TRIAMTERENE BLADDER CALCULUS

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ABSTRACT—A case report of triamterene bladder calculus is presented. Triamterene containing antihypertensives should be used with caution in patients with predisposition to form stones.

Triamterene is a commonly used potassium-sparing natriuretic used alone (Dyrenium) or in combination with hydrochlorothiazide (Dyazide) to treat hypertension. Triamterene and its metabolites are excreted in the urine. Triamterene can be a cause of urolithiasis with an estimated incidence of 0.5 cases per 1,000 persons taking the medication.[1] Reported is a case of a bladder calculus in a Dyazide user. Stone analysis revealed a nidus of triamterene and its two major metabolites. The patient had continued symptoms of prostatism with elevated post-void residuals after cystolitholapaxy. Incomplete emptying may have been a factor in the formation of his bladder calculus. Despite the rarity of triamterene urolithiasis, it is recommended that Diazide users who may be at risk for stone formation be screened periodically with an abdominal roentgenogram and urinalysis.

Case Report

A sixty-five-year-old white man presented with a five-month history of intermittent discomfort in the right and left lower abdominal quadrants which was not associated with voiding. There was a history of intermittency, decreased force of stream, and nocturia twice nightly. There was no past history of urinary tract infection, hematuria, or urolithiasis. He had a twenty-five-year history of hypertension and was taking hydralazine hydrochloride (Apresoline), 15 mg PO q day, metoprolol tartrate (Lopressor), 15 mg PO q day, and Diazide 1 PO q day. Urinalysis was acellular, and excretory urogram showed normal upper urinary tracts; the calcification was in the bladder (Fig. 1). The patient underwent cystolitholapaxy of a large, multifaceted bladder stone. Stone analysis was performed with 4.1 g of stone analyzed. It was composed of calcium oxalate monohydrate and uric acid surrounding a nidus of triamterene and its two major metabolites, parahydroxytriamterene and parahydroxytriamterene sulfate. The nidus of triamterene represented 20 per cent of the total stone weight. On subsequent follow-up, obstructive voiding symptoms persisted as did elevated post-void residuals. Transurethral resection of the prostate was performed with an unremarkable postoperative course. The patient's blood pressure has been managed without triamterene since his cystolitholapaxy and has had no further problems.

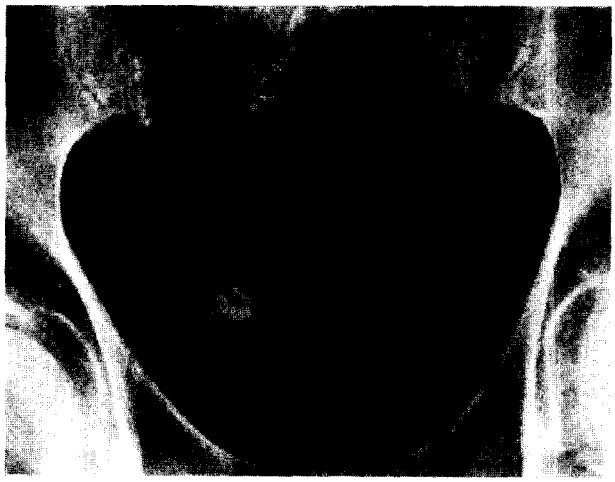

FIGURE 1. *Supine plain film of pelvis showing calcific shadow near right bladder wall, and confirmed as large bladder calculus at cystoscopy.*

Comment

Triamterene is a diuretic which exerts its effect on the distal renal tubule to inhibit the reabsorption of sodium in exchange for potassium and hydrogen ions. It is, therefore, a potassium-sparing natriuretic. It is most commonly prescribed in combination with hydrochlorothiazide. Triamterene is rapidly metabolized to parahydroxytriamterene and then to parahydroxytriamterene sulfate. It is excreted in both bile and urine with urinary metabolites in much higher concentration than the parent compound. The t½ for triamterene is one and one-half to two and one-half hours with urinary excretion diminishing within six to eight hours.[2]

According to Louis C. Herring & Co., based on their extensive stone analysis experience, approximately 1,450 stones containing some triamterene are being passed each year in the nation.[1] It was also estimated that there are 3 million people taking triamterene in one form or another giving an annual triamterene stone incidence of 0.5 per 1,000 persons taking the drug. The Herring Co. found 436 cases of triamterene urolithiasis in the eighteen-month period following the initial case report of triamterene-induced nephrolithiasis in 1979.[3] Though increased dosage of triamterene may be related to stone formation, many cases have been found on a dosage of only one Diazide per day (50 mg of triamterene). Triamterene stones are gold-mustard colored, can be smooth surfaced but irregular in shape. If broken, they may show concentric lamellae. Triamterene also may be found in combination with calcium oxalate monohydrate and uric acid. It is almost never associated with calcium phosphate or magnesium ammonium phosphate.[1] Some investigators believe triamterene and its metabolites may catalyze calcium oxalate stone formation.[4] There is no evidence, however, that the incidence of calcium oxalate stones is higher in triamterene users.

The actual risk of stone formation while on triamterene therapy is unknown. As mentioned, it has been estimated there is an incidence of 0.5 stones per 1,000 persons taking Dyazide. Frequency of urolithiasis in the United States has been estimated at 16.4 stones per 10,000 population which would be greater than the incidence of triamterene stone formation in patients taking the medication.[5] Nevertheless, it would seem prudent to recommend that those patients who are at risk for stone formation be screened at least once if they have been on chronic triamterene therapy. A simple abdominal plain film and urinalysis would seem to be appropriate. We believe our patient was at risk for bladder stone formation because of urinary stasis associated with his prostatism and high post-void residual. Patients with the diagnosis of triamterene stone formation, once stone free, should be cured by discontinuing the medication.

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