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RESEARCH ARTICLE

UTILITY OF ADENOSINE DEAMINASE (ADA) AND RADIOLOGICAL MODALITIES IN EARLY DIAGNOSIS AND MANAGEMENT OF RENAL TUBERCULOSIS WITH DIABETES MELLITUS AND HYPERTENSION A CASE REPORT

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ABSTRACT

Renal TB can lead to end-stage renal disease if not diagnosed early and treated correctly. The detection of tuberculosis infection early in life either as primary pulmonary manifestation or as an extra-pulmonary manifestation gives an important clue in a large number of cases and one has to rely on diagnostic approaches like ADA and radiological modalities. The diagnosis in our case was possible because the pleural fluid ADA and radiological injuries were compatible, despite cultures being negative.

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INTRODUCTION

The difficulty in diagnosing extra-pulmonary tuberculosis can be attributed to the poor access of disseminated lesions, the fact of patients being usually paucibacillary (very often causing a negative smear), histopathologic findings are not pathognomonic (granulomatous reaction can be found in other diseases) and there are lower rates of bacteriological positivity (only in a quarter of the cases).The diagnosis of renal TB can be hypothesized in the setting of non-specific bacterial cystitis associated with a therapeutic failure or a urinalysis with a persistent leukocyturia and absence of bacteriuria.

MATERIALS AND METHODS

Following the patient's consent, we reported this case of renal TB with past history of pulmonary TB and Diabetes. A 60-year-old female was admitted to the emergency room of J.J.Group of Hospitals, Mumbai with symptoms of pain in flank since 6 months. She developed pain in lumbar region, which was gradual in onset, dull ache in nature. Patient was investigated thoroughly for renal lump by doing Chest X ray, lumbar-spine X ray, ECG, routine blood chemistry, serological tests and hematology. For lung abscess patient was advised AFB c/s and Urine for AFB and TB-PCR.CECT abdomen +pelvis was done. Urine analysis was done. The patient was found to be diabetic (Blood glucose-281mg %) and hypertensive 160 /100 mmHg. Urine analysis demonstrated urinary pH 6.0; leucocytes 1+; protein 2+; sugar 3+, erythrocytes-nil; uncountable leukocyte casts and negative culture of the urine for pyogenic agents. The patient showed negative serologies (Anti-HBc, HBsAg, anti-HCV, VDRL and anti-HIV) and hematological parameters were hemoglobin 4.6g/dL; hematocrit 14.5%; white blood count 1140/mm3. Heterogeneously enhancing irregular lesion is seen involving lower pole of Right kidney with shaggy perirenal fat stranding. The area is communicating with the pelvicalyceal system. The kidney shows delayed enhancment and excretion suggesting compromised function. . Left lower lung abscess with calcific granulomas in the lung and liver are also seen. Decreased serum albumin levels indicated albuminuria. Significant increase in pleural Adenosine deaminase (ADA-60mg %), guided the patient for starting AKT although urine for AFB came negative. During the follow-up, renal and pleural extra-pulmonary tuberculosis were considered as the main possible diagnosis for the case. The Light's criterion of the pleural fluid was compatible with exudate and Adenosine Deaminase of 60 U/L, and empiric treatment was initiated with antitubercular drugs adjusted according to the national guidelines for TB. The patient became stable and was discharged with control of her symptoms.

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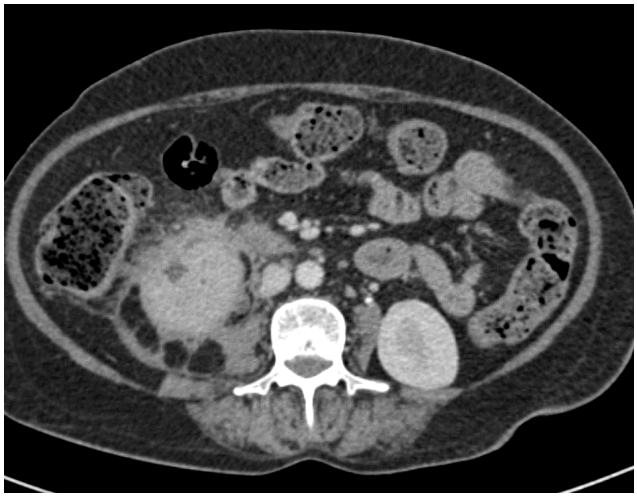

