

REVIEW ARTICLE

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Therapeutic Potential of Unani Formulations in *Ḥaṣāt-i-Kulya* (Nephrolithiasis): A Clinical Case SeriesKM Gulista Khan¹, Mohammad Asif Khan^{*1}, Rushda Saeedi²^{1,2}Department of *Jarahat*, National Institute of Unani Medicine, Ghaziabad, India³Department of *Niswan wa Qabalat*, National Institute of Unani Medicine, Ghaziabad, India

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Abstract

Background: Urolithiasis is a common urological disorder with considerable global prevalence and recurrence. In Unani medicine, stone formation is attributed to dietary excesses, impaired digestion, and weakened renal expulsive power. Traditional Unani therapies have historically been employed for the dissolution and expulsion of urinary calculi. **Objective:** To evaluate the clinical efficacy and safety of a selected Unani formulation in the management of urolithiasis. **Case Series:** A prospective case series was conducted in 2025 at the National Institute of Unani Medicine. Five patients diagnosed with urolithiasis by ultrasonography were included. Patients received a standardized Unani regimen comprising *Ajwain* (*Trachyspermum ammi*), *Tukhm Karafs* (*Apium graveolens*), and *Tukhm Jirjeer* (*Eruca sativa*). Clinical symptoms, including flank pain, dysuria, haematuria, and urinary frequency, were assessed weekly along with ultrasonographic evaluation. Results: All five patients demonstrated complete stone clearance following treatment. Significant symptomatic improvement was observed in flank pain, dysuria, haematuria, and urinary frequency. Ultrasonography confirmed fragmentation and passage of urinary stones. No adverse drug reactions or complications were reported during the treatment period. Conclusion: The selected Unani formulations demonstrated promising efficacy and safety in managing urolithiasis, offering a non-invasive and cost-effective therapeutic option.

KEYWORDS: *Ḥaṣāt-i-Kulya*; Nephrolithiasis; Urolithiasis; Unani Medicine; Herbal Formulations.

1. INTRODUCTION

Urinary stone disease (urolithiasis) is one of the oldest documented human disorders, with archaeological evidence from Egyptian mummies (≈4800 BC) and Native American remains (1500–1000 BC) indicating its widespread occurrence across civilizations [1-4]. Medical recognition appears in Hippocratic writings (4th century BC), which described renal calculi with abscesses and cautioned against lithotomy because of its high morbidity and mortality. This concern was formalized in the Hippocratic Oath, where physicians pledged not to “cut for stone” [1,2]. These historical references underscore urolithiasis as both a clinical condition and a subject of ethical and philosophical discourse in early medicine, forming the foundation for later medical traditions, including Unani concepts of nephrolithiasis [2]. Avicenna (Ibn Sīnā), in *Al-Qānūn fī al-Ṭibb*, emphasized that *Māddah Fāsida* (morbid matter) and *Ghalīz Māddah* (viscid matter), originating from heavy foods, contribute to the formation of renal calculi. Weak *Quwwat Hāḍima* (digestive power) and *Quwwat Dāfi'a* (expulsive faculty) permit the accumulation of such morbid matter within the kidneys, while *Sū'-i-Mizāj*, *Warm-i-Hārr*, and *Qurūḥ al-Kuly* further aggravate the condition. According to Unani philosophy, excessive *Ḥarārat* (heat) solidifies these materials into

stones [1,2,5,6]. *Ibn al-Majūsī* associated *Shadīd Ḥarārat* and *Khilt Ghalīz* with stone formation, whereas *Zakariyyā al-Rāzī*

described *Lasdār Mawād* (adhesive substances) that harden under excessive heat. Avicenna also highlighted the roles of *Quwwat-e-Fā'ilah* and *Māddat al-Ḥiṣāt* in lithogenesis [2,6,7]. Similar views were echoed by *Ibn Zuhr*, *Jālīnūs*, and *Zakariyyā al-Rāzī*. Unani literature further describes the age and sex distribution of urinary calculi, noting that renal stones are more common in middle-aged men and bladder stones in children [4,6,8]. *Jurjānī* attributed this predisposition to anatomical differences, *Ghalīz Ghidhā'* (heavy diet), excessive intake of milk, paneer, rice, and alcohol, along with irregular lifestyle habits and excessive *harārat* [6,9]. These classical descriptions exhibit notable parallels with the contemporary understanding of stone pathogenesis.

