[4]</sup>

According to *Acharya Sushruta*, the etiological factors such as abstaining from evacuative measures (*Samshodhana Karma*) to cleanse the internal channels and practice of unwholesome food further enrage the already aggravated *Kapha*. This aggravated *Kapha* got mixed with the urine and carried into the urinary bladder (*Basti*). Here, it becomes saturated with the urine and gives rise to the formation of concretions or gravels in its cavity.

### 1.3. *Samprapti Ghataka*

- *Dosha-Kapha*
- *Dushya-Mutra*
- *Srotodushti-Sanga*
- *Adhishthana-Basti*
- *Srotas-Mutravaha*
- *Agni-Jathragnimandhya*
- *Marga-Abhyantara*

## 2. MATERIALS AND METHODS

### 2.1. Case Study

#### 2.1.1. Patient information

In this study, a 50-year-old female patient visited the OPD of an *Ayurveda* hospital on 8<sup>th</sup> August 2022 with the following complaints:

- Colic pain in the right and left flanks (near the iliac region) radiating to the lower back
- Burning micturition
- Nausea (occasionally)
- Vomiting (occasionally).

She had been experiencing all these complaints for 20 days.

#### 2.1.2. History of present illness

The patient was asymptomatic 20 days ago. Afterward, she gradually developed the complaint of spasmodic pain in the right and left flanks radiating to the lower back. She also reported burning micturition and intermittent nausea and vomiting. The patient took allopathic treatment, but got only symptomatic relief for few days. To get permanent relief, the patient visited an *Ayurveda* hospital.

#### 2.1.2.1. Past history

She was a known case of hypothyroidism for 6 years. She had no history of diabetes mellitus, hypertension, and bronchial asthma.

#### 2.1.2.2. Surgical history

The patient underwent bilateral parathyroidectomy 5 years ago.

#### 2.1.2.3. Family history

No relevant familial history

#### 2.1.2.4. Menstrual history

Menses ceased at the age of 46 years.

#### 2.1.2.5. Obstetric history

G<sub>2</sub>P<sub>2</sub>A<sub>0</sub>L<sub>2</sub>

#### 2.1.2.6. Personal history

Appetite, sleep, and bowel habits were normal.

## 2.2. Clinical Findings

### 2.2.1. Vitals

- Temperature - 98.2° F
- Blood pressure - 130/90 mmHg
- Pulse rate - 76/min
- Respiratory rate - 18/min

## 2.3. Physical Examination

### 2.3.1. *Ashtavidha Prakisha* (~eightfold examination)

- *Nadi-Vata Pitta*
- *Mala-Samyak*
- *Mutra-Daha*
- *Jivha-Sama*
- *Shabda-Prakrita*
- *Sparsha-Ushna*
- *Druka-Prakrita*
- *Aakriti-Madhyama*

## 2.4. Systemic Examination

Tenderness is elicited in the right and left lumbar region of the abdomen on per abdomen examination. No other abnormality was detected during systemic examination.

## 2.5. Diagnostic Assessment

The patient underwent ultrasonography of the abdomen with pelvic organs on 2<sup>nd</sup> August 2022. The ultrasonography report revealed calculi of size ~6 mm and ~8 mm in midpole calix of the right and left kidneys, respectively. No evidence of hydronephrosis or mass lesion was seen in both kidneys. Corticomedullary differentiation was maintained.

## 2.6. Timeline

Complete timeline of the case is shown in Table 1.

## 2.7. Therapeutic Intervention

The treatment protocol prescribed to the patient is shown in Table 2.

## 2.8. Dietary Recommendations and Other Advices

The patient was advised to avoid protein-rich diets such as egg, meat, and soybean and oxalate-rich foods such as spinach, tomatoes, ladyfinger, chocolates, and cold drinks. She was also asked to avoid calcium supplements and drink plenty of water.

## 2.9. Assessment Criteria

To assess the effect of therapy, the scoring criteria are used as shown in Table 3.

