

Case Report

Image characteristics of computer tomography urography in pelvic lipomatosis

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Received November 16, 2013; Accepted December 21, 2013; Epub January 15, 2014; Published January 30, 2014

Abstract: Pelvic lipomatosis is a rare disease where fat tissue deposition is observed in spaces of the pelvic area. The disease has a wide range of presenting obstruction symptoms varying from lower urinary tract symptoms to bowel symptoms. In this report, we described the clinical findings, classical radiological features and treatment in an elderly male patient with pelvic lipomatosis.

Keywords: Pelvic lipomatosis, urography, computer tomography

Introduction

Pelvic lipomatosis is a rare benign disease characteristic by deposition of mature fat tissue in the pelvic cavity and absence of delimitation by a capsule. This condition was originally described by Engels in 1959 [1] and was induced the term "pelvic lipomatosis" to define a clinical-radiologic entity by Fogg and Smyth in 1968 [2]. Mixed inflammatory reactions are often observed, causing compression of the urinary tract such as bladder and ureters, rectum and blood vessels. The patients progressively develop obstructive hydronephrosis, and 40% of them deteriorate into renal failure after an average period of 5 years [3, 4]. It has been demonstrated that approximately 75% of patients with pelvic lipomatosis suffered the diseases of cystitis glandularis, cystitis cystica, or cystitis follicularis as well [5]. Pelvic lipomatosis occurs mostly in men and individuals with dark-skin, however, its etiology has not been established. Computer tomography (CT) scans are considered to be the most effective and essential form of examination. In this report, it is described a case with pelvic lipomatosis and the important role of imaging in the diagnosis of this disease.

Case report

A 76-year-old man, born in Shanghai, complained bilateral waist soreness, constipation

and urgency of urination for more than one year, with progressive worsening in the last three months, without any gross hematuria, remarkable pain and irradiation. The patient had hypertension for years and his hypertension had been under control by nifedipine.

In physical examination, the patient was 1.75 m tall, 85 kg in weight, 27.7 at the body mass index. Abdominal subcutaneous fat thicker was observed and the prostate's location was found elevated at digital rectal examination.

Laboratory examination showed that microscopic hematuria with 16 red blood cells/high power (HP) but no white blood cells. Fasting blood sugar was 5.8 mmol/L and urine sugar was negative. In renal function test, serum creatinine was 240 $\mu\text{mol/L}$ (arrange of normal level, 53-130 $\mu\text{mol/L}$).

In radiology investigation, ultrasonography demonstrated bilateral severe hydronephrosis and ureteral dilatation. The sites of obstruction appeared on both vesicoureteral junctions. The patient underwent a computer tomography (CT) urography. The urography yields better diagnostic information than intravenous urogram (IVU) in pelvic lipomatosis, due to its inherent superior anatomic delineation and contrast sensitivity. It demonstrated excessive fat deposition occupied the pelvis from the bottom of the pelvic cavity, which was characterized with

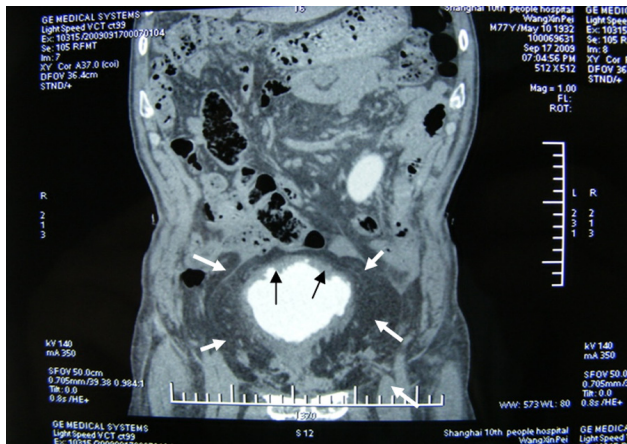


Figure 1. In CT urography, the contrast appeared in the dilated renal pelvic and irregular thickening of bladder mucosa (thin arrows), and negative background around bottom of the pelvic cavity (thick arrows) and indicating that excessive fat tissue deposition occupied the pelvis and compressed the bladder.



