V Edition of the Clinical Cases Contest on

non-surgical clinical management of Kidney Stones

Title: Treatment of Post-Open Surgery lithiasic patient with residual stone

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1. Abstract

This case report details the challenges and management strategies for a patient with Urolithiasis.

We report a case of a 44-year-old, Female, who initially presented with a 1- year history of on and off bilateral flank pain and lower urinary tract symptoms. She was diagnosed to have an Obstructing Urolithiasis bilateral and Nephrolithiasis bilateral. Patient underwent Cystoscopy Ureteroscopy bilateral, stent insertion left and Nephrostomy tube insertion right and was advised for renal scan after 6 weeks. Patient was then readmitted with results of CT stonogram, and Renal scan showing good function of bilateral kidneys and was advised for operation. She underwent Cystoscopy stent removal left, Ureterolithotomy right stent insertion right. Patient nephrostomy tube was maintained and was given oral chemolysis (Lit Control pH Balance) for residual inferior pole stones left. Patient was reevaluated after 2 months repeat CT stonogram was done and noted dissolution and decrease in size of residual stones.

2. Introduction

Renal stones, also known as nephrolithiasis, form within the kidneys. When these stones move from the renal pelvis into the rest of the urinary collecting system, including the ureters, bladder, and urethra, the condition is referred to as urolithiasis. Many cases of urolithiasis can be managed conservatively with pain relief, antiemetic medications, and observation. However, stones causing obstruction, renal failure, or infection require more urgent and intensive interventions. (1)

Urolithiasis occurs when solutes crystallize out of urine, forming stones. Contributing factors include urinary stasis, low urine volume, dietary habits (e.g., high oxalate or sodium), infections,

systemic acidosis, certain medications, and rare genetic conditions like cystinuria.

The majority (75%-85%) of kidney stones are calcium-based, primarily calcium oxalate or calcium phosphate. Other types include uric acid (8%-10%), struvite (7%-8%), and cystine stones (1%-2%). (5)

Kidney stone risk increases with age, peaking in men over 80. Incidence is rising faster in children and adolescents, with female adolescents most affected in this group. Black and Hispanic populations have the lowest rates, influenced by socioeconomic factors, healthcare access, and diet rather than genetics.

3. Clinical Case description

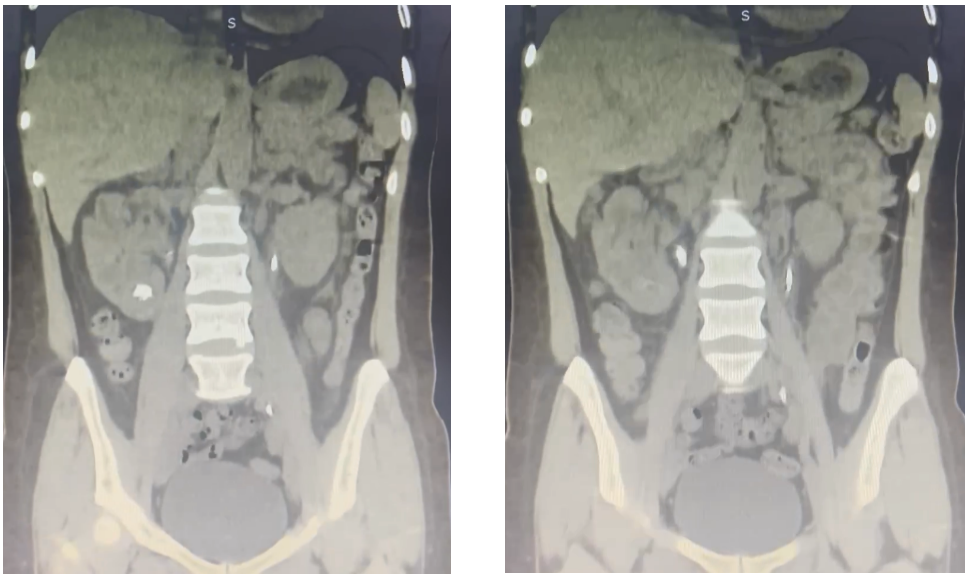
a. Patient information / Medical records

We report a case of a 44-year-old, Female, who presented with a 1- year history of on and off bilateral flank pain and lower urinary tract symptoms. Work up was done and she was diagnosed to have an Obstructing Urolithiasis bilateral and Nephrolithiasis bilateral. underwent Cystoscopy Ureteroscopy bilateral, stent insertion left and Nephrostomy tube insertion right and was advised for renal scan after 6 weeks. 1 month prior to admission, he sought consult at outpatient department due to persistence of her symptoms with results of Renal Scan with good function on bilateral kidneys and repeat CT Stonogram was requested.

