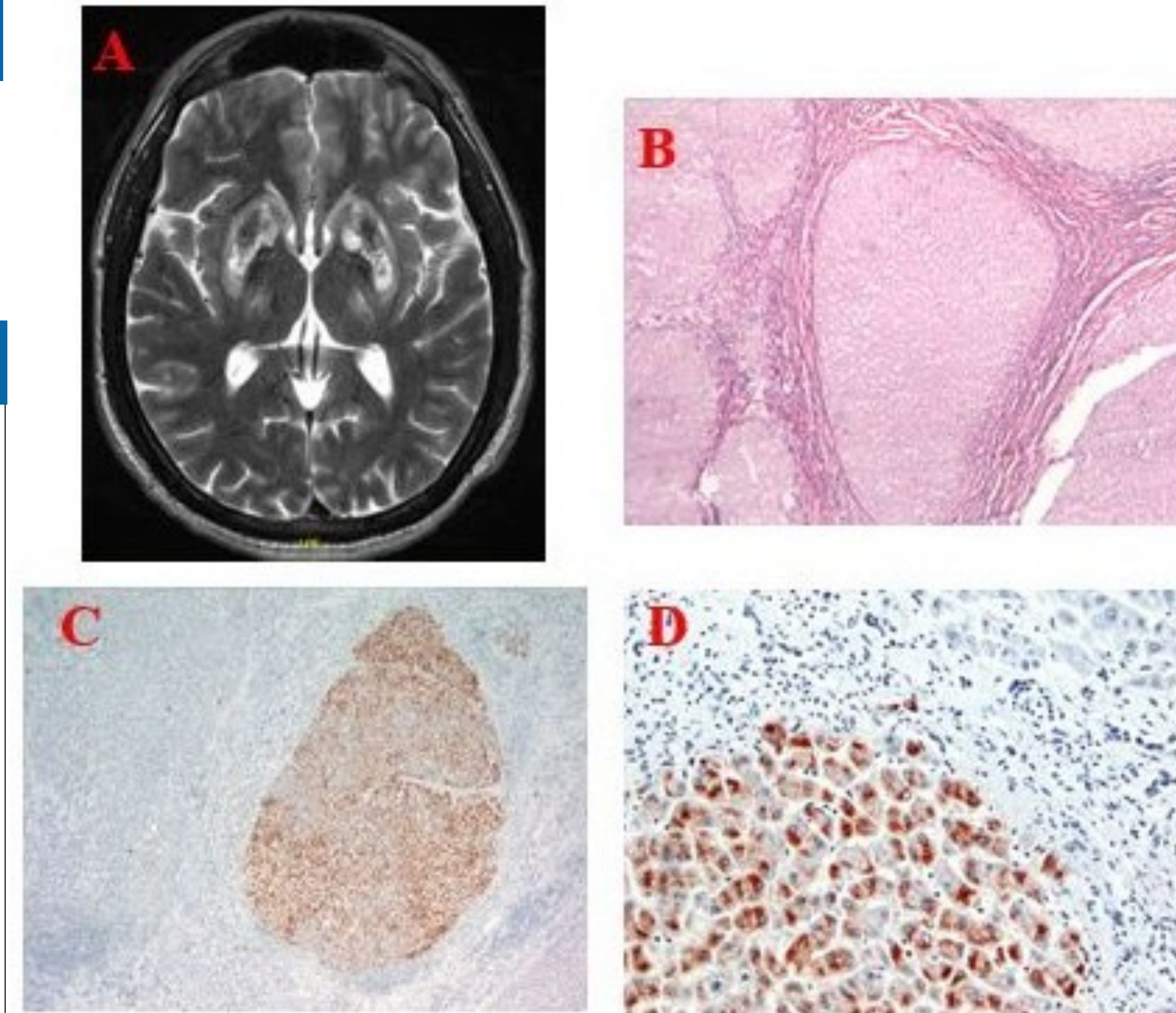


## Background

- The role of orthotopic liver transplant (OLT) solely for the management of neurological Wilson disease (WD) is unclear. We present a patient with WD who underwent OLT for neurological deterioration with compensated cirrhosis.

## Case Description

- A 19-year-old male presented with three-month history of dysarthria, akinesia, and fine tremors.
- His past medical history was remarkable for unexplained splenomegaly and thrombocytopenia.
- He denied history and risk factors for liver disease.
- Physical exam showed slurred speech, bilateral hand tremors, spasticity of the lower extremities, and absence of Kayser-Fleischer ring.
- Labs were unremarkable, except for platelets of 79 k/uL.
- MRI brain showed bilateral, symmetric hyper-intensity in the basal ganglia, lateral thalami and midbrain on T2-weighted images. CT liver revealed cirrhosis, portal hypertension, and mild splenomegaly.
- Copper metabolism study confirmed low serum copper (8  $\mu\text{mol/L}$ ) and high 24-hr urine copper (234  $\mu\text{g/d}$ ) consistent with diagnosis of WD.
- He was promptly started on Zinc and Trientine 250 mg daily. After one month, the patient was re-admitted for worsening dysphagia, dysarthria and rigidity, eventually becoming bedridden with inability to talk and eat requiring gastric tube placement.
- Liver biopsy showed cirrhosis with little inflammatory activity and abundant copper on Rhodanine stain (>600 mcg/g).
- The patient underwent OLT after being granted a Metabolic MELD exception of 40 due to medically unresponsive neurological impairment, with preserved liver function (calculated MELD 8).
- Post-OLT, he had gradual neurological improvement, except for persistent dystonia and spasticity.
- Serum ceruloplasmin levels normalized but repeat MRI showed persistent signal alterations at the basal ganglia and brainstem.
- At 16 month follow-up, his neurological recovery remained largely stagnant with minimal improvement in extrapyramidal symptoms.



**Figure 1**

(A) MRI Brain with contrast showing (T2/FLAIR) hyperintensity and mild edema symmetrically in the caudate heads, putamina, ventral lateral thalami, and midbrain. Findings are suspicious for Wilson Disease. (B) Cirrhotic nodules accompanying mild chronic inflammation (Hematoxylin and eosin, 100X). (C) The liver cells of this cirrhotic nodule are extensively filled with copper (Rhodanine stain, 100X). (D) The liver cells show bright red granules of copper in the cytoplasm (Rhodanine stain, 200X).

## Discussion

- OLT for management of neurological WD remains highly debatable.
- Most data on neurological recovery after LT are based on patients with mixed liver and neurological involvement with success rate of 62% in literature.
- In our patient, he failed to display complete neurological recovery 1.5 years after OLT despite initial improvement.
- The rapid neurologic deterioration that led to OLT occurred after initiation of chelation therapy which may indicate paradoxical worsening.
- Additional research is needed to determine the timing of OLT and role of medical optimization prior to OLT in patients with neurological WD.