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LETTER TO THE EDITOR

Spontaneous stone passage: is it *Ammi visnaga* effect?

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Abstract *Ammi visnaga* was used in Ancient Egypt as an herbal remedy for renal colic. "Khellin", a chemical obtained from *Ammi visnaga*, was used as a smooth muscle relaxant and has been thought to have pleiotropic effects on urolithiasis. We report a case with multiple ureteral stone passages possibly as a result of medication with an herb preparation, Khellin.

Keywords *Ammi visnaga* · Khellin · Multiple ureteral stones

Introduction

The lifetime risk of urinary stone disease (urolithiasis) is estimated to be between 5 and 12 % in Europe and the USA. Although patients with urolithiasis might be asymptomatic, many have pain and thus commonly present to emergency department [1].

Ammi visnaga is a species of flowering plant in the carrot family known by many common names, including bisnaga, toothpickweed, and khella. It is native to Europe, Asia, and North Africa. It was used in Ancient Egypt as an herbal remedy for renal colic. Khellin, a chemical obtained from *Ammi visnaga*, was used as a smooth muscle relaxant and has been thought to have pleiotropic effects on urolithiasis (smooth muscle relaxation, diuresis and the effects on urinary citrate) [2]. Also amiodarone, the anti-arrhythmic drug, and Cromolyn, an asthma drug, are synthetic derivative of Khellin [3]. Here, we present a case with multiple ureteral stone passages possibly as a result of herbal medication, khellin pills.

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Case report

Fifty-two-year old man was admitted to emergency department (ED) with the complaints of right flank pain after taking "*Kellagon*®" pills himself for 3 days. He had a history of nephrolithiasis for about 16 years. In detailed history, he had regular urological follow-up. He speculated that he had multiple stones in his right kidney ranging from 5 to 16 mm. He stated that he started to take khellin pills himself 3 days ago to expel the kidney stones. Before starting medication, he had no pain. He suddenly felt right flank pain 2 h ago before admission. At the time of presentation to the ED, except costovertebral angle tenderness, physical examination of the patient was unremarkable. Urinalysis revealed hematuria. The other laboratory tests including renal functions were normal. Within different level of right ureter, five stones with 3–5 mm in diameter were detected in non-contrast helical computerized tomography (Fig. 1). Pain relief was provided in the emergency department. During the follow-up, spontaneous passages of stones were observed within 3 days. No invasive procedures were performed.

Discussion

The detailed mechanism of action of Khellin, a chemical obtained from the plant "Ammi Visnaga" has not been

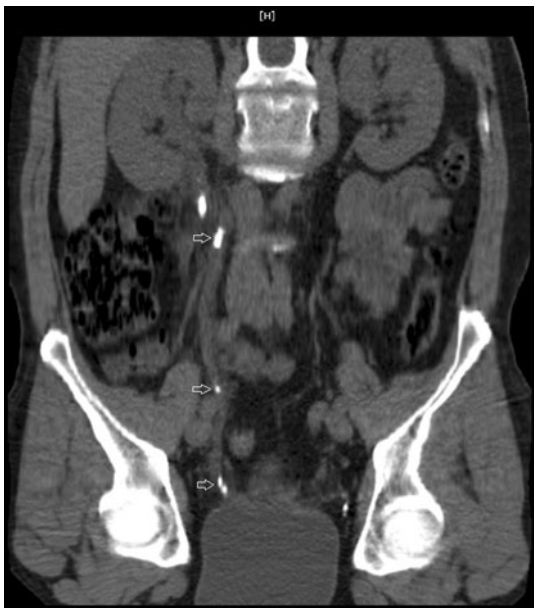

Fig. 1 Multiple ureteral stones (*white arrows*) with 3–5 mm in diameter in right ureter

elucidated yet. Khellin seems to interfere with the citrate metabolism. Since calcium oxalate urinary stones are the most common type of urinary stone (up to 80 %) and citrate is a well-known inhibitor of calcium oxalate (CaOx) crystallization [4]. Khan et al. [5] reported that urinary citrate plays an important role in reducing recurrences of CaOx stones.

A change in systemic pH would alter intracellular pH, resulting in changes in intracellular citrate metabolism, leading to alterations in citrate reabsorption and hence urinary citrate excretion [6]. Vanachayangkul et al. [7] demonstrated that Khellin increased the pH dose dependently along with an increase of urine volume. The plant extract showed a highly potent diuretic activity. The authors therefore speculated that the diuretic activity might be the possible mechanisms of action of khella extract [5]. In our case, spontaneous stone passage may also be due to diuretic activity of the khellin. However, for breaking down the stones, khellin may also have resolving activity.

Medical therapies have been reported to ease urinary-stone passage. Use of α-antagonists and calcium-channel blockers for expulsive medical therapy has been proposed as a way to enhance stone passage [1]. But in most of the patients, the treatment for symptomatic nephrolithiasis in the ED is mainly focused on pain control with narcotic analgesics, but unfortunately medical expulsion therapy is a widely neglectable treatment after discharge of the patient. The availability of such treatment might not be well known by emergency medicine physicians, internists, and family practitioners. Therefore, the knowledge gap in expulsive medical therapy is important for management of nephrolithiasis, especially through the aspect of patients.

Spontaneous ureteral stone passage depends on size and location of the stones [1]. In our cases, although the patient has multiple ureteral stones, the largest stone was 5 mm in size; so that spontaneous passage of the stone was the preferred choice: this approach—provided, that the risks related to surgical intervention be withdrawn.

As a conclusion, although multiple ureteral stones are well-recognized complication of the extracorporeal shock wave lithotripsy (ESWL) therapy, spontaneous multiple ureteral stone passage is a very rare condition. Is this a case of medical lithotripsy? Further investigation will answer this question.

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