Fig. 1. Axial contrasted image of CT scan showing a complex cyst

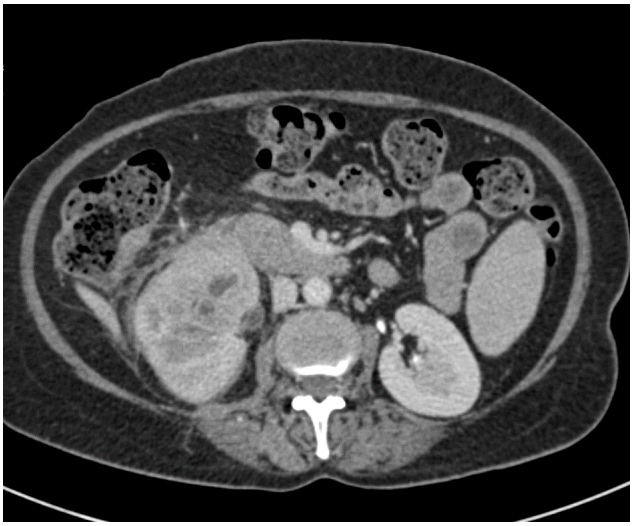

Fig. 2. Axial contrasted image of CT scan showing a complex cyst

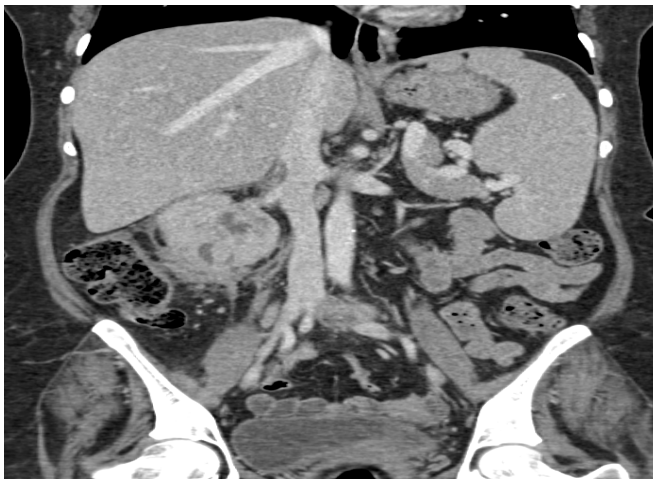

Fig. 3. Coronal contrasted image of CT scan

DISCUSSION

The diagnosis was possible because the ADA pleural fluid and radiological injuries were compatible, despite cultures being negative. Also, the typical sterile pyuria was found and skin tests were strongly positive. The most common laboratory abnormalities are pyuria, albuminuria, and hematuria (Afiune JB et al, 2002).

Seventy five percent of patients have an abnormal chest roentgenogram on admission. Eighty eight percent of patients tested have positive skin tests and sixty three percent tested have abnormal excretory urography. Sixteen percent show renal calcification (Christensen, 1974). The diagnosis of genitourinary TB can be based on culture studies. At least three, but preferably five, consecutive early morning specimens of urine should be cultured on Lowenstein-Jensen medium to isolate M. tuberculosis. The diagnosis of TB on images of the urinary tract depends on the stage of the infection. Tubercular granulomas in the renal pyramids coalesce to form ulcers which discharge mycobacteria and pus in the urine. Untreated lesions enlarge and a tubercular abscess may form in the parenchyma. Later on, perinephric abscess is formed and the kidney is replaced by caseous material ("putty kidney") which may become calcified ("cement kidney") and nonfunctional leading to renal failure (Gibson, 2004). Approximately 75% of renal tuberculosis involvement is unilateral, but in our patient we could find involvement in both kidneys.The collecting system is the most common site of genitourinary TB. In the early stage of urinary TB, few calices are involved and only papillary necrosis or calyceal deformity is depicted on imaging studies. Fibrosis occurring after healing of acute inflammation results in multifocal strictures (Wang, 1997). The most characteristic imaging finding of urinary TB is uneven calyctasis. It is caused by the varying degree of fibrosis and obstruction at various sites. Our case did not show radiological features of papillary necrosis, but a thickening of the ureteral wall to the right, an important caliceal dilation and distortion mainly associated with a left cortical thinning (Figs. 1 and 2).

