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Case Report

Nephrolithiasis as the first presentation of sarcoidosis - A case report

Melina Dimitra Dissanayake, Harsha Sathischandra

National Hospital, Sri Lanka.

Key words: **sarcoidosis, nephrolithiasis, hypercalcemia, HRCT**

Abstract

Corresponding Author: Melina Dimitra Dissanayake, E-mail:< melinadissanayake@gmail.com > https://orcid.org/0000-0002-3131-8244

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Introduction

Hypercalcaemia is seen in 10-20% of patients with sarcoidosis and can result in nephrolithiasis, nephrocalcinosis, granulomatous tubular interstitial nephritis associated with acute renal failure or chronic kidney disease and, rarely, glomerular diseases. Although hypercalcaemia is a known metabolic complication of sarcoidosis, it is rarely a presenting clinical manifestation. Here we report a case of pulmonary sarcoidosis manifesting as nephrolithiasis as the first presentation. This case highlights the importance of considering sarcoidosis as a cause for renal calculi of unknown origin.

Case report

A 52-year-old male presented with left sided colicky abdominal pain with loin to groin radiation associated with haematuria and dysuria for one week. He also complained of intermittent low grade fever with chills associated with loss of appetite and loss of weight (6 kilograms) for a period of 3 months. This was accompanied by left knee joint pain and swelling with multiple small and large joint arthralgia for a similar time period. He did not complain of cough, dyspnoea, chest pain or palpitations. He also denied any skin rashes, dry eyes, dry mouth, parotid swelling or visual changes. There was no exposure to tuberculosis or any significant occupational exposure but he gave a history of unsafe sexual exposure 5 years back. He is an occasional alcohol consumer and had smoked 4 pack years of cigarettes up to date.

Examination revealed a febrile male with a temperature of 37.1 degrees Celsius. There was no conjunctival pallor, red eyes, dry eyes or parotid swelling. He had bilateral non tender and discrete inguinal lymphadenopathy, each measuring less than 1 cm in

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diameter. Other lymph node groups were not palpable. There were no skin rashes. Abdominal examination revealed tenderness over the left lumbar region with no renal angle tenderness. His left knee joint was tender and swollen without evidence of redness or warmth. Other joints did not reveal features of inflammation. Respiratory, cardiovascular and nervous system examinations were unremarkable.

Laboratory investigations are summarized in Table 01: hypercalcaemia and bilateral renal stones complicated with urinary tract infection (UTI) and acute kidney injury (AKI) were the main findings.

Table 01: Laboratory findings on admission

Parameters	Patients' value	Normal range
White blood cells	15.00	4.00-10.00*10^3/uL
Neutrophils	90%	50-70%
Lymphocytes	9%	20-40%
Eosinophils	1.0%	0.5-5 %
Haemoglobin	11.5	11-16 g/dL
Platelets	287	150-450*10^3/uL
Aspartate transaminase	38	<50 U/L
Alanine transaminase	27	<50 U/L
Alkaline phosphatase	87	44-147 IU/L
Gamma glutamyl transferase	21	0-55 IU/L
Albumin	3.1	3.5-5.2 g/dL
Globulin	3.8	2.2-4.0 g/dL
Creatinine	On day 1 - 4.2 On day 7 – 1.1	0.5-1.1 mg/dL
Sodium	134	135-148 mmol/l
Potassium	3.9	3.5-5.1 mmol/L
Serum uric acid	5.7	3.5 – 7.2 mg/dL
C- reactive protein	1.On day 1-150 2.On day 7 - 10	<6 mg/dL
Erythrocyte sedimentation rate	42	mm/hr

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Urinalysis	Pus cells – 30-40/hpf Red cells – field full Protein - Nil Organisms – ++ Eosinophils - nil	
Urine culture	*Escherichia coli* > 10^5 CFU/ml	
Urine protein to creatinine ratio	0.17	<0.2
Serum ionized calcium	7.8	4.4- 5.5 mg/dL
Serum phosphorous	3.3	2.5 – 4.6 mg/dl
Urine calcium to creatinine ratio	0.16	<0.14
1,25-dihydroxyvitamin D level	120	20-76pg/ml
Serum parathyroid hormone level	15.8	18.4 - 80.1 pg/ml
X ray- kidney, ureter and bladder (KUB)	Normal	
Ultra sound (USS) KUB	Multiple bilateral renal stones (largest measuring 0.9x0.8 cm on left and 0.7x0.3 cm on the right kidney respectively) with mild hydronephrosis and evidence of acute kidney injury	
Antinuclear antibody	Negative	

His chest X-ray showed bilateral hilar prominence with reticular nodular shadowing predominantly in the mid zones. (Figure 1) Sputum acid fast bacilli and sputum Gene Expert were negative. Mantoux and HIV 1 & 2 antibodies were also negative. High resolution computed tomography scan of the chest (HRCT) demonstrated irregular perilymphatic micronodules mainly in the mid and upper zones of the lung fields with bilateral hilar lymphadenopathy (Figure 2). Bronchoscopy and trans-bronchial hilar lymph node biopsy demonstrated foci of granulomata and giant cells in the absence of caseous necrosis. Bronchoalveolar lavage was negative for TB by Gene Expert. Serum angiotensin converting enzyme level was high: 54 (8-52 U/L).

