

## Abstract

**Aim:** In this case series, we report three cases of severe ischemia-reperfusion injury following liver transplantation with unexpected clinical course.

**Cases Presentation:** Three cases of patients with autoimmune hepatitis, alcoholic cirrhosis, and idiopathic liver cirrhosis were selected. All of them underwent liver transplantation. A few hours after the surgery, their liver enzymes started to rise to the thousands raising concern for ischemia-reperfusion injury. Patients received supportive care. After a few days of observation, liver enzymes started to decrease unexpectedly, reaching a normal level after a week and they gradually improved.

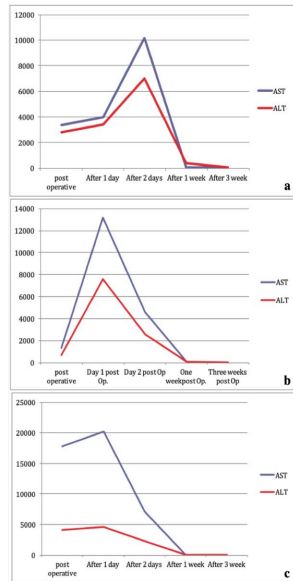
**Conclusion:** These cases highlight the importance of considering parameters such as the clinical picture and radiological findings before determining the outcome of ischemia-reperfusion injury following liver transplant.

## Introduction

- Severe ischemia-reperfusion injury is a **deadly** complication after liver transplantation that is characterized by a significant **elevation** of liver enzymes.
- It is usually complicated by severe organ **dysfunction, rejection, and re-transplantation.**
- In this case series, we report three cases of severe ischemia-reperfusion injury following liver transplantation with **unexpected** clinical course.

## Cases Presentation

- **Three** cases of patients with a diagnosis of liver disease requiring transplant were identified.
- The **first** case is a 32-year-old female who was diagnosed with autoimmune hepatitis that eventually progressed to cirrhosis. She required liver transplant due to multiple episodes of decompensation.
- The **second** case is a 57-year-old female who was diagnosed with alcoholic cirrhosis requiring transplant for recurrent decompensated cirrhosis.
- The **third** case is a 43-year-old male who was diagnosed with idiopathic cirrhosis after ruling out metabolic, viral, and autoimmune causes.
- All of them underwent liver **transplantation**. A few hours after the surgery, their liver enzymes started to **rise** to the thousands raising concern for **ischemia-reperfusion injury (Image 1)**.
- Patients remained clinically stable with **reduced** but **preserved** urine output and state of consciousness. Doppler-ultrasound of the graft revealed **patent** hepatic artery, hepatic vein, and portal vein. Therefore, the patients only received **supportive** care.
- After a few days of observation, liver enzymes started to decrease unexpectedly, reaching a normal level after a week. The patients gradually improved, and their liver function remained stable upon follow-up after discharge from the hospital.



**Image 1.** Post-transplant AST and ALT levels in patient with autoimmune hepatitis (a), alcoholic cirrhosis (b), and liver cirrhosis of unknown origin (c)

## Discussion

- Severe ischemia-reperfusion injury is a **deadly** complication of liver transplantation. Liver function test abnormalities following liver transplantation are a **hallmark** of the clinical presentation. Upon diagnosis, the outcome is usually **poor** without re-transplantation.
- In this study, we presented three cases of patients with increased LFTs following liver transplantation, who **improved** with **supportive** measures alone.
- Although LFTs are commonly accepted as **indicators** of liver injury post-transplant, these cases highlight the importance of taking into account other parameters such as the **clinical** picture and **radiological** findings before determining the outcome of ischemia-reperfusion injury following liver transplant.

## Conclusion

- These three cases **highlight** the importance of considering the overall clinical picture prior to determining the **severity** and **management** of ischemia-reperfusion injury following liver transplantation.
- In addition to liver function tests, assessing the hemodynamic status, kidney function, and neurological status is necessary to **avoid** unnecessary and invasive measures such as liver **re-transplantation**.

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### References:

1. Howard TK, Kleinman GR, Caffey JR, Fleckner RS, Goldstein RM, Green TS. The influence of preservation injury on rejection in the hepatic transplant recipient. *Transplantation* 1980;30(4):404-7.
2. Fung JH, Alagramso LM, Bachman W, Lerman H, Weln J, Zinner H. Postischemic reperfusion injury and allograft arteriosclerosis. *Transplant Proc* 1986;19(2):427-8.
3. Fernandez C, Bauriedl R, Kupfer-Vergara J. Is hepatic ischemia/reperfusion injury a death knell? *Am J Med Sci* 2003;326(7):486-9.
4. Savatovsky IF, Haidich A, Mahesh BI. Hepatic ischemia/reperfusion injury. *Am J Surg* 2005;189(2):160-6.
5. Peng H, Czirjakovics SSJ, Krenkelitz D, Ungai MZ, Pusch D, Hoffmann RM, et al. Malfunction of the liver after transplantation: an analysis of potential risk factors. *Transplant Proc* 1993;25(1):1409-12.