

Updates in Surgery and Beyond

Progress of Liver Transplantation Combined with Artificial Liver System for Treatment of Liver Failure

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Liver failure is a syndrome with rapid progress, poor prognosis and a high mortality estimated 60-80%. Its therapy includes comprehensive internal medication, artificial liver system (ALS) and liver transplantation, among which artificial liver can significantly reduce the mortality of patients with liver failure and has become a very effective and feasible method because ALS provide essential liver functions, enable the failure liver to recover or as a bridge to liver transplantation. The application of ALS before liver transplantation can effectively improve the internal environment disorders and enhance the tolerance to surgery, which could be used as an important part of pre-operative preparation. Timely use of ALS after surgery could improve the physiological disorders and endurance of rejection period and provide time for the recovery of donor livers, therefore, improve the success rate of transplantation.

From middle 1980s to late 1990s, we began to use plasma exchange to treat liver failure and gradually developed a new artificial liver system-Li's artificial liver system (Li-ALS), to improve the survive rate of patients with hepatic failure. Li-ALS is classified into three types: Li's non-bioartificial liver (Li-NBAL), Li's bioartificial liver (Li-BAL) and Li's hybrid artificial liver (Li-HAL).

The Li-NBAL could decrease the mortality of acute and subacute severe hepatitis significantly from 88.1% to 21.1%, and the mortality of chronic severe hepatitis from 84.6% to 56.6%. Li-NBAL was implemented within 48 hours before liver transplantation significantly reduced MELD score of patients with severe liver disease, and reduced intraoperative blood loss (22%) and tracheal intubation time (27%). The 5-year survival rate of was significantly increased more than 80% when MELD score was below 30 before operation. In addition, our third generation market-oriented Li-NBAL are being developed. ALS combined with liver transplantation could be a promising method to improve the treatment of liver failure actively.