With the above investigation findings, a diagnosis of pulmonary sarcoidosis complicated by bilateral renal stones, UTI and AKI was made. He was started on intravenous piperacillin tazobactam and oral tamsulosin. With adequate hydration, a low calcium diet and IV antibiotics he made a good recovery. After liaising with the respiratory team, he was started on oral corticosteroids 1mg/kg daily after completion of seven days of IV antibiotics. Several investigations including lung function tests and 2D echocardiogram were arranged on an outpatient basis and it was planned to review him at the clinic in one months' time.

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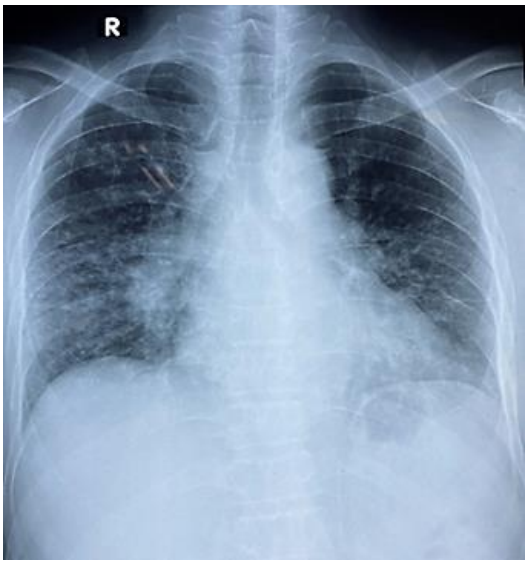

Figure 01: CXR-PA showing bilateral hilar prominence with reticular nodular shadows involving mid zones predominantly.

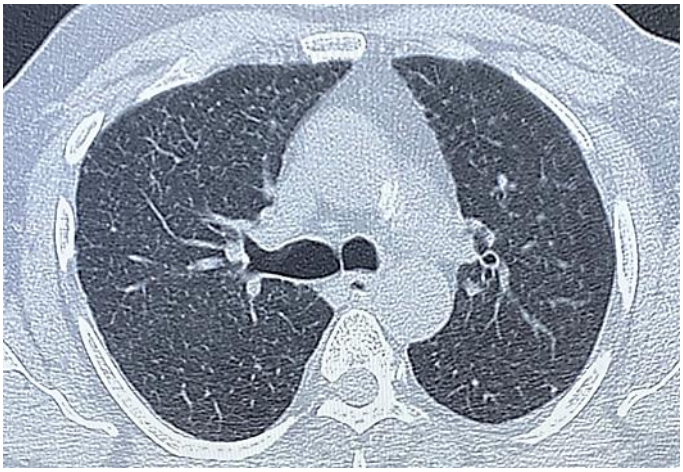

Figure 02: HRCT chest showing irregular micronodules suggestive of sarcoidosis

Discussion

Sarcoidosis is a multisystem, granulomatous, inflammatory disease of unknown aetiology which can involve a wide array of organs. The most common organs involved are the lungs and intrathoracic lymph nodes [1]. It mainly affects 20 to 40 year old people worldwide. Although the lung is involved in more than 90% of cases, only 20-40% of patients present with respiratory symptoms [2]. Majority present with extra pulmonary manifestations and recognition of such extra pulmonary features is of utmost importance for prompt diagnosis and appropriate treatment.

Deranged vitamin D and calcium metabolism leading to hypercalcaemia, nephrolithiasis and nephrocalcinosis are the most common renal manifestations of sarcoidosis. Renal tubular defects, renovascular disease and glomerular disease are also observed [3]. Renal calculi have been reported in around 10% of patients with sarcoidosis [4] but nephrolithiasis as a first presentation of sarcoidosis is uncommon and is rarely reported. Our patient presented with nephrolithiasis secondary to hypercalcemia. A diagnosis of primary hyperparathyroidism was initially considered but low serum PTH level in the presence of normal serum phosphorus made us look for alternative diagnoses.

Although he denied respiratory symptoms, a routine chest X-ray was performed. Bilateral hilar lymphadenopathy with parenchymal changes made us suspect sarcoidosis as the primary diagnosis which was later confirmed via HRCT chest and tissue biopsy. Chest X-ray is abnormal in 86-92% of patients with sarcoidosis [5] even in the absence of respiratory symptoms, therefore it is an important investigation in patients being evaluated for hypercalcemia.

Renal failure can occur secondary to dehydration, hypercalcaemia, hypercalciuria, glomerular nephritis or granulomatous interstitial nephritis in sarcoidosis. It is crucial to diagnose sarcoidosis early and start on disease specific treatment in order to prevent progression to chronic renal failure. Corticosteroids remain the mainstay of treatment along with adequate hydration and a low calcium diet [2]. With early diagnosis and early initiation of corticosteroid therapy our patient made a full recovery of his renal functions.

Conclusion

This case emphasises the importance of considering sarcoidosis as a differential diagnosis in patients with renal calculi of unknown origin. Correct diagnosis and early therapy is essential in order to prevent terminal renal failure in patients with sarcoidosis complicated by nephrolithiasis and AKI.

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