



Case Report

Renal tumor leading to acute respiratory distress syndrome – a rare occurrence

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ABSTRACT: Adult respiratory distress syndrome (ARDS) generally develops in the setting of sepsis, aspiration, shock or some other identifiable cause. Pulmonary involvement with neoplastic disease is an unusual but recognized cause of ARDS and has been rarely reported. Here we report a case of ARDS due to renal tumor most probably renal cell carcinoma (RCC).

KEY WORDS: ARDS; Renal tumor; Adult respiratory distress syndrome

INTRODUCTION

ARDS due to neoplasia is an uncommon presentation. More so it is indistinguishable from ARDS due to other causes. Rarely germ cell tumors and hematological malignancies have been reported to present as ARDS¹⁻⁴. Here we report a first case, to our knowledge, in which ARDS occurred in the setting of renal tumor, most probably renal cell carcinoma associated with metastases to the lungs, and emphasize the importance of considering a neoplastic disorder in the differential diagnosis of cases of otherwise unexplained ARDS.

CASE DETAILS

A 57-year-old Asian male presented with progressive complaints of dyspnea, dry cough and right chest pain for 15 days. He also had history of low-grade fever, pain in the hip and gluteal region along with decreased appetite and history of significant weight loss for past 2 months. He had no past history of diabetes mellitus, hypertension or any other systemic element. On presentation BP was 130/90, PR 126/min, RR 40/min and he was

unable to maintain saturation in spite of high flow oxygen supplementation. General and systemic examination yielded no other abnormality apart from pallor. CXR done showed bilateral infiltrates with normal cardiac size (**Figure 1**). ECG and echocardiography revealed normal cardiological examination. A provisional diagnosis of ARDS due to sepsis, focus probably in the respiratory tract, was made and the patient was later put on mechanical ventilation.

Blood investigations showed mild leukocytosis (TLC 12,740/cu mm). Endotracheal secretion for Gram stain and culture yielded no organism. Urine routine microscopy and culture as well as blood culture were sterile after 48 hours. Serum amylase and lipase was within normal limits. No apparent cause for ARDS was found. X-ray pelvis and CT scan of pelvis were done for evaluation of pain, which showed multiple lytic lesions (**Figure 2**). X-ray of hands showed similar lytic lesions. A diagnosis of multiple myeloma was made. But urinary analysis for Bence Jones (BJ protein and serum electrophoresis both were negative. Serum calcium was normal and bone marrow was suggestive of mild erythroid hyperplasia. CT thorax including abdomen with contrast was done, which revealed a mass involving the right kidney with pleural-based masses in the right hemithorax and bilateral infiltrates suggestive of ARDS (**Figure 3**). A probable diagnosis of ARDS due to renal cell

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carcinoma was made. Meanwhile in spite of mechanical ventilation the patient expired within 72 hours before renal biopsy could be performed and facility of autopsy was not available at our center.

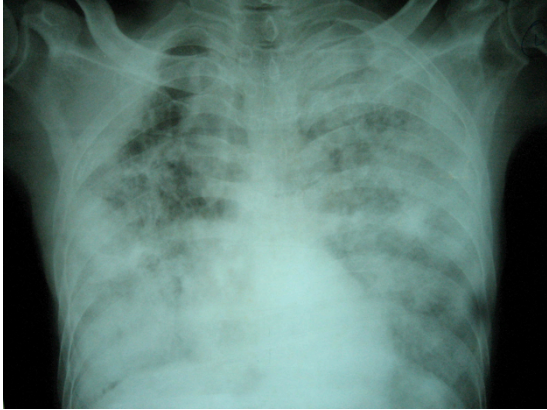


Figure 1: CXR showing bilateral infiltrates with normal cardiac size suggestive of ARDS

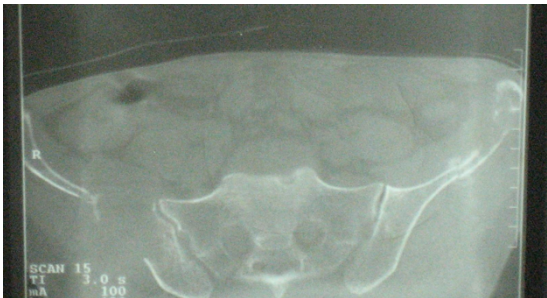


Figure 2: CT scan of pelvis showing multiple lytic lesions



Figure 3: CT abdomen showing a mass involving right kidney

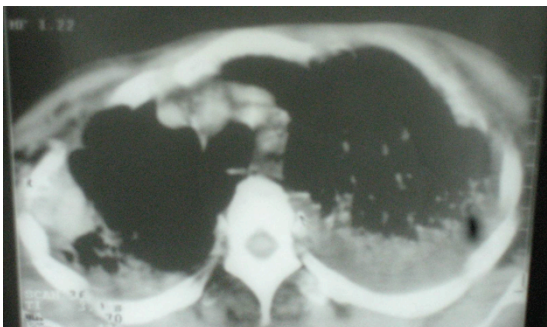


Figure 4: CT thorax showing pleural based masses in right hemithorax

DISCUSSION

ARDS is a syndrome characterized by acute onset (within 7 days), radiologically bilateral opacities on CXR or CT scan, hypoxemia ($\text{PaO}_2/\text{FiO}_2 < 300$) and respiratory failure that cannot be explained by cardiac failure or fluid overload (echocardiography being diagnostic)⁵. ARDS generally develops in the setting of sepsis, aspiration, shock or some other identifiable cause.⁶ In some cases of ARDS, however, the underlying, triggering factor may be obscure.