Nephrolithiasis has been managed since antiquity within the Unani system of medicine, which emphasizes the use of herbo-mineral formulations as non-invasive alternatives to surgical intervention. The therapeutic approach is based on fundamental principles, including excessive hydration, *Tafīṭ-i-Ḥaṣāt* (litholysis), *Idrār-i-Bawl* (diuresis), *Tahlīl-i-Awrām*.

(resolution of inflammation), and *Taqwiyat-i-Kulya* (nephroprotection). Collectively, these strategies aim to dissolve calculi, facilitate urinary clearance, reduce renal inflammation, and preserve renal function[2,3]. Urolithiasis is one of the most common urological diseases, affecting approximately 15% of the global population and about 2.3% of the Indian population[1,2]. The lifetime risk of developing urolithiasis is estimated to be nearly 10%.⁴ The incidence rates range from 1–5% in Asia, 5–9% in Europe, and nearly 12% in Canada, while the United States reports prevalence rates between 13% and 15%. A notably high incidence of 20.1% has been documented in Saudi Arabia. Nephrolithiasis is more common in men (12%) than in women (6%), with peak incidence between 20 and 40 years of age in both sexes [10]. Despite considerable advances in modern surgical and pharmacological management, recurrence, treatment-related complications, high costs, and invasive procedures continue to pose significant challenges in the management of urolithiasis. Although classical Unani literature describes several lithotriptic and diuretic formulations for the treatment of *Haṣāt-i-Kulya*, scientific clinical evidence regarding their efficacy and safety remains limited. Furthermore, there is a paucity of documented case series evaluating standardized Unani regimens in nephrolithiasis. Therefore, there is a growing need to explore safe, economical, and non-invasive therapeutic alternatives. Hence, the present case series was undertaken to evaluate the clinical efficacy and safety of selected Unani formulations in the management of *Haṣāt-i-Kulya* (nephrolithiasis).

2. Material and methods

Study Design and Setting

This prospective case series was conducted during 2025 at the outpatient department of the National Institute of Unani Medicine, Ghaziabad. The study included five consecutive patients presenting with clinical and radiological features suggestive of urolithiasis. Patients primarily sought medical care for acute renal colic, flank pain, dysuria, and associated lower urinary tract symptoms.

Ethical Considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Written informed consent was obtained from all patients before participation and publication of anonymized clinical information and radiological findings.

Inclusion Criteria

Patients fulfilling the following criteria were included in the study:

- Age above 18 years
- Ultrasonographically confirmed renal or ureteric calculi
- Presence of symptoms suggestive of urolithiasis such as flank pain, dysuria, haematuria, or increased frequency of micturition
- Willingness to undergo Unani treatment and regular follow-up.

Exclusion Criteria

Patients with the following conditions were excluded:

- Severe obstructive uropathy requiring emergency surgical intervention
- Chronic kidney disease or renal failure
- Active urinary tract infection with systemic complications
- Pregnancy or lactation
- Known malignancy or severe systemic illness

Diagnostic Assessment

At the initial visit, detailed clinical histories were obtained, including demographic details, dietary habits, water intake, bowel and urinary habits, associated symptoms, past medical history, family history, and *Mizāj* (temperament). General physical and systemic examinations were performed in all cases. Ultrasonography (USG KUB/whole abdomen) was advised to confirm the diagnosis and document the size, number, and anatomical location of calculi. Routine urine examination was also performed where indicated. Differential diagnoses such as urinary tract infection, pyelonephritis, appendicitis, and other causes of abdominal pain were clinically excluded before confirming the diagnosis of urolithiasis.

Unani Intervention

All patients received a standardized Unani formulation consisting of *Ajwain* (*Trachyspermum ammi*) and *Tukhm Karafs* (*Apium graveolens*), each in a dose of 1 Tola and 5.5 Masha (approximately 17 g), along with *Tukhm Jirjeer* (*Eruca sativa*) in a dose of 3.5 Masha (approximately 3 g). The ingredients were powdered to prepare a *Sufoof* formulation. Patients were advised to take 7 *Masha* (approximately 6.8 g) orally with normal water, as described in classical Unani literature[11]. *Tukhm Jirjeer* (*Eruca sativa*) has a beneficial effect on the kidneys; it acts as a *Mudirr-i-Bawl* (diuretic), a detoxifying agent, and a resolvent. *Mufattiḥ-i-Sudad* (Deobstruent), *Mufattit-i-Hasah* (Lithotriptic), *Musakhin* (Analgesic)[12,13]. Dysuria, Renal dysfunction, and Kidney stone [14,15]. Antioxidant effect[16]. nephroprotective effect[17].