### 3. RESULTS

#### 3.1. Follow-up and Outcomes

The patient was advised to follow up initially after 7 days. The complaints of nausea and vomiting were completely relieved. The patient reported mild relief in pain and burning micturition within 7 days of treatment. During the 2<sup>nd</sup> follow-up visit, the patient did not report burning micturition. However, intermittent dull ache in the right and left sides of the abdomen was still there on the second follow-up visit. The pain was completely relieved on the third follow-up and no other complaints were reported by the patient. A repeat ultrasonography scan was done on the 12<sup>th</sup> September 2022 that did not reveal any renal calculus [Table 4].

The patient was advised to carefully observe the diet and lifestyle restrictions to prevent the recurrence of calculus. No adverse events occurred during treatment and even after complete stoppage of the treatment.

### 4. DISCUSSION

The prescribed treatment protocol consists of array of therapeutic properties such as *Ashmari Bhedana* (lithotriptic), *Mutrala* (diuretic), *Vedanasthapana* (analgesic), *Shothahara* (anti-inflammatory), *Bastishodhana* (improve kidney functions), *Daha Shamaka*, and *Deepana-Pachana* (correct digestion and metabolism), which are quite effective in disintegration of pathogenesis of *Ashmari*. The particular action of each medicine is discussed below.

#### 4.1. Varuna Tvak Churna and Varunadi Kwatha

In a study conducted on albino rats having urolithiasis, it is found that Varuna prevents stone formation owing to the antilithogenic activity and the anticrystallization property.<sup>[5]</sup> One another study indicated that lupeol, a chemical constituent present in *Varuna*, deactivates glycolate oxidase enzyme. This enzyme catalyzes glycolate into oxalate. In turn, this oxalate augments the formation of kidney stones in the body on combining with calcium. Thus, activation of this enzyme reduces the formation of oxalates in the body, thereby decreasing the incidence of formation of calculi. In addition, it is also one of the potent natural diuretics that hinder the formation of stone by its constant flushing out action.<sup>[6]</sup>

#### 4.2. Gokshura Churna

The diuretic activity of *Gokshura* is attributed to the abundance of nitrates and essential oil in its fruits and seeds.<sup>[7]</sup> An antilithiatic protein named quercetin along with kaempferol present in *Gokshura* potentially inhibits nucleation and growth of calcium oxalate crystals.<sup>[8]</sup> Quercetin also inhibits the activity of glycolate oxidase, which is the principal enzyme involved in oxalate synthesis. It also possesses anti-inflammatory, analgesic, and antispasmodic action.

#### 4.3. Shweta Parpati

It is one of the most potent *Ayurvedic* alkalizers. It possesses therapeutic properties such as diuretic, analgesic, anti-inflammatory, and urinary supportive action, which accelerates blood flow to the kidneys, promote their functionality, and increase urine output. The alkaline nature of this formulation also prevents the bacterial growth in urinary tract.<sup>[9]</sup>

#### 4.4. Gokshuradi Guggulu

It is a multitherbal formulation containing drugs having *Mutral* (diuretic), *Ashmarighna* (lithotriptic), *Deepana-Pachana*,

*Vatashamaka*, and *Vednasthapana* properties. The cumulative actions of all these drugs include promotion of the urinary outflow, expulsion of calculus, antispasmodic action, and improvement in the blood supply to the renal apparatus.<sup>[10,11]</sup>

#### 4.5. Chandraprabha Vati

*Chandraprabha Vati* is a poly herbomineral formulation that is considered one of the best *Ayurvedic* drugs for the restoration of renal health. It effectively helps in the disintegration of renal calculi by virtue of its *Kapha-Vata Shamaka* and *Mutrala* properties.<sup>[12]</sup> Apart from this, it also prevents the manifestation of urinary tract infection (UTI) and hydronephrosis associated with renal calculi due to its antimicrobial and anti-inflammatory actions, respectively.<sup>[13]</sup> In one study, it is found that *Chandraprabha Vati* significantly restored the increased levels of the antimicrobial proteins, antimicrobial peptide Tamm-Horsfall protein, and inflammatory markers in mice with UTI.<sup>[14]</sup>

