



Case Report

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Coexistence of Hip Heterotopic Ossification and Hydronephrosis due to Ureteral Stone in a Patient with Left Hemiplegia



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Abstract

Pain, heat, and swelling in the anterior aspect of a hip due to Heterotopic Ossification (HO) occurred in a case of right intracranial hemorrhage with left hemiplegia. While examining the HO by bone scan, the increase of tracer uptaken in the left kidney was accidentally found. This was later confirmed by computer tomography as ipsilateral hydronephrosis due to ureteral stone impaction. In this case, the ureteral calculus might be asymptomatic or symptomatic but masked by the symptom of hip HO or paresthesia. The bone scan and computer tomography can help in detecting hidden ureteral calculus in patients with hemiplegia and symptomatic hip HO. The generation of HO and ureteral calculus share common risk factors in people with hemiplegia. The coexistence of ureteral stone and HO on the same side of hemiplegia has not been reported before and may occur by chance or with association.

Keywords: Ureteral calculus; Asymptomatic; Hydronephrosis; Hemiplegia; Heterotopic ossification

Introduction

Heterotopic Ossification (HO) is the formation of normal bone within the soft tissue surrounding a joint, which is usually seen with Central Nervous System (CNS) injury, burn, or direct musculoskeletal trauma [1,2]. The HO mostly occurred in hips, followed by shoulders, elbows and knees [3]. The hip HO is usually found in the anterior of hip joint [4]. The HO in post-stroke hemiplegics is rare with an incidence rate of 0.5-1.2 percent, which mostly occurs on the paretic limb [1]. Clinical symptoms of HO can be noticed 3-12 weeks after the precipitating event [2]. Early symptoms are not specific, including pain, fever, swelling, erythema, and decreased joint mobility [2]. In the late stage, ankylosis of the joint may occur [2].

Nephrolithiasis has prevalence of 5 percent to 10 percent in Western countries; it usually presents with acute colic on flank, abdomen, back, and groin when a stone is obstructing or passing through the ureter [5,6]. Other symptoms include emesis, nausea, dysuria, hematuria, urinary frequency, lethargy, urinary

tract infection, fever, and headache from hypertension and anuria [5]. Asymptomatic ureteral calculus has been reported as low as 16 percent [7]. In stroke patients who are bedridden, the common risk factors for calculi formation include urinary tract infections and immobilization [8]. To our knowledge, the concurrence of nephrolithiasis among hemiplegics with HO has not been reported yet.

Case Report

A 53-year-old, bed-ridden, male with the left hemiplegia, paresthesia and speech impairment due to hemorrhage in right basal ganglionic-subinsular-frontal lobe presented with inflammatory symptom of left anterior hip at 7 weeks post-stroke in August 2011. A calcified lesion on left hip was showed by x-ray image, which was confirmed by bone scan as HO. Meanwhile, the significant tracer uptaken on as left kidney parenchyma, renal pelvis and ureter (Figure 1) was noted on bone scan, which was further confirmed as remarked hydronephrosis (12.55 cm)

together with a calculus (1.3 cm) on the left upper one-third of ureter (Figure 2) by CT. The laboratory examinations were not remarkable, except microhematuria and mild elevation of

alkaline phosphatase (154U/L) which decreased soon (103 U/L) at follow-up. Otherwise, C-reactive protein, Blood Urea Nitrogen (BUN), creatinine, albumin, and total calcium were all normal.