Tukhm karfas (*Apium graveolens*)- Nephroprotective, it belongs to a group of plants that potentially treat kidney stones[18], it is one of the natural substances that have anti-inflammatory, antioxidant, and antihypertensive pharmacological effects[19], anticalculi[20], activity, diuretic, anthelmintic, antispasmodic, carminative, diuretic, emmenagogue, laxative, sedative, stimulant[21], anti-inflammatory, analgesic, litholytic, diuretic[12], *Ajwain* (*Trachyspermum ammi*): Diuretic, Analgesic, Anti-inflammatory, antioxidant, carminative, anticalculus[22], diuretic, litholytic[12], All the prescribed Unani formulation were pharmacopeial preparations as described in National formulary of Unani Medicine, and were prepared in accordance with *Bayaz-e-kabir*, Volume-1 In addition to pharmacological treatment, patients were advised increased fluid intake, dietary modification, and conservative management measures.

Follow-up and Outcome Assessment

Patients were followed up at weekly intervals initially and thereafter according to clinical response. During each follow-up visit, symptomatic improvement and treatment adherence were assessed. Patients were instructed to report immediately in the event of severe pain, fever, urinary retention, haematuria, or any acute emergency symptoms.

Ultrasonography was repeated after three months to evaluate stone size, fragmentation, and clearance. Treatment outcomes were assessed using both subjective and objective parameters. Subjective parameters included flank pain, dysuria (*Usr al-Bawl*), haematuria, urinary retention (*Ihtibās*

al-Bawl), and increased frequency of micturition (*Kathra al-Bawl*). Objective parameters included number, size, and location of calculi on ultrasonography. Patients demonstrating symptomatic relief along with absence of calculi on ultrasonography were considered clinically improved.

Safety Assessment

All patients were monitored for adverse drug reactions and treatment-related complications throughout the study period. No adverse effects or significant complications were observed during therapy (Table no. 1).

Table No. 1: Assessment criteria[1]

Objective symptoms	Grading			
	0	1	2	3
Size of stone	No change	<5mm	5-10mm	>10mm
No of stone	No change	1 stone	2 stone	>3 stones
Subjective symptoms				
Pain in flank	No pain	Bearable pain, medicines not required	Bearable pain, medicines required	Unbearable pain
<i>Usr al-Bawl</i> (dysuria)	No dysuria	Occasional dysuria	Regularly, medicine not required	Regular dysuria, required medication
<i>Ihtibās al-Bawl</i> (retention of urine)	No retention	Occasional retention	Regular partial retention	Regular complete retention
<i>Kathra al-Bawl</i> (increased frequency of micturition)	Up to 6 times	7-9 times	10-12 times	>12 times

Case Presentation

Case 1

Patient Information

A 42-year-old woman presented to the outpatient department of the National Institute of Unani Medicine with complaints of recurrent sharp colicky pain in the right flank radiating to the suprapubic region, labia majora, and thigh. Associated symptoms included nausea, vomiting, dysuria, burning micturition, foul-smelling urine, and increased urinary frequency. There was no history of diabetes mellitus, hypertension, previous surgery, blood transfusion, or renal stone disease in the family. Her *Mizāj* was assessed as *Damwī*.

Clinical Findings

On examination, the patient appeared anxious and mildly dehydrated due to severe colicky pain. Vital parameters revealed a pulse rate of 110/min, a respiratory rate of 18/min, a blood pressure of 134/82 mmHg, and afebrile. Mild right renal angle tenderness was present on local examination, while systemic examination was otherwise unremarkable.

Diagnostic Assessment

Ultrasonography (USG KUB) demonstrated a single right upper ureteric calculus measuring 5.5 mm with mild hydronephrosis and moderate dilatation of the pelvicalyceal system. Differential diagnoses including urinary tract infection and appendicitis were clinically excluded.