b. Diagnostic support studies and results

On Physical examination, there were no remarkable findings. On repeat imaging, CT Stonogram (Fig. 1) revealed showed calcific densities at proximal ureter right measuring 2x 1.3cm (HU 1520) and a lower pole stones right kidney measuring 1.3x1.3cm (HU 877) as well as a nephrostomy tube placed. While on left kidney noted stent placed, and 0.9x 0.7cm stones (HU 895). Intraoperatively, Cystoscopy, stent removal left; retrograde pyelogram right; Ureterolithotomy right, stent insertion right was done and noted approximately 2cm proximal ureteral stone.

Fig 1. Plain CT scan pre-operatively



c. Treatment

Intraoperatively, Cystoscopy, stent removal left; retrograde pyelogram right; Ureterolithotomy right, stent insertion right was done and noted approximately 2cm proximal ureteral stone. (Fig.2)

Fig 2. Intraoperative Findings

d. Evolution and progress

Upon discharge, the patient was advised to continue oral chemolysis (Lit Control pH Balance) and K Citrate. She was educated about the presence of an indwelling stent as well as its removal post-surgery post operatively, patient was requested with repeat CT stonogram and KUB Xray.

e. Clinical results

Repeat CT stonogram was done and revealed decrease in size of residual stones from 1.3cm to 0.8cm as well as no noted encrustations on stent, hence patient was advice for stent removal and to continue medications. (Fig 3)

Fig 3. Plain CT scan post operatively

4. Discussions

Urinary stones are a common cause of morbidity in individuals living in affluent, industrialized societies. Over the past generation, the management of symptomatic stones in the upper urinary tract has undergone significant changes, driven by the development of increasingly less invasive treatment techniques. These advancements have been paralleled by a revolution in radiologic

imaging and interventional methods, which have further enhanced diagnostic and therapeutic capabilities. (2)

While medical dissolution therapy for existing calcium-based stones has shown limited success, therapeutic regimens tailored to patients' metabolic evaluations have proven effective in preventing stone recurrence. Laboratory analysis of all passed or removed calculi is a crucial component of these preventive strategies. Uric acid stones, often large, can be effectively managed with oral urinary alkalinizing agents and increased fluid intake. Some cystine stones can gradually dissolve with medication, and recurrence prevention in such cases has shown moderate success. For patients with recurrent urinary tract infections associated with struvite stones, antibiotic therapy may help control infections, particularly in those who are not ideal candidates for surgery. (2)

The antioxidant activity of polyphenols extracted from red and white grape seeds may play a significant role in preventing calcium oxalate monohydrate (COM) papillary calculi. These polyphenols help protect papillary tissue from injury caused by cytotoxic substances with oxidative properties. Their antioxidant effects are demonstrated to prevent oxidative damage to cell membranes and DNA by scavenging reactive oxygen species and chelating metal ions. (3)

Grape seed extract (GSE) was found to reduce the number of oxalate crystals and key urolithiasis promoters, including excreted calcium, oxalate, phosphate, and uric acid. It also improved renal function parameters, decreased lipid peroxidation, and reduced inflammatory mediators. In conclusion, GSE may protect against ethylene glycol (EG)-induced renal stones by mitigating kidney dysfunction, histological damage, and oxalate crystal formation. These protective effects are likely attributable to the extract's antioxidant and anti-inflammatory properties. (4)

5. Conclusions and recommendations

Urolithiasis is a prevalent urological disease with rising incidence and high recurrence rates globally. Reactive oxygen species and oxidative stress play key roles in stone formation. Dietary polyphenols, natural antioxidants found in plant-based foods and beverages, have garnered

attention for their health benefits, including antiurolithiatic effects. Studies showed the ability to scavenge ROS, regulate oxidative stress-related enzymes, modulate signaling pathways, and preserve cell integrity. It explores the role of oxidative role in urolithiasis, the classification and sources of dietary polyphenols, and their mechanisms in preventing stone formation, while addressing challenges and future directions. Dietary polyphenols show promise for the prevention and management of urolithiasis.

The success of kidney stone prevention depends on the patient's commitment to long-term treatment, including dietary changes, medications, lifestyle adjustments, and personal sacrifices, even without immediate results.

6. Bibliographic references (* of special interest, ** of extraordinary interest)

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