When the renal pelvis and ureter are affected by TB, hydronephrosis becomes severe. The involved segments show wall thickening and enhancement on CT and MRI. In patients with healed or chronic TB, calcifications may be noted. Renal calcifications are a common manifestation of TB at conventional radiography, occurring in 24% to 44% of patients. In our patient, we were able to see outlying calcifications in both kidneys as is quoted in the literature.[4] Extensive parenchymal calcification in a nonfunctioning, autonephrectomized kidney is characteristic of end-stage TB.
The differential diagnosis for the imaging appearance of renal tuberculosis includes chronic pyelonephritis, papillary necrosis, medullary sponge kidney, caliceal diverticulum, renal cell carcinoma, transitional cell carcinoma, and xanthogranulomatous pyelonephritis. The most valuable radiologic feature of genitourinary TB is the multiplicity of abnormal findings. Whenever a pattern of chronic renal inflammatory disease is recognized, particularly in the setting of periureteric or peripelvic fibrosis, tuberculosis must be considered (Gibson, 2004). Cavitation, the hallmark of post-primary TB, affects about 50% of patients. The cavities typically have thick, irregular walls, which become smooth and thin with successful treatment. Cavities are usually multiple and occur within areas of consolidation. Resolution can result in emphysematous change or scarring. The minority of the cavities demonstrates air-fluid levels; however, these findings can indicate the presence of superinfection (McAdams, 1995). If there is airway disease and, in particular, endobronchial spread of infection, tree-in-bud opacities may develop. These findings, which are usually visible in the lung periphery and resemble a branching tree with buds at the tips of the branches, are indicative of active tuberculosis. Lymphadenopathy and pneumothoraxes are seen in only about 5% of patients

(McAdams, 1995). Airway involvement is characterized by bronchial stenosis, leading to lobar collapse or hyperinflation, obstructive pneumonia, and mucoid impaction. Bronchial stenosis is seen in 10% - 40% of patients with active TB.[5]and is best demonstrated with CT, which usually shows long segment narrowing with irregular wall thickening, luminal obstruction, and extrinsic compression (Curvo-Semedo, 2005). It also results in tree-in-bud opacities and traction bronchiectasis, particularly of the upper lobes. Pleural effusions occur most often in primary TB but are seen in approximately 18% of post-primary cases and they are usually small. High resolution tomographic findings of our patient demonstrated parenchymal bands, traction bronchiectasis with cavities in between, center-lobular emphysema, reduced volume of the upper lobes and extensive left pleural thickening. These findings are consistent with chronic TB and revealed no signs of exacerbation (Burrill, 2007). The patient was managed with antidiabetic therapy, for hypertension and specific pharmacological treatment for TB. The chemotherapy regimen was instituted according to the national guidelines for the treatment of TB. She left the hospital with control of her symptoms to finish treatment during the following months. In summary, renal TB is an important cause of kidney disease, mainly in TB and HIV high burden population and can lead to end-stage renal disease if not diagnosed early and treated correctly.

Conclusion

We reported this case of renal TB with a past history of pulmonary TB. This helped us to draw conclusion that the knowledge of tuberculosis infection early in life either as primary pulmonary manifestation or as an extra-pulmonary manifestation provides an important clue in a large number of cases and one has to rely on diagnostic approaches like ADA and radiological modalities. The diagnosis was possible because the pleural fluid ADA and radiological injuries were compatible, despite cultures being negative.

Conflict of Interest: The authors declare that they have no conflict of interest.

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