

# Dengue Virus Transmission from Living Donor to Recipient in Liver Transplantation: A Case Report

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Many infections are transmitted from a donor to a recipient through organ transplantations. The transmission of dengue virus from a donor to a recipient in liver transplantation is a rare entity, and currently, there is no recommendation for screening this virus prior to transplantation. We report a case of transmission of dengue virus from donor to recipient after liver transplantation. The recipient had a history of multiple admissions for hepatic encephalopathy and ascites. He was admitted in the ICU for 15 days for chronic liver disease, ascites, and acute kidney injury before transplantation. The donor was admitted 1 day before transplantation. The donor spiked fever on postoperative day 2 followed by thrombocytopenia and elevated liver enzymes. The donor blood test was positive for dengue NS1 antigen. The recipient also had a similar clinical picture on postoperative day 5 and his blood test was also positive for dengue NS1 antigen. Hence, the diagnosis for posttransplant donor-derived allograft-related transmission of dengue infection was made. Both recipient and donor were treated with supportive measures and discharged after their full recovery on postoperative days 9 and 18, respectively. The effect of immunosuppression on dengue presentation is still unclear and there is lack of literature available. In our case, the recipient developed dengue fever similar to general population without showing any feature of severe graft dysfunction. We have concluded that dengue virus can also be transmitted from donor to recipient, and immunosuppression did not have any adverse effect on the evolution of dengue fever within the recipient. Delhi being a hyperendemic zone, screening for donors (especially in season time) for dengue virus seems to be the best preventive method to control donor-derived transmission of dengue to recipient. (J CLIN EXP HEPATOL 2016;6:59–61)

The epidemiology of dengue, an endemic disease, has been changing rapidly in Delhi. Transmission of dengue virus from donor to recipient is rarely reported. Currently, there is no recommendation for screening this virus prior to transplantation. We describe a case of transmission of dengue virus from donor to recipient after liver transplantation.

## CASE

A 40-year-old man presented with cryptogenic liver disease (since 2013). He was admitted with features suggestive of decompensated chronic liver disease with ascites (no SBP), AKI, and hepatic encephalopathy. He had history of multiple admissions in the past with a diagnosis of hepatic encephalopathy. In view of recurrent hepatic encephalopathy and decompensated chronic liver disease with child class C (13/15) MELD score of 26, the patient was advised for liver transplantation. The donor was his 29-year-old brother-in-law, who was admitted 1 day prior to transplant. He was evaluated as per protocol. After stabilization of recipient (15th day of his admission), he underwent living donor liver transplantation, which was uneventful.

The donor spiked fever of 103 °F on POD 3 and continued to have fever for the next 2 days. He also had transaminitis on POD 3, which kept on increasing till POD 5 (SGOT/SGPT increased from 273/286 to 341/292). The platelet count of the donor started to decrease from 211000 on POD 2 to its nadir level of 55,000 on POD 6. The results of Doppler ultrasound, full septic workup, and blood and urine culture were normal. The drain content was serous. Considering the clinical scenario of the patient (as fever, thrombocytopenia, and deranged liver enzymes) and

