

Radiology Quiz

Question Page

Clinical History

A 30 year old lady status post renal transplant recipient from a living non-related donor, 6 months later she experienced grand mal seizure with loss of consciousness.

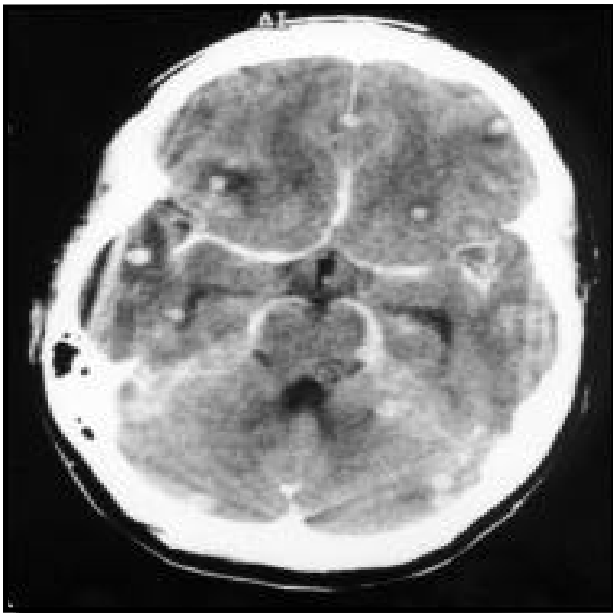


Figure 1 - Post intravenous contrast axial CT at the level of the cerebellum.



Figure 2 - Post intravenous contrast axial CT at the level of the lateral ventricles.

1. What are the radiographic findings?
2. What are the diagnostic possibilities?

FROM THE NEUROLOGY DIVISION
RADIOLOGY & IMAGING DEPARTMENT
RIYADH ARMED FORCES HOSPITAL
RIYADH, KSA

Radiology Quiz

Answer Page



Figure 1 - An enhanced CT scan of the brain obtained at the level of the temporal horns showing enhancing well-defined nodular lesions in the infratentorial and supratentorial areas (Arrows).



Figure 2 - An enhanced CT of the brain at the level of the body of the lateral ventricle showing smoothly ring enhancing lesions at the corticomedullary junction and the cerebral cortex (Arrows).

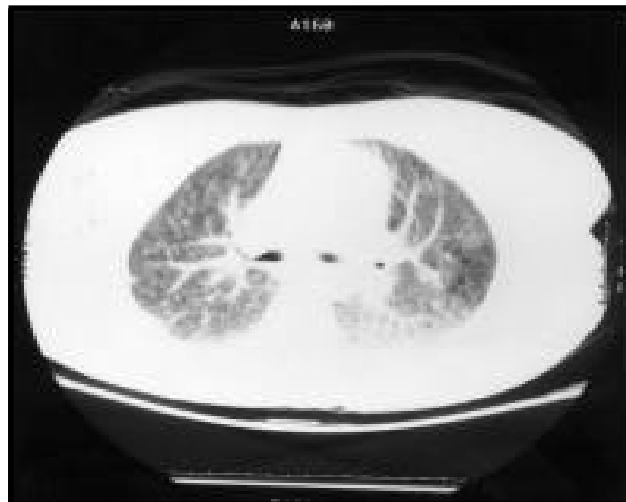


Figure 3 - An axial CT scan of the chest demonstrating multiple pin like miliary lesion in both lungs.

Radiology Quiz

Answer Page (cont)

Findings

The brain computerized tomography (CT) study showed evidence of multiple nodular and ring enhancing lesions, affecting both the infratentorial and supratentorial regions. The outline of these lesions appeared smooth and regular. Minimal surrounding edema is also noted. Note also that some of the lesions are noted at the cortico-medullary junction Figures 1&2. It was also noted that the patient has multiple millitary lesions in both lungs (Figure 3), with no evidence of mediastinal lymphadenopathy.

Radiological diagnosis

In the clinical context of immunosuppression and taking considerations the patient presentation, and the multisystem involvement there is a high possibility of opportunistic infection, tuberculosis (TB) being the most common. The cerebrospinal fluid (CSF) showed findings consistent with TB infection.

Final diagnosis

Millitary disseminated intracranial, and pulmonary tuberculosis.

DISCUSSION. The brain is a frequent site of hematogenous spread via arterial or venous system (Bastons Plexuses), this is also true for metastasis, which are often from lung, breast, thyroid, renal, melanoma, stomach and prostate. Metastasis from sarcoma, leukemia and lymphoma are common in immunocompromised patients. There are a variety of infective causes that can produce a similar reaction such as tuberculosis, nocardia, toxoplasmosis, histoplasmosis, paragonioma, aspergilosis, and multiple abscesses due to bacterial endocarditis and intravenous drug abusers.

Central nervous system TB occurs as a result of hematogenous spread from primary focus, mostly pulmonary TB. Its prevalence in Saudi Arabia is high. Central nervous system involvement is either in the leptomeningitis (diffuse exudative form) or localized for (tuberculoma), the latter are a small foci of tuberculous cerebritis surrounded by subacute or chronic inflammatory reaction.¹ Radiographically the differentiation of ring enhancing tuberculoma from other causes that have similar appearance may be difficult, however there are some signs that may help to distinguish tuberculoma in which the enhancing margins are typically smooth and thin while those caused by tumors are irregular and nodular.

The clinical features of TB are varied and depend on several factors; among them is the immunodeficiency status, malnutrition, genetic factors.^{1,2} Intracranial tuberculoma may be solitary or multiple; the latter is more common.¹ In immunocompromised patients there is an increased predisposition to opportunistic infections and neoplasm, the former might be life threatening. The risk of infection is determined by intensity of exposure to potential pathogens and combined effect of all factors that contribute to the patient's susceptibility to infection e.g. immunosuppressive therapy, underlying immunosuppression. It has been claimed that TB is an important infection in renal transplant recipients³, morbidity from TB following kidney transplant is about 1% and occurs within the first year after transplantation.⁴ There is generally a satisfactory response to antimicrobial therapy, however deaths were reported from uncontrolled infection.⁴

References

1. Imaging of tuberculosis and cerebrospinal tuberculosis. *The Radiologic Clinics of North America* 1995; 33: 753-786.
2. Fishman J, Rubin RH. Infection in organ transplant recipients. *N Eng J Med* 1998; 338: 1741-1751.
3. Hall CM, Wilcox PA, Swanepoel CR. Mycobacterium infection in renal transplant recipients. *Chest* 1994; 106: 435-9.
4. Lioveras J, Peterson PK, Simmons RL. Mycobacterium infection infection in renal transplant recipients. *Arch Intern Med* 1982; 142: 882-92.