Therapeutic Intervention

The patient was prescribed a Unani *Sufoof* formulation comprising *Ajwain* (*Trachyspermum ammi*), *Tukhm Karafs* (*Apium graveolens*), and *Tukhm Jirjeer* (*Eruca sativa*) in standardized doses. She was additionally advised to increase

fluid intake, make dietary modifications, and use conservative management measures.

Follow-up and Outcomes

At the first follow-up, burning micturition showed mild improvement, although flank pain persisted. Subsequent weekly follow-ups demonstrated gradual reduction in pain and urinary symptoms. Follow-up ultrasonography performed in October 2025 revealed complete stone clearance with no residual calculus. The patient remained asymptomatic and was advised preventive counseling and routine follow-up.

Patient Perspective

The patient reported marked relief in pain and urinary discomfort and expressed satisfaction with the non-invasive and economical nature of the Unani treatment.

Case 2

Patient Information

A 40-year-old man presented with right flank pain associated with nausea, vomiting, dysuria, and burning micturition. He had a history of erosive antral gastritis with complaints of acidity and flatulence aggravated after meals. There was no history of diabetes mellitus, hypertension, surgery, or other systemic illness. His *Mizāj* was *Ṣafrāwī*.

Clinical Findings

The patient appeared dehydrated and distressed because of abdominal pain. Mild tenderness was present in the right renal angle and epigastric region. Vital signs showed a pulse rate of 94/min, respiratory rate of 16/min, blood pressure of 118/76 mmHg, and temperature of 99.7°F.

Diagnostic Assessment

Ultrasonography revealed a 6.3-mm left middle calyceal calculus and an 8.8-mm calculus at the right ureterovesical junction. Differential diagnoses such as gastritis-related abdominal pain and urinary tract infection were excluded clinically.

Therapeutic Intervention

The patient received the standardized Unani formulation along with advice regarding hydration, dietary regulation, and conservative management. During follow-up visits, dysuria and pain gradually improved, and appetite normalized. Ultrasonography performed in November 2025 demonstrated complete clearance of both calculi. The patient became symptom-free and renal function remained normal. Preventive counseling was advised to reduce the risk of recurrence.

Patient Perspective

The patient reported satisfactory symptomatic relief without adverse effects and appreciated the avoidance of surgical intervention.

Case 3

Patient Information

A 61-year-old man presented with left flank pain, burning micturition, urinary hesitancy, nausea, vomiting, and heaviness in the abdomen. There was no history of diabetes or previous surgery, although a family history of hypertension was present. His *Mizāj* was *Balghamī*.

Clinical Findings

General examination showed dehydration and distress due to urinary complaints. Vital signs revealed a pulse rate of 98/min, a respiratory rate of 18/min, a blood pressure of 142/88 mmHg, and afebrile status. Mild tenderness was present in the epigastric region. Digital rectal examination revealed grade I prostatomegaly.

Diagnostic Assessment

USG KUB demonstrated a 5-mm left mid-pole renal calculus, grade I prostatomegaly, and mild post-void residual urine. Urine routine examination was within normal limits.

Therapeutic Intervention

The standardized Unani *Sufoof* formulation was prescribed along with hydration advice and dietary modifications.

Follow-up and Outcomes

Symptoms gradually improved over serial follow-ups, particularly burning micturition and flank pain. Repeat ultrasonography in November 2025 showed complete clearance of renal calculi and a reduction in the size of prostatomegaly.

Patient Perspective

The patient expressed satisfaction with the gradual improvement of urinary symptoms and the non-invasive nature of the therapy.

Case 4

Patient Information

A 38-year-old woman presented with severe right flank pain radiating to the inner thigh, accompanied by nausea, vomiting, dysuria, hesitancy, and severe colicky pain. There was no significant medical or surgical history. Her *Mizāj* was *Balghamī*.

Clinical Findings

The patient appeared dehydrated and distressed due to severe episodic pain. Mild pallor and epigastric tenderness were noted. Vital parameters were within normal limits.

Diagnostic Assessment

Ultrasonography revealed a 3.9 mm right renal upper pole calculus and an 8.7 mm stone in the right terminal ureter associated with proximal hydroureteronephrosis.

Therapeutic Intervention

The patient received the standardized Unani formulation along with advice regarding hydration and dietary regulation.

