EYE IS THE WINDOW OF THE BODY

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At presentation

- 13 year old male child
- Informer : Caretaker (Maternal aunt)
- Reliability : Fair
- Complaints :
  - Missing from home for 1 hour
  - According to the child Complaints of loss of consciousness with vomiting(4 to 5 episodes)

History of Presenting illness

- Developmentally normal child
- According to the aunt, child was missing from home for an hour(7 to 8am)
- Subsequently the family was called by a stranger that the child is 2 streets behind
- The child could not recollect the events leading upto being collected by his caretakers

Negative history

- No history of any psychiatric manifestations (depression , anxiety, OCD) earlier
- No history of seizures in the past
- No history of abdominal pain or loose stools
- No history of fever or blurring of vision
- No history of any drug intake
- No history of any quarrels with neighbour or friends

History…

- Past History : No history of similar episodes in the past
- Personal History : History of bed wetting present.
  No history suggestive of any substance abuse
- Birth History : Uneventful
- Immunization History : Immunized upto date
- Nutritional History : Mixed Diet

Developmental History

- Studies 9th grade in an English medium school
- Average scholastic performance which has deteriorated over the past few months
- No change in handwriting
- Interested in drawing
- Does not mingle well with others, basically a shy type of personality

Family History

- First born of non consanguineous marriage
- Mother passed away when the child was one and half years due to suspected dengue fever
- Adopted by Paternal uncle and care by them
- No history suggestive of any psychiatric or genetic or liver disease , neurological disease in the family

General examination

- Vitals :

Temp – 98 degree F

Pulse :82/ min

BP : 110/70mm Hg

Mild Icterus Present

No pallor/cyanosis/clubbing/lymphadenopathy/ vitamin deficiencies/edema

Anthropometry within normal limits

Systemic examination

- CVS : S1 S2 +, no murmur
- RS : Bilateral air entry
- Per Abdomen : Soft, bowel sounds, Liver span : 11cm

  No tenderness and no ascites

  Hernial orifices : free

Systemic examination

- CNS :

  Higher mental functions : Normal

  Sensory Examination : Intact

  Motor system : Tone : Normal

  Power : Normal (5/5)

  Deep tendon reflexes : Present and normal

  Superficial reflexes : Normal

  Plantor : Flexor

- Psychology assessment: Average intelligence(IQ)with mild emotional disturbance

Provisional diagnosis

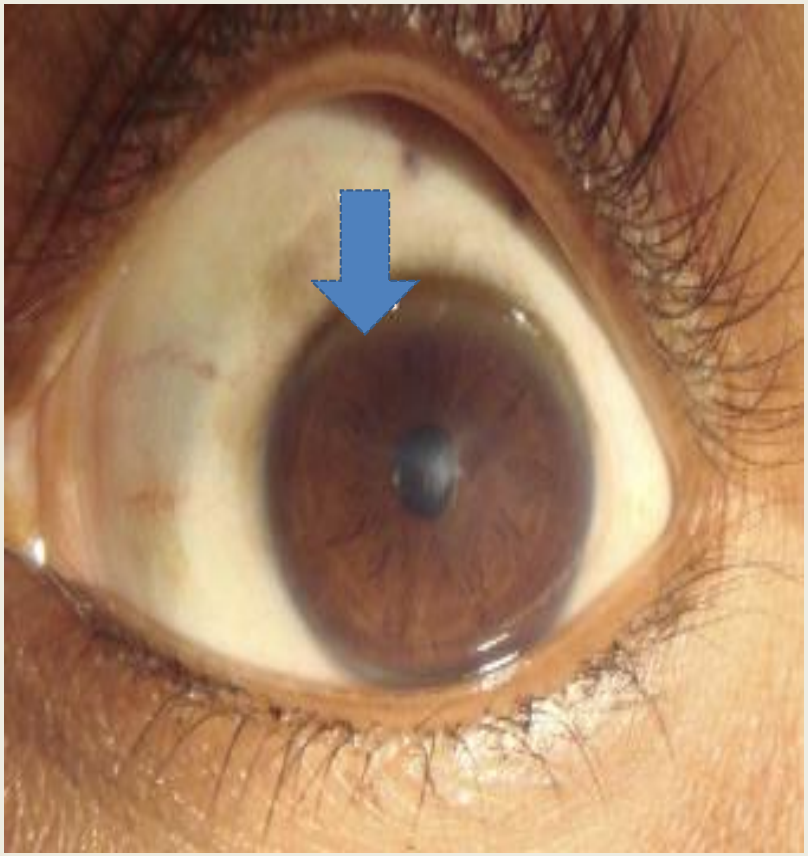
- ?Viral hepatitis
- ? Seizure disorder
- ? Psychiatric disorder

