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Retrocaval Ureter with Ureterolithiasis

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A case of retrocaval ureter with ureterolithiasis is presented with discussion of these clinical entities. An excretory urography, retrograde pyelography and computed tomography pronounced marked hydronephrosis with cortical atrophy and "S"-shaped appearance of the right ureter with ureterolith. Nephrectomy and partial ureterectomy were subsequently performed. (Ajou Med J 1997; 2(2): 136~138)

Key Words: *Retrocaval ureter, Ureterolithiasis*

INTRODUCTION

Retrocaval ureter is an uncommon venous anomaly in which the right ureter courses posterior to the inferior vena cava and partially encircles it[1,2]. It results from persistence of the posterior cardinal venous system that anomalously forms the inferior vena cava, and subsequently courses anterior to the ureter for a variable distances. Varying degrees of ureteral obstruction result from retrocaval ureter and surgical intervention is often necessary. Mostly of the patients remain asymtomatic, however, infrequently there is pain, hematuria or urinary infection[3]. Rarely, stone may complicate the obstruction[4]. Nephrectomy is seldom used as an initial operation because of its usually slow development of hydronephrosis with an appearance of symptoms before the kidney is totally destroyed[1]. We report herein a case of retrocaval ureter with ureterolithiasis.

CASE

A 39-year-old man with a chief complaint of right flank discomfort in the preceding several years was presented. He didn't complain fever, chills, nausea or vomitting. There was no history of prior surgery or renal stone. Physical examination revealed nontender palpable mass on right upper quadrant with length and diameter 10 and 8 cm, respectively. Results of blood test and urinalysis were normal.

An excretory urography showed not-visualized right kidney and calcific density of area 1.7×0.8 cm on L4 vertebral body level. The left kidney was of normal size and showed good excretion of the contrast medium (Fig. 1). The retrograde pyelography showed a tortous ureter

Fig. 1. IVP shows not-visualized right kidney and 1.7 x 0.8 cm sized calcific density on L4 vertebral body level.

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Fig. 2. Retrograde pyelography shows a tortous ureter having an elongated "S" shape and a filling defect to suggest ureterolithiasis at level of L4.

having an elongated "S" shape beginnig just above the pelvic brim and ending below the renal pelvis. A filling defect to suggest ureterolithiasis was noted at the level of L4 (Fig. 2). A CT scan of the abdomen showed marked hydronephrosis with cortical atrophy, a dilated proximal ureter, and the ureter passing posterior to the inferior vena cava (Fig. 3). The ureterolith was detected posterior to the inferior vena cava (Fig. 4).

During the operation it was observed that the right renal pelvis was markedly dilated, and that right upper ureter was dilated, and traced downward and medially, and dipping behind the inferior vena cava. The ureterolith was located just behind the inferior vena cava. Thus, the right ureter surrounding the vena cava was dissected, and right nephrectomy and partial ureterectomy was performed including ureterolith. The patient has been well up to present (3 years postoperatively) without any serious urologic problems.

DISCUSSION

Retrocaval ureter is a rare congenital anomaly that

Fig. 3. CT scan shows marked hydronephrosis with cortical atrophy and a dilated proximal ureter which passed posterior to inferior vena cava.

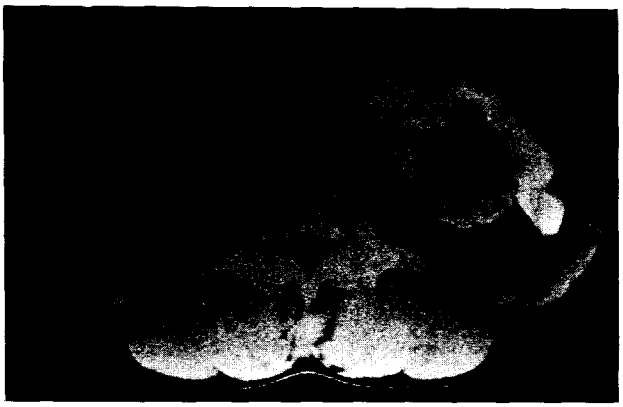

Fig. 4. CT scan shows a ureterolith posterior to inferior vena cava.

occurs in patients almost exclusively on the right side. The usual cause is a persistence of the fetal posterior cardinal vein, although several other anomalous venous arrangement have been described such as double vena cava and bilateral vena cava[5]. The incidence of the condition is greater in male than in female subjects (2.8 : 1) although there is no clear anatomic or embryologic explanation[1]. Since 1893, when Hohstetter first described this condition, more than 200 cases have been reported.

Several classifications for the retrocaval ureter have been formulated. Based on the radiological appearances or on the lumbar level at which the ureter passes behind the inferior vena cava, the retrocaval ureters are divided into 2 groups[3,6]. Type I (long loop) retrocaval ureter has marked medial deviation of the ureter with a "S" or reversed "J" appearance, and it usually produces severe

hydronephrosis. Type II (high loop) retrocaval ureter has slight medial deviation of the ureter with a sickle-shaped curve and it is associated with milder hydronephrosis. Our patient can be categorized as type I retrocaval ureter with "S"-shaped configuration revealed by retrograde pyelography. Type I is more commonly seen clinically, probably because patients are symptomatic and thus seek medical attention. This may be because the ureter is acutely displaced behind the vena cava and this leads to obstruction. In the majority of patients symptoms are due to the ureteral obstruction, resulting in hydronephrosis. Pain resembles renal colic but is intermittent, dull and aching. Hematuria in varying degrees is present frequently. The resulting hydronephrosis may be occult and be unmasked by unrelated clinical events. Many cases of retrocaval ureter were found incidentally during an excretory urography carried out for unrelated reason.

The diagnosis of retrocaval ureter by excretory urography is well known and reveals a characteristic medial deviation of the proximal ureter at the level of L3 or L4 associated with variable degrees of hydronephrosis. Since medial deviation of the middle third of the right ureter to the level of L3 or L4 may be caused by retroperitoneal fibrosis, a retroperitoneal mass, or retrocaval ureter. Thus, retrograde pyelography, as a further diagnostic procedure, is important and sufficient to disclose typically seen "S" image, i.e., permanant proximity of the ureter to the lower vertebral column. The most efficacious and least invasive method of confirming the diagnosis of retrocaval ureter is CT with intravenous contrast infusion, because the inherent ability of CT is to clearly define three-dimensional relationships of retroperitoneal structures. Ultrasonography has been advocated as an accurate and noninvasive modality with which to follow up the patients with retrocaval ureter for only evidence of increasing hydronephrosis, parenchymal atrophy, renal infection, or nephrolithiasis. However, it may be difficult to diagnose by sonography alone when there is no adequate distention of the proximal and retrocaval segments of the ureter.

Surgical division and transposition of the proximal ureter or pelvis to a position anterior to the inferior vena cava is usually carried out for mild symtomatic patients, whereas nephrectomy may be performed in the cases of advanced hydronephrosis and associated atrophy. Our patient had marked hydronephrosis with cortical atrophy, and the cause of the hydronephrosis was not soly due to pressure exerted by the vena cava on the ureter, but rather due to an ureterolith located at retrocaval portion. For asymtomatic patients with little or no hydronephrosis, surgical treatment is not recommended[2].

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