Follow-up and Outcomes

Progressive improvement in pain and dysuria was observed during weekly follow-up visits. Follow-up ultrasonography performed in February 2026 demonstrated complete stone clearance with normal radiological findings.

Patient Perspective

The patient reported substantial relief in colicky pain and improvement in quality of life after treatment.

Case 5

Patient Information

A 50-year-old woman presented with right flank pain, nausea, and burning micturition. She was a known case of diabetes mellitus, hypertension, and thyroid dysfunction and was receiving treatment for these conditions. Her *Mizāj* was *Balghamī*.

Clinical Findings

On examination, the patient appeared mildly dehydrated with flank tenderness and burning micturition. Vital signs were stable. Mild pallor was present. Ultrasonography demonstrated a 4 mm right upper pole renal calculus with an associated simple renal cyst. Urine examination was within normal limits.

Therapeutic Intervention

The patient was treated with the standardized Unani *Sufoof* formulation together with dietary and hydration advice.

Follow-up and Outcomes

During follow-up, flank pain and dysuria progressively improved. Repeat ultrasonography in November 2025 demonstrated complete clearance of renal calculus. No treatment-related adverse effects were observed.

Patient Perspective

The patient reported satisfactory relief in symptoms and preferred the Unani regimen because it was affordable and avoided invasive procedures.

Table no. 2(a): Efficacy of drug on subjective parameters.

Symptoms	Case 01		Case 02		Case 3		Case 04		Case 05	
	Pre treatment	Post treatment	Pre treatment	Post treatment	Pre treatment	Post Treatment	Pre treatment	Post treatment	Pre treatment	Post treatment
Pain in flank	3	0	3	0	3	0	3	0	2	0
Ushr al-Bawl (dysuria)	3	0	3	0	3	1	3	0	2	0
Haematuria	1	0	0	0		0	1	0	0	0
Kathra al-Bawl (increased frequency of micturition)	2	0	2	0	3	1	3	0	1	0

Table 2-B Efficacy of drug on objective parameters.

Symptom	Case 01		Case 02		Case 03		Case 04		Case 05	
	Pre treatment	Post treatment	Pre treatment	Post treatment	Pre treatment	Post treatment	Pre treatment	Post treatment	Pre treatment	Post treatment
Size of stone	5.5 mm in right ureter	No stone found	6.6 mm In left kidney 8.8 mm in UB	No stone found	5.0 mm	No stone found	3.9 mm in right kidney and 8.7 in right terminal ureter	No stone found	4 mm in right kidney	No stone found
Number of stones	1	0	2	0	1	0	2	0	1	0

RESULT

The present case series included five patients diagnosed with urolithiasis presenting with symptoms such as flank pain, dysuria, haematuria, burning micturition, nausea, vomiting, and increased urinary frequency.

Most patients were middle-aged adults, and ultrasonography reliably confirmed the diagnosis by identifying the size, number, and anatomical location of calculi. Stone sizes ranged from 3.9 mm to 8.8 mm, with involvement of renal and ureteric locations. All patients were managed conservatively using standardized Unani formulations along with hydration and dietary advice.

During follow-up, all patients demonstrated progressive symptomatic improvement. Flank pain and dysuria resolved completely in almost all cases, while urinary frequency and burning micturition markedly improved. Follow-up ultrasonography confirmed fragmentation and complete passage of calculi in all five patients, with no residual stones detected after treatment. No adverse drug reactions or treatment-related complications were observed during the study period.

Overall, the findings suggest that the prescribed Unani regimen may be effective in achieving symptomatic relief and radiological clearance of urinary calculi in selected cases of nephrolithiasis.

DISCUSSION

This prospective case series highlights the therapeutic potential of Unani medicine in the management of urolithiasis. The study integrated classical Unani principles with modern diagnostic evaluation and demonstrated that individualized Unani formulations can provide both symptomatic relief and radiological resolution of urinary calculi. Across all five cases, marked improvement was