Investigations

- CBC : Normal limits
- PS : Normal
- RFT , Serum Electrolytes : Normal
- Urine routine : Normal
- LFT : Indirect bilirubin : 1.32 mg/dl
- Direct bilirubin : 0.13 mg/dl
  Total bilirubin : 1.41 mg/dl
  ALP – 251 U/L
  SGOT : 24 U/L
  SGPT : 31 U/L
  Total protein and albumin : 7.8 g/dl and 4.7 gm/dl respectively
  PT (10.8) INR (0.87)
  HbsAg and Anti HCV : Non reactive
  Uric acid : 8.8 mg/dl
- USG - Normal

Ophthalmology

- Bilateral Kayser Fleischer Ring !!!



Further work up

- Serum ceruloplasmin - 21.3 mg/dL (Normal :15 to 30)
- 24 hour baseline urine copper 7.14 mg/dl (normal : <= 53.9)
- Pencillamine challenge test performed
- 24 hour urinary copper level - 658.46mg/dL(10 fold increase).
- CT- Within normal limits
- EEG- Normal

Final diagnosis

Indirect hyperbilirubinemia

Minor behavioural changes

Dissociative fugue (Psychiatric manifestation)

Decreasing scholastic performance

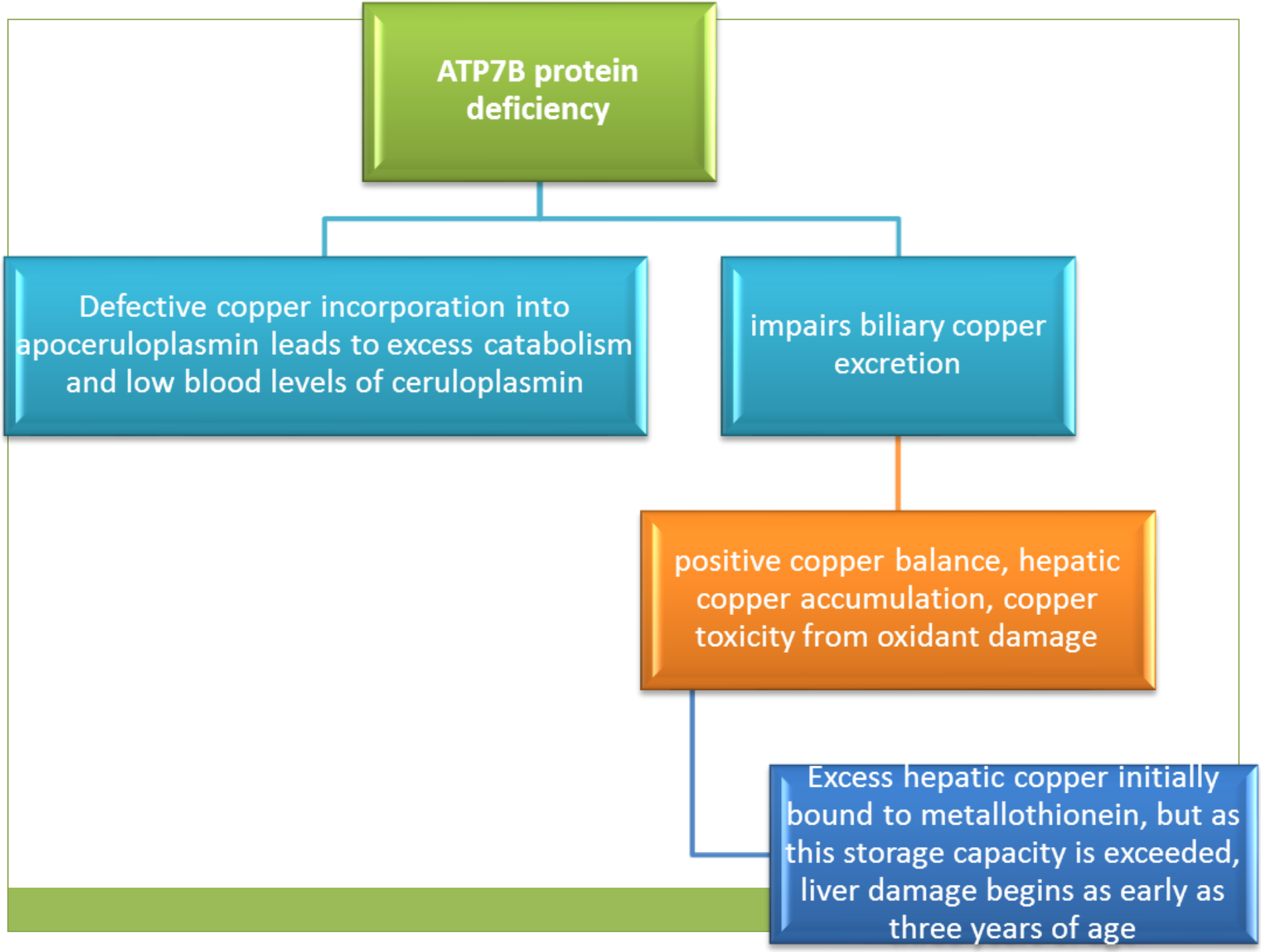
Neurological manifestation (?seizure)

