Keng Yin Loh
Siang-Tong Kew

The eyes have it

A diagnostic challenge

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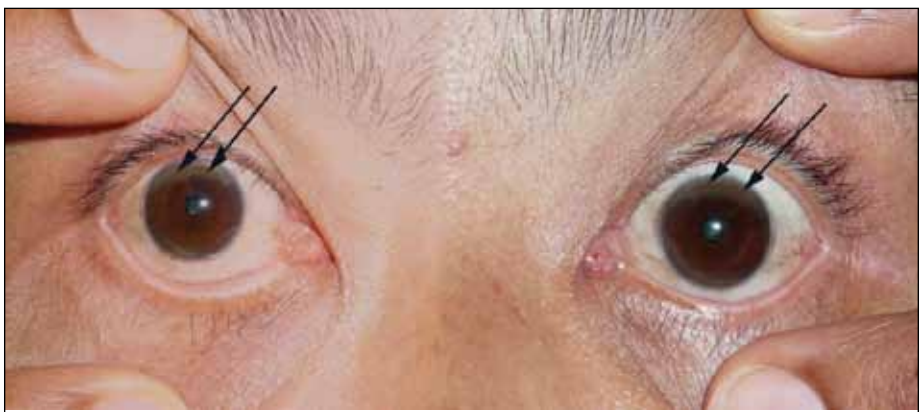

Figure 1. Appearance of eyes of patient, with abnormality indicated by arrows

Case study

Mr ML, a male patient, 35 years of age, presents with a 5 year history of tremors, slurring of speech, and ataxia. He has no significant family history, both his parents and his only sister are well. Ultrasound of his liver reveals signs of cirrhosis. *Figure 1* shows the appearance of the limbus of his cornea. He has no ocular complaints.

Question 1

Describe and name the findings from *Figure 1*.

Question 2

What is the diagnosis?

Question 3

What is the pathology of this disease?

Question 4

What are the laboratory tests for this disease?

Question 5

What are the associated complications of this disease?

Answer 1

There is a brownish rim surrounding the limbus of the cornea bilaterally. These are Kayser-Fleischer rings.

Answer 2

Wilson disease.

Answer 3

Wilson disease is an autosomal recessive disorder of copper metabolism. It is caused by a chromosomal defect of 13q, affecting the ATP7B gene which codes for a P-type ATPase that transports copper and incorporates it into ceruloplasmin.[1] This leads to excessive copper accumulation in the liver, leading to hepatocellular injury. Liver cirrhosis is one of the most common complications to occur in patients with Wilson disease in the second decade of life. Later, copper deposition occurs in other organs such as the brain, kidney and pancreas. Kayser-Fleischer rings are caused by copper precipitate at the Descemet membrane in the limbus of the cornea. It is reported that Kayser-Fleischer rings are present in up to 90% of patients with neuropsychiatric Wilson disease, and in up to 80% of patients with hepatic involvement.[2]

Answer 4

In Wilson disease, serum ceruloplasmin is usually low (<0.2–0.4 g/L) with a high 24 hour urinary copper excretion (>1.0 µmol/day). Clinical diagnosis can be made according to the Sternlieb criteria when at least two of the following features are present:

- Kayser-Fleischer rings
- typical neurologic symptoms
- low ceruloplasmin levels.[3]

The gold standard for diagnosis of Wilson disease is a copper content of liver biopsy exceeding 250 µg/g of dry weight (normal <50 µg/g).[4]

Answer 5

Besides liver cirrhosis, neuropsychiatric complications are common in Wilson disease. Dystonia, fits, abnormal speech and parkinsonism have all been reported. Cognitive, behavioural and schizoaffective disorders have also been associated with Wilson disease. Other systemic complications include early onset of arthritis, osteopenia, hemolytic anemia, renal impairment and calculi.[2]

Learning points

- Wilson disease is rare, but it must be considered as a differential diagnosis in a young man who presents with neurological symptoms such as ataxia and liver cirrhosis.
- Kayser-Fleischer rings are one of the most important physical findings of Wilson disease in the primary care setting and requires careful eye examination to note.
- Wilson disease can be controlled by a copper chelating agent (d-penicillamine) and if diagnosed early and treated accordingly, the patient can often enjoy a good quality of life.

Authors

Keng Yin Loh MMed, is Associate Professor, Department of Family Medicine, International Medical University, Seremban, Malaysia. kengyin_loh@imu.edu.my

Siang-Tong Kew FRCP, is Professor, Department of Internal Medicine, International Medical University, Seremban, Malaysia.

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correspondence **afp@racgp.org.au**