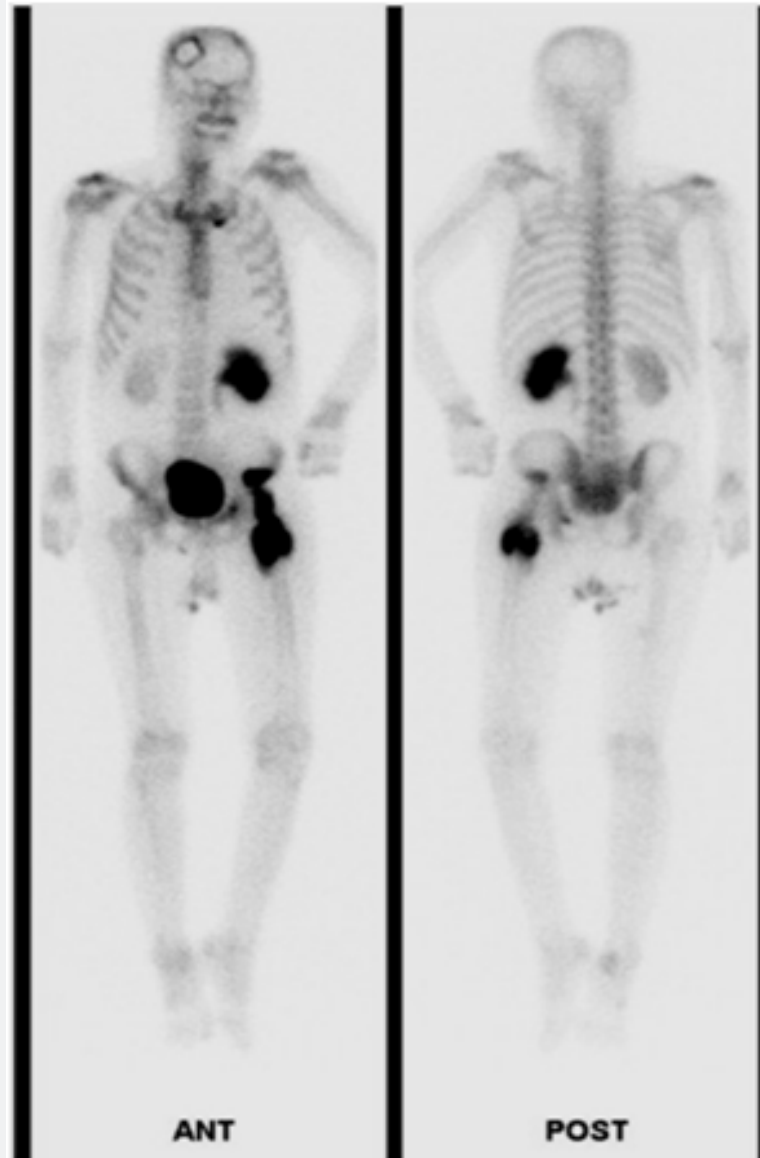


Figure 1: The images of whole body scintigraphy. Remarkable increased uptake of the left hip joint and proximal femur and significantly delayed tracer excretion of the left kidney, pelvis, and ureter after 4 hours on the whole body bone scan. ANT: anterior; POST: posterior.

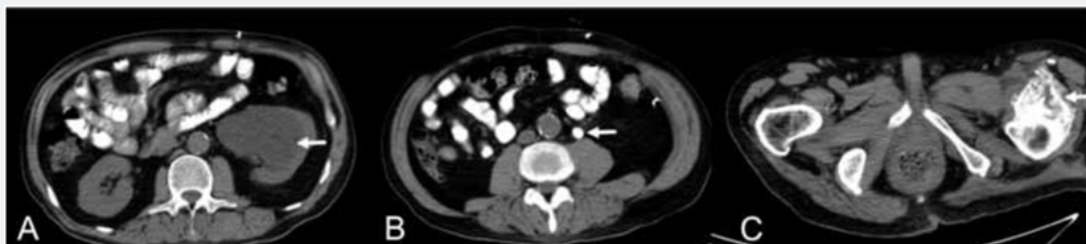


Figure 2: The abdominal CT images. A Marked hydronephrosis of the left kidney, B Calculus (size: 1.3 cm) impaction at left upper one-third of ureter, C Massive calcification at anterior aspect of left hip.

Discussion

When the unexpected increase of tracer uptaken in the left kidney was seen in the patient with HO on the left hip, the ectopic ossification at or adjacent to the kidney was a concern [9]. The concern was easily clarified by CT image with massive calcification on the anterior aspect of left hip but no calcification on left kidney. Most patients having ureteral stones present with colic, while asymptomatic ureteral calculi are not common [6,7]. Ureteral calculi are conventionally diagnosed by Computer Tomography (CT), x-ray, or sonography with the sensitivity at approximately 96 percent, 45-58 percent and 24 percent [10]. Asymptomatic ureteral calculi usually were found incidentally, and nearly one-third were found by examination other than urological x-ray [5,10]. For example, the bone scan provides the clue of ureteral obstruction [9]. When the asymptomatic ureteral calculi were uncovered, hydronephrosis (25 percent) or microscopic hematuria (20 percent) often presented at the same time [5].

It has been reported that in people with Spinal Cord Injury (SCI) that had paresthesia on the flank, abdomen, or groin had vague symptoms of colic, and the calculi were found occasionally with hydronephrosis [6]. Our case with hemiplegia shared a similar clinical picture as cases with SCI, because of hypoesthesia in the left limbs. According to the evidence of persistent microhematuria since stroke, our patient may have had asymptomatic ureteral stones before or as early as becoming left hemiplegia; but a symptomatic ureteral stone with the colic masked by the paresthesia due to stroke or the inflammatory symptom of hip HO was more likely. The diagnosis was even more difficult when the serum BUN and creatinine were not affected by the unilateral ureteral obstruction. Eventually the ureteral calculus was found with remarked hydronephrosis by bone scan and CT. The relationship between urinary calculi and stroke is of interest.

A population-based follow-up study showed there is an increased risk of stroke during the first 5 years after a diagnosis of Urinary calculi [11]. Another two big cohort studies confirmed a strong positive relationship between them, and demonstrated that patients, particularly women and the younger population, with nephrolithiasis have an increased risk of ischemic stroke development [12,13]. However, it was hard to us to tell the relation between cause and effect in our case. Both the formation of HO and ureteral stone have been associated with immobilization, the common sequela of stroke [1,2,8]. The shared contributing factors for HO and urinary calculi formation include post CNS injury, prolonged immobilization, hypercalcemia, disequilibrium of parathyroid hormone and calcitonin [2,8]. However, the concurrence of the ureteral stone and HO on the same side (left side) of hemiplegia has not been reported before. The hip HO is known for occurring mostly on the paretic limb of stoke patients [1]. Another study found that

two-thirds of asymptomatic proximal ureteral stones were on the left side [5]. These reasons or chance alone may cause the phenomenon of left side preference of ureteral stone and HO in this left hemiplegic patient.

Conclusion

Many clinical conditions might co-exist in post-stroke patients, for instance, the ureteral stone and HO. Properly and timely use of diagnostic tools, like bone scan, has merit in differential diagnosis in stroke cases. Further study may be needed to determine the possibility of the coexistence of ureteral stone and HO in the same side of hemiplegia.

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