

# Reversal of Severe Wilson Arthropathy by Liver Transplantation

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Wilson disease is associated with multisystem involvement. We describe a patient of Wilson disease with severe arthropathy, which completely reversed following liver transplantation. This is the first case report in literature describing the complete reversal of Wilson disease related arthropathy by liver transplantation.

**Key words:** Arthropathy, Children, Copper, d-penicillamine, Wilson disease.

An 11-year-old boy presented with episodes of recurrent jaundice of two years duration. On investigations he was diagnosed to have Wilson disease (low serum ceruloplasmin, high urine copper, slit lamp showing KF rings and sunflower cataracts). He had no neurological symptoms. He had a serum bilirubin of 3.5 mg/dL (direct 2 mg/dL), AST-104 IU/L, ALT - 205 IU/L, ALP - 160 IU/L, serum albumin - 2.9 g/dL, INR - 1.8, Hb - 10.8g /dL, WBC - 4800/cmm, platelets - 88,000/cmm. USG of the abdomen showed a cirrhotic liver with portal hypertension and free fluid in peritoneal cavity. He was initially treated with D-penicillamine. He was fairly well compensated for about one and half years while on D-penicillamine. However, his white cell count and platelet counts progressively decreased (lowest WBC count was 2100/cmm and platelet count of 35,000/cmm) and this was attributed to a combination of hypersplenism and D-penicillamine and he was switched to trientine. After two months, his liver decompensated after an episode of fever and spontaneous bacterial peritonitis. He had a rising bilirubin and grade two hepatic encephalopathy with a deteriorating coagulation profile. He developed progressively increasing joint involvement, which started a month after the episode of encephalopathy.

The joint pains involved both large and small

joints (knees, ankles with small joints of the fingers and toes). The involvement was symmetrical, with tenderness and restricted joint mobility with swelling of the knee joints, which seemed to be predominantly involved. The joint pains severely affected his activities of daily living including sleep. He was investigated for the arthropathy - anti nuclear antibody, rheumatoid factor, direct coomb's test, chikungunya IgM antibody, and HLA B27- were negative; serum uric acid was 1.8 mg/dL (2.5-7.8 mg/dL) and anti streptolysin O showed a normal value of less than 200 Todd units.

X-ray of the knee joints revealed periarticular soft tissue swelling and osteopenic bones. Ultrasound of the knee joints revealed bilateral effusions of the suprapatellar bursae. MRI of the brain did not show any evidence of copper deposition. Since no other cause of joint pain was found, a diagnosis of Wilson's arthropathy was made. He was treated with paracetamol and opiate based drugs for the joint pains and local fomentations, which provided minimal relief.

Subsequently, he underwent a living related right lobe liver transplantation (donor being his mother) after 2 months of decompensation (in the form of fever, SBP and hepatic encephalopathy). At the time of transplantation, his PELD (Pediatric end stage liver disease) score was 36 and the liver profile at the

time of liver transplantation revealed AST – 305 mg/dL, ALT–290 mg/dL, GGTP–275 mg/dL, total bilirubin – 20.4 mg/dL, direct bilirubin – 14.3 mg/dL, INR – 3.4, serum creatinine – 0.4mg/dL, serum albumin – 2.5mg/dL. He was initially on tacrolimus and steroid based immunosuppressive therapy and later switched to cyclosporine due to tacrolimus related toxicity.

The joint problem showed remarkable improvement, with complete disappearance of the pain and joint swellings as soon as he was mobilized by the fourth day post transplantation. He is now one and half years post transplantation and has no joint pains, with a normal liver profile and leading a normal life.

## DISCUSSION

Our patient presented as an established case of Wilson disease with primary liver involvement and development of symmetric polyarthropathy. He had been treated with D-penicillamine for one and a half years. However, the arthropathy started after discontinuation of the drug thereby ruling out D-penicillamine induced arthropathy. Unlike Wilson disease related arthropathy, which is a chronic joint damage, penicillamine induced arthropathy is an acute problem, which subsides on stopping the drug or decreasing its dose. It is in fact a manifestation of delayed hypersensitivity reaction in response to D-penicillamine [1]. The possibility of juvenile idiopathic arthritis was not considered since a minimum duration of 6-12 weeks of joint pains is an essential criteria for its diagnosis [2]. This was not the case in our patient. We also ruled out other causes of arthropathy.

The arthropathy of Wilson disease is usually a late occurrence in the course of the disease process, frequently occurring after 20 years of age although it

could be the initial presenting feature of the disease. It occurred two years after the onset of liver symptoms in our patient. Symptomatic joint disease occurs in 25-50% of such patients. The joint pathology is a degenerative process resembling premature osteoarthritis in addition to generalized osteopenia [3]. Synovial copper deposition has been postulated as the likely explanation for the occurrence of arthropathy [3,4]. Wilson disease related arthropathy has been described more often in patients who had become neurologically disabled [5]. In our patient, there was no evidence of neurological involvement either clinically or on imaging. It was unlikely that the joint pains responded to steroids, as there was no evidence of other etiologies (SLE or Juvenile idiopathic arthritis) on workup, which would respond to steroids.

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