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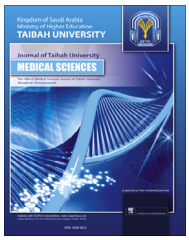

Quiz

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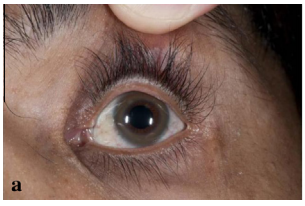
Case history

A 25-year-old man presented with a 4-year history of difficulty in speech and writing, and difficulty in walking for 1 year. He also noticed difficulty in performing manual work for 6 months.

On examination, he had splenomegaly and bilateral gynaecomastia. His speech was low volume, slurred and monotonous, muscle tone was mildly increased, and gait was limping. His eyes and hands photographs are shown in Figure 1.

- What is the most likely diagnosis?
- What are the hallmarks of the disease?
- Describe the underlying etiology?



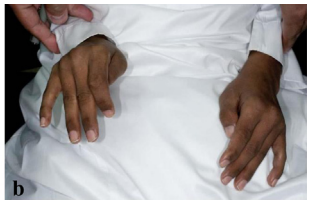


Figure 1:

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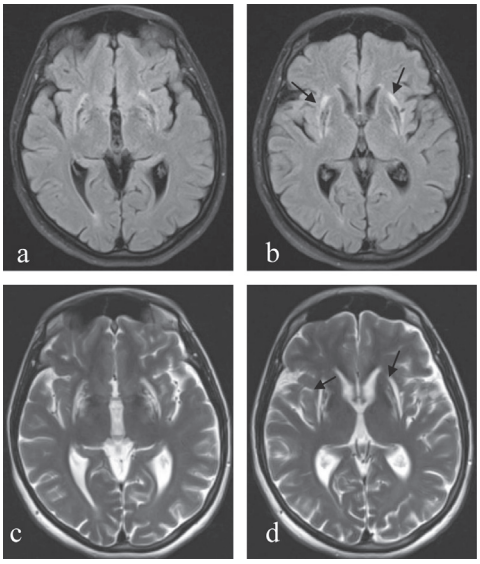

Figure 2: MRI of the brain in a young woman with Wilson disease. It is showing bilateral signal changes involving both lentiform nuclei on FLAIR (a and b) and T2 weighted images (c and d).

Discussion

Figure 1a is demonstrating Kayser–Fleischer ring (deposition of copper in Descemet's membrane). Although Kayser–Fleischer rings are sometimes visible to the naked eye, they are easily detected by slit lamb examination. These rings are seen in about 50% of patients with hepatic manifestations and 98% of patients with neurological manifestations. Figure 1b is showing dystonia of both hands, another manifestation of Wilson disease.

Liver function tests revealed low serum albumin and at 26 g/L (normal range: 35–50 g/L), increased alanine transaminase at 98 U/L (normal range: 35–40 U/L), otherwise unremarkable. Ultrasonogram of hepatobiliary system revealed coarse hepatic tissue echo texture with splenomegaly. Serum ceruloplasmin level was 11.51 mg/dl (normal range: $\geqslant$20 mg/dl). 24 hour urinary copper excretion was 150 microgram per day. Liver biopsy revealed cirrhotic change. The final diagnosis was Wilson disease. Based on history and physical examination, the pyramidal and the extrapyramidal systems (dystonia and lack of coordination of skilled movements) are affected.

Wilson's disease is an autosomal recessive disorder of hepatic copper metabolism resulting in the accumulation of copper in many organs and tissues.[1] The hallmarks of the disease are the presence of liver disease, neuropsychiatric symptoms and Kayser–Fleischer rings on slit-lamp examination of the cornea. Neurological manifestations constitutes the initial clinical presentation in 40–60% of patients with Wilson's disease.[2] These include dysarthria, ataxia, tremor, parkinsonism and abnormal gate.

Magnetic resonance imaging (MRI) abnormalities are seen in almost 100% of Wilson's disease patients with neurological dysfunction.[3] The presence of brain atrophy (Cerebral cortex, bilateral basal ganglia, brain stem, and cerebellum) and high signal intensity in the basal ganglia on T2-weighted images (Figure 2) are perhaps the most widely recognized abnormalities. Other less commonly described abnormalities include the "face of the giant panda" in the midbrain, the "face of the miniature panda" in the pons, and the "bright claustrum" sign.[4] The "face of the giant panda" refers to hyperintensity in the midbrain tegmentum with normally hypointense red nucleus (eyes), preservation of signal intensity of the pars reticulate of the substantia nigra (ears) and low signal intensity of the superior colliculous (chin). The "face of the miniature panda" refers to hypointensity of medial longitudinal fasiculus and central tegmental tract forming the eyes, hyperintensity of aqueduct opening into the fourth ventricle, the nose and mouth and the superior cerebellar peduncle form the panda's cheeks. The "bright claustrum" sign refers to a thin rim of the T2 hyperintense lesion seen in the claustrum.

Wilson disease is an autosomal recessive disorder that leads to impairment of cellular copper transport.[5] It is caused by mutation in the ATP7B gene, located on chromosome 13. ATP7B is a polytopic membrane protein containing several motifs characteristic of P-type ATPases. More than 300 mutations have been identified which made commercial genetic testing for Wilson's disease impractical. Although missense mutations are most frequent, deletions, insertions, nonsense, and splice site mutations all occur. Most affected patients are compound heterozygotes inheriting different mutations from each parent.

References

1. Huster D. Wilson disease. **Best Pract Res Clin Gastroenterol 2010**; 24: 531.
2. Lorincz MT. Neurologic Wilson's disease. **Ann NY Acad Sci 2010**; 1184: 173.
3. Sinha S, Taly AB, Ravishankar S, et al. Wilson's disease: cranial MRI observations and clinical correlation. **Neuroradiology 2006**; 48: 613–621.
4. Prashanth LK, Sinha S, Taly AB, Vasudev MK. Do MRI features distinguish Wilson's disease from other early onset extrapyramidal disorders? An analysis of 100 cases. **Mov Disord 2010**; 25: 672.
5. Roberts EA, Schilsky MLAmerican Association for Study of Liver Diseases (AASLD). Diagnosis and treatment of Wilson disease: an update. **Hepatology 2008**; 47: 2089.