LETTER TO THE EDITOR PEER REVIEWED | OPEN ACCESS

Re-do liver transplantation in a young patient with chronic myeloid leukemia following a recent sepsis episode

Judith Chiefer, Edward Mathers, Paul Bras, Zoka Milan

To the Editor,

Improvements in our knowledge of and experience with liver transplantation (LT) have led to LT for patients who were once considered too unwell for LT, with less than 50% chance of survival. One group of patients who meet those criteria comprise patients who had LT as children, decades ago, and who require a second or third liver transplantation years after the first procedure. Every re-do liver transplantation is more challenging for the liver transplantation team, and the outcome is less favorable. However, the fact that young patients are unwell, and that their only chance of survival is a new LT, put the liver transplantation team under pressure to perform liver transplantation and achieve good results that were not previously achievable.

We present a case of a young patient who was very unwell and who underwent re-do liver transplantation 21 years after the first liver transplantation as a seven-year-old child. He had additional risk factors, including chronic myeloid leukaemia (CML), advanced graft cirrhosis, acute on chronic kidney injury, and was recovering from a recent septic episode.

The indication for first liver transplantation of the patient was familial intrahepatic cholestasis because of an MDR3 mutation. He received a left-lobe graft from his mother and lived a full and active life. His immunosuppression comprised tacrolimus and corticosteroids. At the age of 25 years, a liver biopsy confirmed cirrhosis of the liver graft.

Two years later, he was assessed for re-do liver transplantation with model for end-stage liver disease (MELD) score 21, United Kingdom Model for End-Stage Liver Disease (UKELD) score 57, and child–pugh score 10. There was a waiting list mortality rate of 20% and a post-transplant survival rate of 85–90% calculated/predicted.

Four months after listing, he was diagnosed with CML, BCR-ABL1 positive, and underwent chemotherapy with hydroxycarbamide, which was eventually stopped because of thrombocytopenia. He spent another two months in the hospital, intermittently on the medical ward and in the intensive care unit (ICU), treated for recurrent thrombocytopenia, anemia, recurrent septic episodes, spontaneous bacterial peritonitis, and acute-on-chronic kidney injury.

Following a long, detailed interdisciplinary discussion, we decided to proceed with re-listing for an LT. Ten days post-re-listing, while the patient was in the ICU, the general impression was that his only chance for survival was liver transplantation and that the current condition was the best achievable in his circumstances.

When a good-quality donation after brain death (DBD) graft became available two days later, patient's white blood cell count (WBC) was 120,000/mm^3; he was anuric, on continuous veno-venous hemofiltration (CVVH), minimal inotropic support (noradrenaline infusion 0.1 µg/kg/min), and antibiotic and anti-fungal treatment (tigecycline and AmBisome). The general view was that he was just recovering from the most recent episode of sepsis.

He was breathing spontaneously, with an oxygen mask and an oxygen flow of 4 L/min. He was very slim (body mass index 16.3), weak, sleepy, and slow to respond to a verbal command.

The liver transplantation was technically difficult and lasted 10 hours: the dissection phase was three hours long; he was anhepatic for slightly more than 1 hour; and the arterial and biliary anastomoses took a long-time. Extensive bleeding was caused by adhesions and portal hypertension combined with end-stage liver disease

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characteristic coagulopathy. The estimated blood loss was 30 L, approximately eight times his total blood volume. It had a positive effect in that his total blood volume was washed out several times through a cell saver and his WBC was reduced by 60% to 60,000/mm^3 at the end of the liver transplantation.

The patient remained anuric and on CVVH throughout the procedure, received 3.7 L of blood from the cell-saver and 5.4 L of heterologous blood, 8 L of fresh frozen plasma (FFP), cryoprecipitate (Cryo), and platelets (Pt) (FFP:Cryo: Pt= 4.2:1.8:1) with 10 L of colloid and 3 L of crystalloid. He was also given antibiotics and anti-fungal medications several times and, at the end of the liver transplantation, he was on significant inotropic support (0.5 µg/kg/min).

Postoperative problems included prolonged vasopressor support, acute kidney injury (AKI)-CVVH dependence, coagulopathy, recurrent bleeding, septic episodes, myopathy, prolonged respiratory weaning, and CML treatment. The patient underwent a laparotomy for washout and a liver biopsy and percutaneous tracheostomy to facilitate weaning from mechanical ventilation. His tracheostomy cannula was removed three months postoperatively. He was discharged from the ICU four months and one week post liver transplantation.

Five months post liver transplantation, the patient is currently on a medical ward, on intermittent dialysis, with myopathy and regular physiotherapy, making slow but constant progress.

The patient we presented developed liver graft failure during late adolescence, a condition already recognised in the current literature [1]. He also developed HML 20 years after the live-related-donor liver transplantation and long-standing immunosuppression. Although the first case of HML post liver transplantation and hemotherapy was first reported in 2007 [2], it has recently been reported that the incidence of HML following solid organ transplantation can be as high as 4 in 2088 kidney and liver transplants [3].

Our patient already had chronic kidney injury (CKI) caused by immunosuppression, complicated with an acute kidney injury (AKI), a well-known occurrence during end-stage liver failure, confirmed with high MELD and UKELD scores.

Sepsis has long been an absolute contraindication for liver transplantation. However, with better understanding and improved antibiotic therapy in transplant patients, there is evidence of better survival in septic post-transplant patients compared with septic non-post-transplant patients [4]. Our patient was just recovering from a recent sepsis episode and the general consensus was that he was in the optimal condition for liver transplantation given his circumstances. He underwent a long surgical procedure complicated with massive bleeding, followed by a prolonged ICU stay. Although his postoperative course was prolonged, he is making good progress.

The patient, his family and the liver transplantation team think that the procedure was worthwhile. With patients of this type, we are pushing the boundaries and improving both survival and quality of life post-liver transplantation.

Keywords: Chronic hyeloid leukemia, Liver Transplantation, Sepsis

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Judith Chiefer – Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published

Edward Mathers – Conception and design, Acquisition of data, Analysis and interpretation of data, Final approval of the version to be published

Paul Bras – Conception and design, Acquisition of data, Analysis and interpretation of data, Final approval of the version to be published

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Conflict of Interest

Dr Zoka Milan is Editor-in Chief of Edorium Journal of Anesthesia.

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