#### 4.6. Hazrulyahud Bhasma

Litholytic action of *Hazrulyahud Bhasma* is ascribed to its *Ashmaribhedana* and *Mutrala* properties. In one *in vitro* study, litholytic activity of *Hazrulyahud Bhasma* is evaluated in Artificial Urine (AU). The findings of this study revealed that *Hazrulyahud Bhasma* significantly increased the crystal inhibition in AU.<sup>[15]</sup>

### 5. CONCLUSION

Patients of renal calculi usually experience varying degrees of pain, which also hamper their day-to-day activities. Although invasive treatment completely cures the disease, most of the time patients opt for conservational treatment to avoid the surgical distress. In this regard, *Ayurveda* offers a large range of drugs to effectively manage the renal calculus without causing any adverse effect. From the encouraging results of this study, it can be inferred that prescribed *Ayurvedic* treatment protocol is very effective in the management of renal calculus.

### 6. ACKNOWLEDGMENTS

None.

### 7. AUTHORS' CONTRIBUTIONS

All the authors contributed equally in design and execution of the article.

### 8. FUNDING

Nil.

### 9. ETHICAL APPROVALS

This study not required ethical clearance as it is case study.

### 10. CONFLICTS OF INTEREST

Nil.

### 11. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

**12. PUBLISHERS NOTE**

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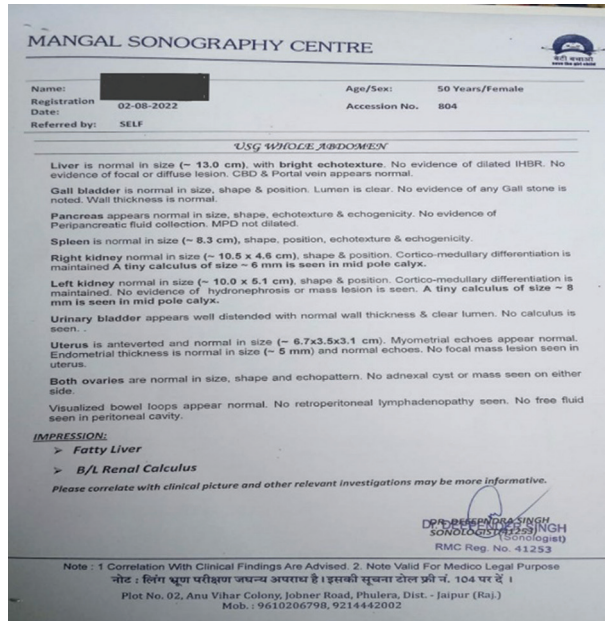
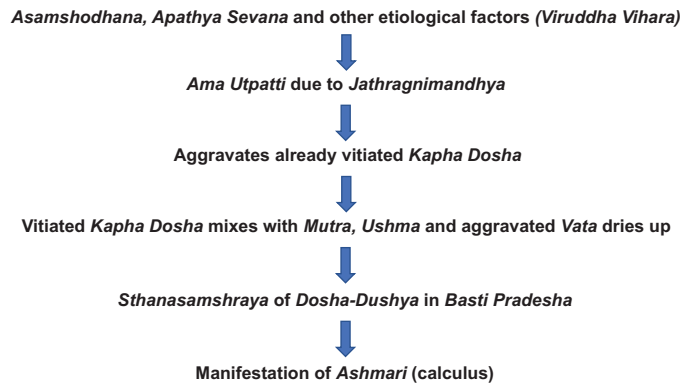
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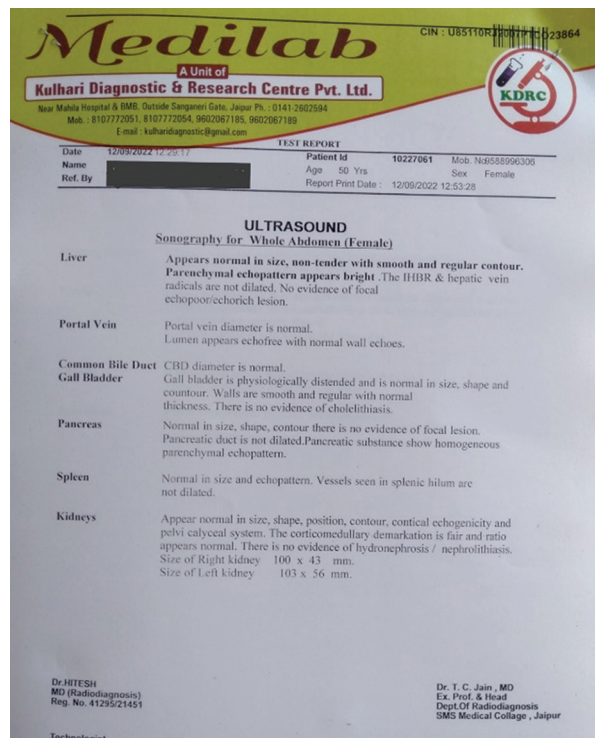
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FLOW CHART 1