Figure 2. Enhanced pelvic CT demonstrated that extra fat tissues (thick arrows) compressed the bladder (thin arrows), rectum and sigmoid colon (a long arrow).

increased fat intensities on enhanced CT of pelvic (<100 HU), causing extrinsic compression and elevation of the bladder with protruding deformation (**Figures 1, 2**). Besides, the occupation of the prostatic compartment compressed the bladder, rectum and sigmoid colon causing deformity and elevation of the bladder floor which looked like “reversed-pear-shaped bladder” (**Figure 3**). CT urography also confirmed the presence of bilateral hydronephrosis

because of the narrowed lumen even obstruction of distal ureters in nephrographic and excretory phases (**Figure 4**).

Under formal rigid cystoscopy, it was difficult to pass into the bladder because of the elongation of the prostatic urethra and the elevation of the bladder neck. It showed obviously proliferative cystitis in the trigone and no tumor or mass was found in the bladder. Bilateral ureteral orifices cannot be identified clearly. The tissue biopsy of the bladder demonstrated cystitis glandularis (**Figure 5**).

The patient underwent exploratory laparotomy and ureteral re-implantation in order to remove the perivesical fatty and to relieve the obstruction on bilateral vesicoureteral junctions. During operation, the heavy adhesion to the umbilicus region and severe inflammation were around renal pelvic and the dome of bladder. Both ureters were grossly distended, and distally they were encased in a mass of fatty fibro tissue in the pelvic which appeared to be obstructing the vesicoureteral junctions. The process of the operation was much difficulty due to extra fatty tissue, especially in the dissection of adhesions of the upper and middle portions of both ureters. Bilateral double “J” stents were detained in the ureter within three months (**Figure 6**). The patient recovered well following the operation and his renal function serum creatine declined to 130 umol/L.

Discussion

Pelvic lipomatosis is a benign overgrowth of adipose tissue with small amount of inflammatory and fibrotic components found especially in the perivesical and perirectal spaces. It was previously reported to be of low incidence which was 0.6-1.7 per 100,000 hospital admissions in USA [6]. Peak incidence of this disease is between 25 to 60 years of age with a staggering male predominance of 10:1, and this disease is commonly noted in African Americans. Clinical features are due to varied compression phenomenon over the urinary tract (lower urinary tract symptoms), rectum (constipation, tenesmus, bleeding), vascular system (edema, lower extremities).

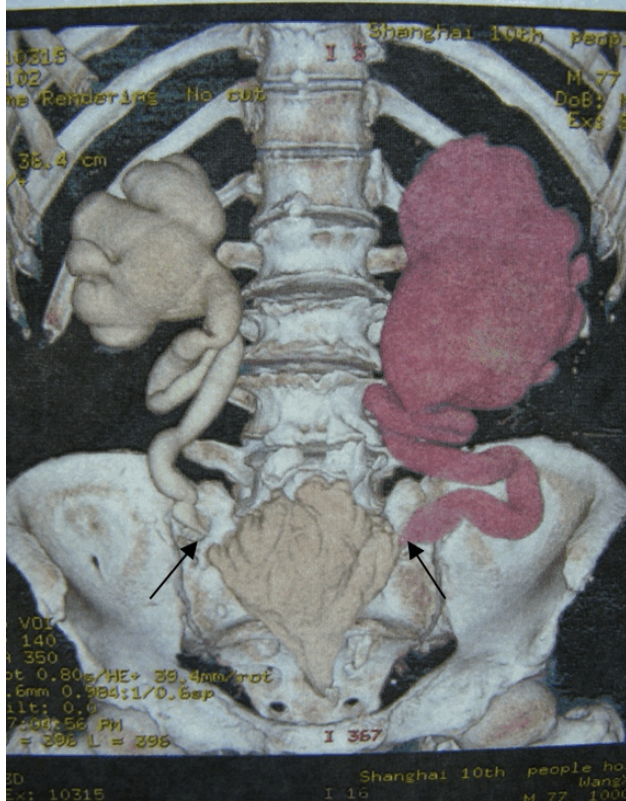


Figure 3. CT Urography reconstruction showed 3D image of “reversed-pear-shaped bladder”, bilaterally-obstructed vesicoureteral junction (arrows), severe dilated ureters and hydronephrosis.