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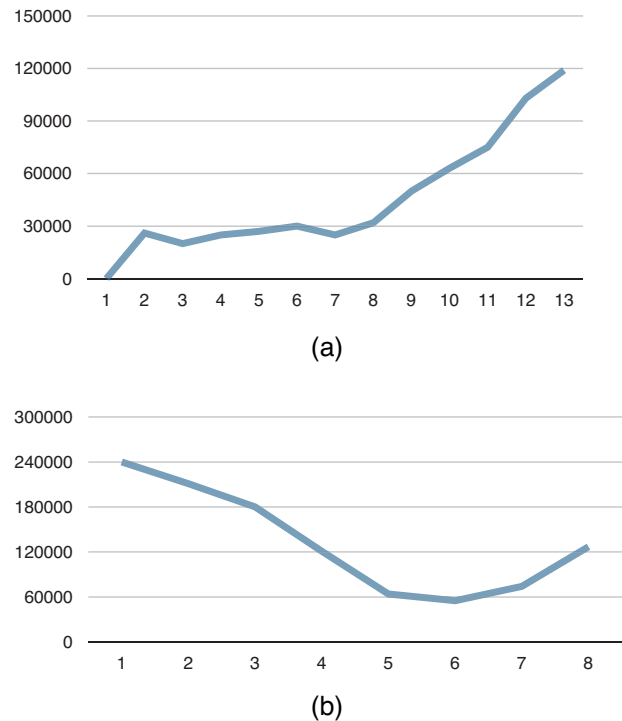
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**Abbreviations:** LDLT: living donor liver transplantation; ICU: intensive care unit; POD: postoperative day; NS 1 antigen: nonstructural protein 1 antigen; SBP: spontaneous bacterial peritonitis; AKI: acute kidney injury; MELD: model for end-stage liver disease; SGOT/SGPT: serum glutamic-oxaloacetic transaminase/serum glutamic-pyruvic transaminase; deg F: degree Fahrenheit; PS for MP: peripheral smear for malaria parasite <http://dx.doi.org/10.1016/j.jceh.2016.01.005>

since Delhi being an endemic zone and this being a peak season for dengue (August–October), nonstructural protein 1 antigen and PS for MP were sent for analysis. The results were positive for dengue, nonstructural protein 1 antigen. The donor was treated conservatively and the fever declined to normal from POD 3 to POD 6. His liver enzyme and platelet count improved in serial blood reports and finally he was discharged on POD 9 from the hospital (Figures 1 and 2).

The recipient had expected recovery and graft function till POD 5, on which, he spiked the body temperature of 101 °F. His liver enzymes, SGOT/SGPT, also increased from 89/111 to 238/270 from POD 3 to POD 6. His platelet count dropped to 25,000 on POD 7. His liver Doppler ultrasound examination was normal. Since donor was already tested positive for nonstructural protein 1 antigen, we decided to send recipient blood for NSP 1 antigen, which also showed positive. After treatment with conservative measures, the fever subsided in the next 2 days with gradual improvement of liver enzyme and platelet count.



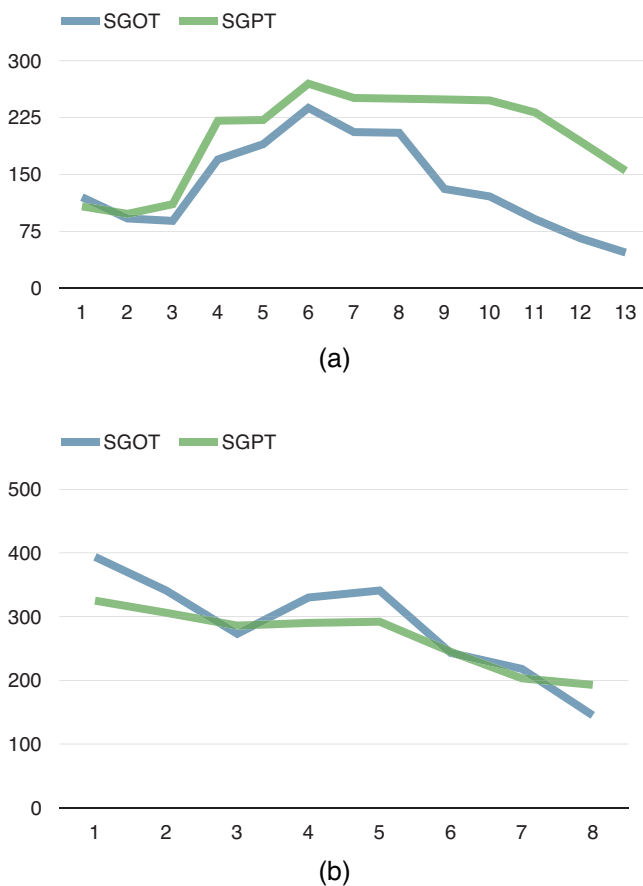
**Figure 2** (a) Fall in platelet count (recipient) followed by its improvement (X axis: postoperative day, Y axis: platelet count). (b) Fall in platelet count (donor) followed by its improvement (X axis: postoperative day, Y axis: platelet count).