observed in flank pain, dysuria, haematuria, and urinary frequency, and ultrasonography confirmed stone fragmentation and complete stone passage. The findings of the present study are consistent with previous Unani studies and reviews, including Management of *Haṣā wa Raml al-Kulya* (Nephrolithiasis) with Unani Medication and Regimental Therapy, Efficacy of *Majoon Sang Sar-e-Mahi* in the Management of *Haṣāt-e-Bauliyah* (Urolithiasis): An Exploratory Clinical Trial, Unani Concept of Nephrolithiasis (*Hiṣāt-e-Kulyah*) and Its Management – An Overview, and Medicinal Treatment of Multiple Renal Calculi (*Hiṣāt-e-Kulyah*) and Bilateral Ureteric Calculi (*Hiṣāt-e-Ḥalīb*) by Unani Pharmacopoeial Formulations – A Case Study. These studies similarly reported symptomatic improvement, enhanced urinary clearance, and a reduction in stone burden following Unani interventions.^{1, 2, 4, 23} The Unani therapeutic approach adopted in this study emphasized a holistic assessment that considered Mizāj (temperament), dietary habits, and overall systemic health alongside pharmacological management. The prescribed formulation comprising *Ajwain* (*Trachyspermum ammi*), *Tukhm Karafs* (*Apium graveolens*), and *Tukhm Jirjeer* (*Eruca sativa*) was selected based on its classical indications in Unani literature^[11,12]. These drugs possess *Mufattit-i-Haṣāt* (lithotriptic), *Mudirr-i-Bawl* (diuretic), *Muḥallil-i-Awrām* (anti-inflammatory), antioxidant, and nephroprotective properties, which may have facilitated dissolution and expulsion of calculi^[12–22]. Contemporary pharmacological studies also support the diuretic, antispasmodic, antioxidant, and anti-inflammatory activities of these ingredients, thereby providing scientific rationale for their therapeutic role in nephrolithiasis^[13].

The clinical observations in the present study also correlate with classical Unani concepts of nephrolithiasis. Unani scholars such as *Ibn Sīnā* and *Jurjānī* attributed stone

formation to *Ghalīz Ghidhā'* (heavy diet), impaired *Quwwat Hāḍima* (digestive faculty), and weakened *Quwwat Dāfi'a* (expulsive power), resulting in retention and solidification of morbid matter within the kidneys. The occurrence of calculi in middle-aged individuals, associated dietary factors, and presenting symptomatology observed in this study parallel these traditional descriptions. Furthermore, these concepts exhibit notable similarities to the contemporary understanding of stone pathogenesis, which involves dietary excess, metabolic imbalance, urinary stasis, and crystallization. Despite encouraging outcomes, the present study has certain limitations. The small sample size and absence of a control group restrict the generalizability of the findings. In addition, long-term follow-up was not performed to evaluate recurrence rates. Nevertheless, the complete symptomatic and ultrasonographic resolution observed in all five cases suggests that Unani formulations may serve as safe, economical, and non-invasive therapeutic alternatives or adjuncts to conventional management, particularly for patients seeking non-surgical treatment options. Further large-scale randomized controlled trials are warranted to validate these findings and establish standardized evidence-based treatment protocols for urolithiasis within the framework of Unani medicine.

Conclusion

This case series demonstrates that Unani medicine, when applied through individualized therapeutic approaches and supported by modern diagnostic imaging, may effectively manage urolithiasis. The prescribed Unani formulation not only alleviated clinical symptoms but also resulted in complete stone clearance in all five patients. No adverse effects or treatment-related complications were observed during the study period. These findings support the potential clinical efficacy and safety of Unani interventions in nephrolithiasis management.

The study contributes toward bridging classical Unani knowledge with contemporary clinical practice by demonstrating that Unani formulations may serve as complementary or alternative therapeutic options in selected cases of urolithiasis. The findings further suggest that Unani therapy may offer a safe, economical, and non-invasive approach for patients seeking conservative management of nephrolithiasis. However, the findings should be interpreted with caution due to the small sample size and the absence of a control group. Further large-scale randomized controlled trials are warranted to establish the efficacy, safety, and long-term outcomes of these interventions. Nevertheless, the present study highlights the enduring relevance of Unani medicine in managing a globally prevalent condition and underscores its potential role in integrative urological care. Informed Consent: Written informed consent was obtained from all patients for publication of anonymized clinical data and radiological findings.

Conflict of Interest

The authors declare no conflict of interest.

Funding: No external funding was received for this study.

Ethical Approval: In accordance with institutional guidelines, formal ethical approval from the Institutional Ethics Committee was not required for this case series. Written informed consent was obtained from all patients for participation and publication of anonymized clinical data and images.

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