In our case the patient developed typical features suggestive of ARDS- sudden respiratory distress, CXR showing bilateral infiltrates and arterial hypoxemia refractory to supplemental oxygenation. There was no other etiology to explain the ARDS. Computed tomography showed a mass in the right kidney. 83-90% of solid renal masses thought to be suspicious for RCC based on careful radiographic evaluation prove to be RCC on final pathologic analysis. Indications for per-cutaneous renal biopsy or aspiration in evaluation of renal masses are limited and fine needle aspiration biopsy neither improves the diagnostic certainty nor influences clinical management in majority of cases⁷.

Pulmonary involvement with neoplastic disease is an unusual but recognized cause of ARDS. It has previously been reported in association with metastatic gestational choriocarcinoma, in mycosis fungoides with lung involvement, cases of leukemia, lymphoma, multiple myeloma, angiosarcoma, histiocytosis and adenocarcinoma¹⁻⁴. RCC has been reported to cause several atypical pulmonary manifestations^{8,9}. But ARDS as a manifestation of RCC has never been reported. In a group of patients with ARDS who underwent diagnostic open-lung biopsy, nine of 19 patients with a previous diagnosis of malignancy were found to have diffuse tumor infiltration of their lungs (four cases of leukemia and one case each of lymphoma, angiosarcoma, histiocytosis, adenocarcinoma and choriocarcinoma)¹⁰.

The pathogenesis of widespread alveolar-capillary membrane damage associated with metastatic tumor is speculative. The prime importance of this case is the recognition that although uncommon, metastatic pulmonary tumors can cause a clinical picture of ARDS indistinguishable from other causes. In patients with either an established diagnosis or suggestive findings of a malignant disorder (e.g. lymphadenopathy) diffuse pulmonary tumor infiltration should be considered in the differential diagnosis. Bronchoalveolar lavage and/or transbronchoscopic lung biopsy may be diagnostic. In selected cases, open-lung biopsy may be warranted despite the potential morbidity. The importance of making a specific diagnosis in

ARDS should not be underestimated. Supportive treatment alone is generally ineffective unless the underlying disorder is reversed or controlled.

REFERENCES

1. Gabor EP, Sherwood T, Mercola KE. Intravascular lymphomatosis presenting as adult respiratory distress syndrome. *Am J Hematol.* 1997;56(3):155-60.
2. Kishimoto M, Prasertsuntarasai T, Gelber R, Tanabe A, et al. Diffuse Large B-Cell Lymphoma Manifesting as Acute Respiratory Distress Syndrome. *Am J Med Sci.* 2004;328(6):354-6.
3. McGowan MP, Pratter MR, Nash G. Primary testicular choriocarcinoma with pulmonary metastasis presenting as ARDS. *Chest.* 1990;97(5):1258-9.
4. Marmor DB, Farber JL, Gottlieb JE. Acute respiratory distress syndrome due to pulmonary involvement by neoplastic plasma cells in multiple myeloma. *Thorax.* 2006;61(5):455-6.
5. The ARDS Definition Task Force. Acute respiratory distress syndrome: the Berlin definition. *JAMA.* 2012;307(23):2526-33.
6. Fein AM, Lippmann M, Holtzman H, Eliraz A, et al. The risk factors, incidence, and prognosis of ARDS following septicemia. 1983. *Chest.* 2009;136(5 Suppl):e30.
7. Campbell SC, Novick AC, Bukowski RM. Renal tumours. In Wein AJ, KavonssiLR, Retik AB, et al, eds: *Campbell-Walsh Urology*, 9th edition. Philadelphia, WB Saunders. 2007:1603.
8. Daryanani S, Knausenberger HP, de Takats PG, Guest PJ, et al. Spontaneous pneumothorax associated with expectoration of a lump of metastatic renal cancer. *Clin Oncol (R Coll Radiol).* 1997;9(4):262-3.
9. Jariwalla AG, Seaton A, McCormack RJ, Gibbs A, et al. Intrabronchial metastases from renal carcinoma with recurrent tumor expectoration. *Thorax.* 1981;36(3):179-82.
10. Warner DO, Warner MA, Divertie MB. Open lung biopsy in patients with diffuse pulmonary infiltrates and acute respiratory failure. *Am Rev Respir Dis.* 1988;137(1):90-4.