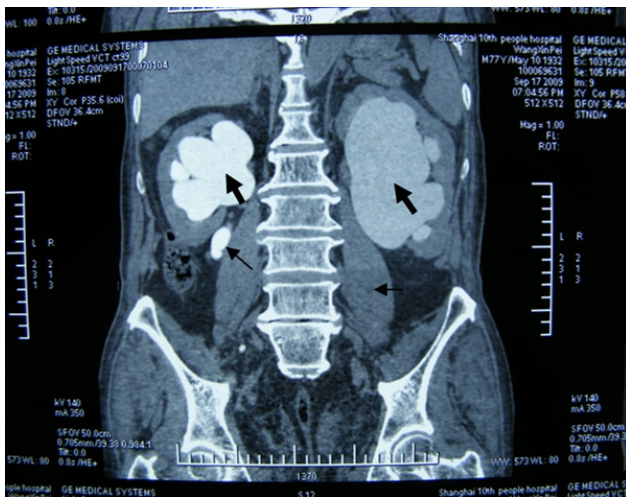


Figure 4. CT urogram upright coronal plane displayed that bilateral severe hydronephrosis (thick arrows) and ureteral dilatation (thin arrows) in excretory phases of IVU.

Certain studies suggest that the etiology is possibly related to obesity but not related with diabetics. But some researches indicated that obesity was not the single factor responsible

for the pathogenesis and the narrow male bony pelvis may also contribute to its currency and development [9]. Some authors also have raised the hypothesis of a response to repeated urological infections, attributing the origin of the fatty tissue deposition to the inflammatory process [7].

The best definitive diagnostic procedure is CT [8] despite of many x-ray or ultra image methods using in urinary tract system. CT images demonstrate deposition of fatty tissues causing compression of adjacent structures, possibly resulting in relevant morphological deformities. It is important to highlight the relevant role of CT urography in the demonstration of the typical presentation of pear-shaped bladder, which is generally accepted as a valuable characteristic indicative of pelvic lipomatosis [9], besides hydronephrosis due vesicoureteral obstruction. It is proposed that the optimal method to increase sensitivity to predict pelvic lipomatosis, especially in the patients with early stage, is based on a quantitative measurement of volume of pelvic fat. This requires a three dimensional imaging data and a precisely designed mathematical model [10].

In the management of this disease, most urologists will generally adopt a conservative approach with the use of symptomatic therapy and follow up for cases with minor symptoms and no renal impairment. Certain modalities of treatment have been employed with little success and these include long term antibiotics, steroids, diet control and even radiotherapy. Occasionally, an upper tract urinary diversion is required for those with obstructive uropathy with worsening renal function and severe symptoms. It has been well described that excision of the pelvic fat is difficult and time consuming but not impossible and response to surgery is good, but recurrence is possible [11]. Ultrasonic assisted lipectomy and re-implantation of ureters have been employed successfully in cases of obstructive pelvic lipomatosis [12].

Conclusion

This rare case of pelvic lipomatosis revealed classical CTU images which have been shown

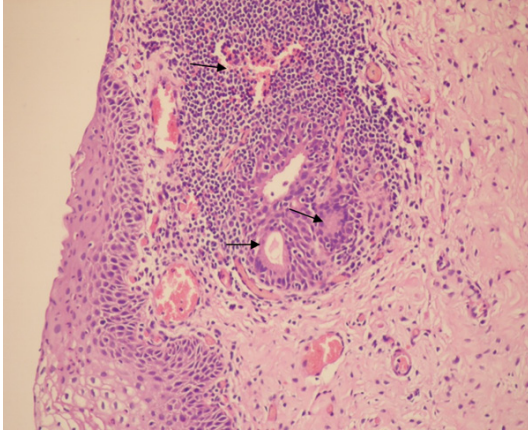


Figure 5. Tissue biopsy of the bladder wall demonstrated cystitis glandularis (arrow) and thick bladder muscle layers.

above. Imaging characteristics can help predict diagnosis and specifically appreciate the progression of pelvic lipomatosis. Despite the benign nature of this disease, close follow up and early intervention is recommended because of the possibilities of future obstructive uropathy, its association with proliferative cystitis and the propensity for recurrence of disease.

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Figure 6. KUB plain film showed that bilateral double "J" ureter catheters were placed in both renal pelvic (thin arrows) and bladder lumens (thick arrows) one week after operation.

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