Increased urinary excretion of copper levels (10 fold increase) after pencillamine challenge test

Wilson's disease

Literature Review

- Wilson's disease is an AR disorder caused by mutations in the ATP7B gene, located on chromosome 13
- Impaired normal excretion of copper causes accumulation of copper in various organs
- Prevalence of WD (1:1,500 – 1:3,000)
- Can present at any age, earliest age reported was 9 months


ATP7B protein deficiency
Defective copper incorporation into apoceruloplasmin leads to excess catabolism and low blood levels of ceruloplasmin
impairs biliary copper excretion
positive copper balance, hepatic copper accumulation, copper toxicity from oxidant damage
Excess hepatic copper initially bound to metallothionein, but as this storage capacity is exceeded, liver damage begins as early as three years of age

- Ionic copper inhibits pyruvate oxidase in brain and ATPase in membranes which leads to decreased ATP, Phosphocreatine and potassium content of tissue.

Clinical features

- **Hepatic presentation** include

  1.Asymptomatic hepatomegaly

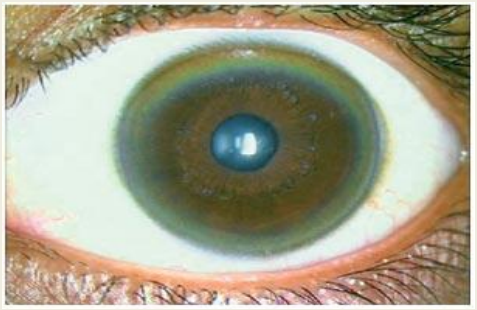
  2.Subacute or chronic hepatitis

  3.Fulminant hepatic failure

- **Neurological manifestations** include resting & intention tremor , spasticity, rigidity, chorea, dysphasia , dysarthria, dystonia, deterioration in school performance or behavioral changes

Kayser-Fleischer ring

- Copper deposition in the descemet's membrane of cornea as golden brown structure at **sclero-corneal junction.**



- Does not affect vision
- KF rings are not specific for WD, but pathognomonic if it is associated with neurological manifestations
- They may be found in other chronic liver disease, PBC, PSC, AIH, and familial cholestatic syndromes

Psychiatric manifestations

- Psychiatric symptoms can occur in both untreated and treated WD patients.
- Abnormal behavior, personality changes, anxiety and depression – common
- Psychosis, cognitive impairment, attention deficits- less common

Suspect Wilson's disease

1. Unexplained acute or chronic liver disease
2. Neurologic symptoms of unknown cause
3. Acute hemolysis
4. Psychiatric illnesses
5. Behavioral changes

ZINC MONOTHERAPY

- Zinc Induces Intestinal cell metallothionine, blocks absorption of Cu from intestine
- Blockage of resorption of Cu from saliva, Gastric juice, Intestinal secretion
- Inhibition of lipid peroxidation and the increase of available glutathione within hepatocytes, reducing oxidative Damage
- As Initial treatment, when neuro/psy manifestation
- Hepatic WD, Maintenance therapy , Pregnancy, Complications with D-Pen

Treatment

Drug	Mechanism Of Action	Recommended Use	Toxicity
Penicillamine	Chelator, urinary excretion of copper	In Hepatic involvement of wilsons disease Use has decreased because of neurological side effects.	Neurologic worsening, Acute hypersensitivity Proteinuria Bone Marrow suppression
Trientine	Chelator, urinary excretion of copper	Hepatic presentation with zinc, Second choice to zinc for many other types of patients	Proteinuria Bone Marrow suppression Trigger of autoimmune diseases ,Neurologic worsening
Tetrathiomolybdate	Complexor of copper with protein	Neurologic presentation	Reversible anemia Reversible elevation of AST and ALT

Diet

- A low copper diet includes avoiding chocolate, dried fruit, liver, mushrooms, and nuts.

References

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