After a full recovery from dengue fever, the recipient was discharged on POD 18 (Figures 1 and 2).

**DISCUSSION**

Many infections (viral, fungal, protozoal, and bacterial) have been found to be transmitted from donor to recipient through organ transplantation. When an infection is transmitted, it is typically associated with significant morbidity and mortality; cases that are associated with less severe disease (e.g., transient bacteremia that responds quickly to therapy) are likely to be underrecognized and, therefore, underreported. The risk of transmission of a blood-borne virus through organ transplantation is directly related to the prevalence of the virus in the donor population, the viral load in the donor, the organ allograft transplanted, and the efficiency of virus transmission after contact with blood and tissues.<sup>1</sup>

Because many viruses can replicate in the liver, liver transplantation is also associated with the transmission of viruses that classically cause hepatitis as well as blood-borne viruses without hepatitis as a predominant manifestation. Although a number of viral infections (like hepatitis B, hepatitis C, cytomegalovirus, and Epstein-Barr virus) have been transmitted through organ transplantation, dengue is more prevalent in tropical countries. In the last two decades, dengue incidence has grown dramatically,



**Figure 1** (a) Trend of SGOT and SGPT (recipient) in postoperative period (X axis: postoperative day, Y axis: value of SGOT and SGPT in IU/ml). (b) Trend of SGOT and SGPT (donor) in postoperative period (X axis: postoperative day, Y axis: value of SGOT and SGPT in IU/ml).

due to the expanding geographic distribution of the virus and the mosquito vector, the increased frequency of epidemics, the cocirculation of multiple virus serotypes, and the emergence of Dengue hemorrhagic fever in new areas.<sup>2,3</sup>

Dengue is transmitted by the mosquitoes *Aedes aegypti* and *A. albopictus*, which are found throughout the world. Symptoms of infection usually begin 4–7 days after the mosquito bite and typically last 3–10 days. It should be noted that there are few nonvector-borne modes of dengue transmission. These uncommon modes of transmission are identified as vertical transmission from mother to fetus, transfusion-related transmission, transplantation-related transmission, and needle stick-related transmission.<sup>4</sup>

Transmission of dengue via organ transplantation is rarely reported. To the best of our knowledge, only three reports of transplantation-related transmission of dengue have been mentioned in the literature, one each for bone marrow transplantation,<sup>5</sup> renal transplantation,<sup>6</sup> and liver transplantation.<sup>7</sup> This is the second reported case of transmission of a dengue infection from a donor to a recipient after living donor liver transplantation.

As there is lack of literature available regarding transplantation-related transmission of dengue infection, biology of dengue transmission via this mode is unknown. We need further data to assess the effect of dengue virus on graft function and the effect of immunosuppression on the presentation of dengue in the scenario of LDLT.

In our case, the recipient showed presentation similar to general population without any feature of severe graft dysfunction. Diagnosing dengue in liver transplant recipient is difficult as patient is on immunosuppressant, which may mask some of the symptoms of dengue fever. The diagnosis may be delayed if fever and thrombocytopenia are initially attributed to resolving portal hypertension. Dengue NS 1 antigen is a more sensitive and specific method for the diagnosis of dengue virus.<sup>8</sup>

## CONCLUSION

Dengue virus can be transmitted from a donor to a recipient. In our case, immunosuppression did not have any adverse effect on evolution of dengue fever in the recipient. We need further data to draw firm conclusion on transplantation-related transmission of dengue in the scenario of LDLT. Delhi being a hyperendemic zone, screening (especially in season time) of donor for dengue virus is also the best preventive method to avoid donor-derived transmission of dengue from a donor to a recipient.

## CONFLICTS OF INTEREST

The authors have none to declare.

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