Picture 1: USG report before treatment



Picture 1: USG report after treatment

**Table 1:** Timeline

Date	Relevant medical history
19 <sup>th</sup> July 2022	Gradual onset of spasmodic pain in right and left flanks
23 <sup>rd</sup> July 2022	Radiation of the pain to the lower back Burning micturition
25 <sup>th</sup> July 2022	Nausea followed by vomiting
26 <sup>th</sup> July 2022	Started allopathic treatment (Analgesic and antibiotic)
2 <sup>nd</sup> August 2022	Underwent imaging investigation
8 <sup>th</sup> August 2022	Consulted in OPD of Kriya Sharir Department, NIA Jaipur.

**Table 2:** Therapeutic intervention

Date	Medication and its dose	Anupana	Frequency and timing
8 <sup>th</sup> August 2022	<i>Varuna Tvak Churna</i> - 2 g <i>Gokshura Churna</i> - 1 g <i>Shweta Parpati</i> - 250 mg <i>Hazrulyahud</i> <i>Bhasma</i> -250 mg <i>Gokshuradi Guggulu</i> - 500 mg  <i>Chandraprabha</i> <i>Vati</i> -500 mg	<i>Varunadi</i> <i>Kwatha</i> 30 mL bd	Twice a day before meal     Twice a day after meal
16 <sup>th</sup> August 2022 (1 <sup>st</sup> Follow-up)	Continued same treatment		
30 <sup>th</sup> August 2022 (2 <sup>nd</sup> Follow-up)	Dose of <i>Varunadi Kwatha</i> is reduced to 20 mL+Rest of the treatment is continued as same		
12 <sup>th</sup> Sept 2022 (Visit)	<i>Chandraprabha</i> <i>Vati</i> -500 mg	Water	Once a day after meal for 7 days

**Table 3:** Assessment Criteria

Parameter	Grading
1. Pain	
No pain	0
Occasional pain but does not require treatment	1
Occasional pain that requires treatment	2
Constant dull pain, requires treatment	3
2. Burning Micturition	
No burning micturition, clear, easy micturition	0
Occasional burning but clear urine	1
Occasional burning micturition, mild pain after micturition, requires treatment	2
Constant burning micturition	3
3. Dysuria	
No dysuria	0
Occasional dysuria but does not require treatment	1
Occasional dysuria that requires treatment	2
Constant dysuria that requires treatment	3
4. Tenderness in Renal Angle	
No tenderness	0
Mild tenderness	1
Moderate tenderness	2
Severe tenderness	3
5. Nausea	
No nausea	0
Occasional nausea but does not require treatment	1
Occasional nausea that requires treatment	2
Severe nausea	3
6. Vomiting	
No vomiting	0
Intermittent episode of vomiting (1–2 times/week) but does not require treatment	1
Intermittent episode of vomiting (1–2 times/week) that requires treatment	2
Frequent episodes of vomiting (>2 times/week)	3

**Table 4:** Follow-up and outcomes

Parameter	BT Score	AT score		
		After 7 days	After 22 days	After 1 month
Pain	3	2	1	0
Burning Micturition	2	1	0	0
Dysuria	1	1	0	0
Tenderness in renal angle	1	1	0	0
Nausea	1	0	0	0
Vomiting	1	0	0	0