Management of Postoperative Complications In Liver Transplant Patients

Essay

Submitted in Partial Fulfillment of Master Degree in Intensive Care

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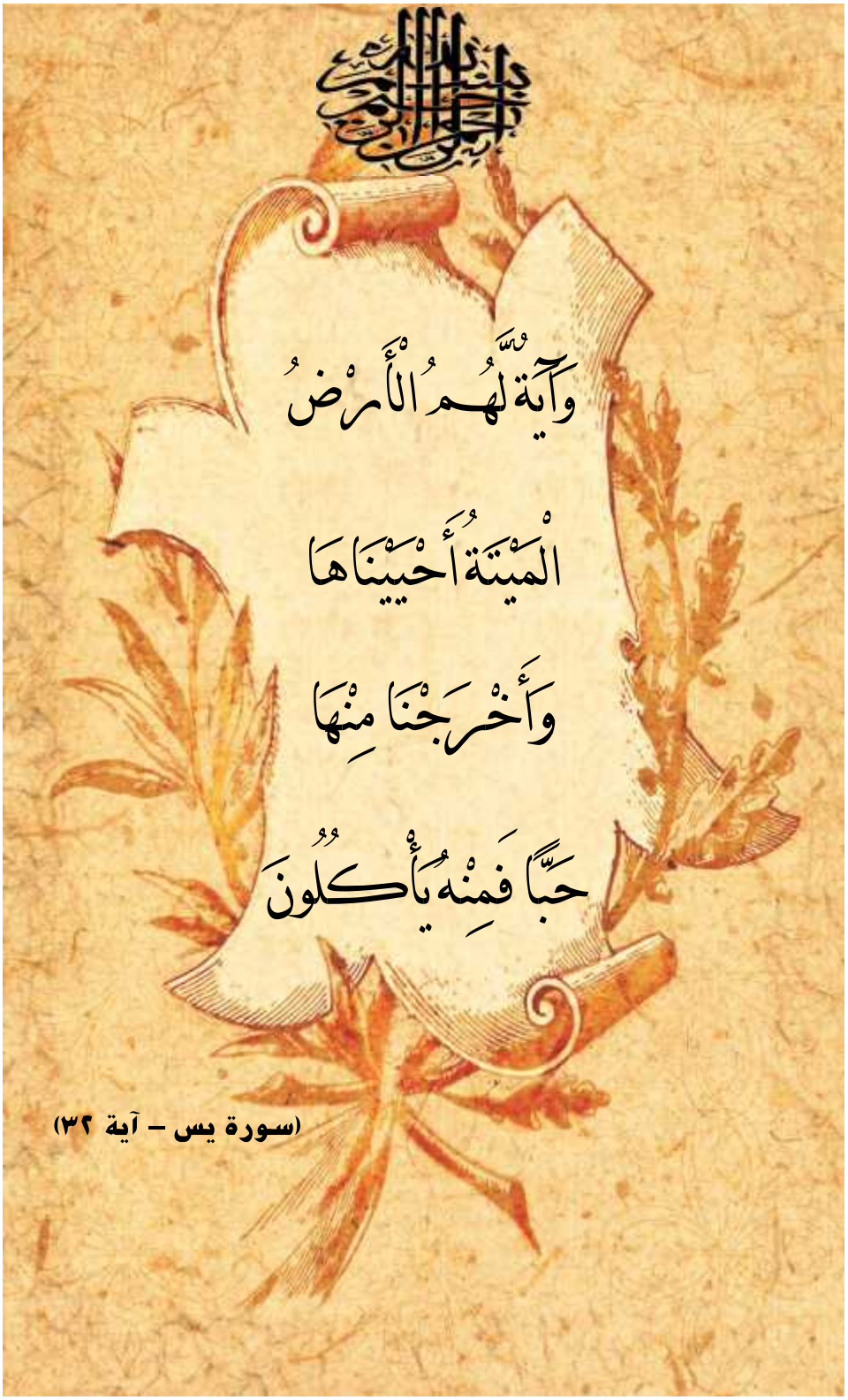
وَآيَةٌ لَّهُمُ الْأَرْضُ
الْمَيْتَةُ أَحْيَيْنَاهَا
وَأَخْرَجْنَا مِنْهَا
حَبًّا فَمِنْهُ يَأْكُلُونَ
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LIST OF ABBREVIATIONS

ACE	: Angiotensin-Converting Enzyme
ADH	: Alcohol dehydrogenase
ADV	: Adefovir Dipivoxil
AIDS	: Acquired Immunodeficiency Syndrome
ALT	: Alanine Transaminase
APCs	: Antigen Presenting Cells
AR	: Acute rejection
ARDS	: Acute respiratory distress syndrome
AST	: Aspartate Transaminase
ATG	: Antithymocyte globulin
ATN	: Acute Tubular Necrosis
ATP	: Adenosine triphosphate
AZA	: Azathioprine
B_2-MG	: B2-microglobin
BTP	: B-trace protein
CIN	: Calcineurin inhibitors
CMV	: Cytomegalovirus
CNS	: Central Nervous System
CO	: Cardiac Output
CT	: Computerized Tomography
CTP	: Child Turcotte
CVP	: Central Venous Pressure
CYP	: Cytochrome P450

LIST OF ABBREVIATIONS (Cont.)

DEAFF	: Detection of Early Antigen Fluorescent Foci
DEXA	: Dual Energy X-Ray Absorptiometry
ECG	: Electrocardiography
EEG	: Electroencephalogram
ERCP	: Endoscopic Retrograde Cholangio-Pancreatography
ESLD	: End Stage Liver Disease
FHF	: Fulminant hepatic failure
G\Kg	: Gram per Kilogram
GABA	: γ-aminobutyric acid
GFR	: Glomerular Filtration Rate
GI	: Gastrointestinal
H2	: Histamine 2 receptors
HAART	: Highly Active Antiretroviral Therapy
HAT	: Hepatic Artery Thrombosis
HBIg	: Hepatitis B Immune Globulin
HBIG	: Hepatitis B immune globulin
HB_SAg	: Hepatitis B surface Antigen
HBV	: Hepatitis B Virus
HCC	: Hepatocellular Carcinoma
HCV	: Hepatitis C virus
HE	: Hepatic Encephalopathy

LIST OF ABBREVIATIONS (Cont.)

HIV-PAH	: HIV-related pulmonary arterial hypertension
HLA	: Human Leucocyte Antigens
HMG– CoA	: 3-hydroxy-3-methylglutaryl coenzyme A
HRS	: Hepatorenal syndrome
I.U	: International Unit
ICP	: Intra Cranial Pressure
ICU	: Intensive Care Unit
IL	: Interleukin
INR	: International Normalized Ratio
IPVD	: Intrapulmonary Vascular Dilatations
IV	: Intravenous
IVC	: The inferior vena cava
LAM	: Lamivudine
LDL	: Low density lipoproteins
LDLT	: Living donor liver transplantation
LT	: Liver transplantation
mAbs	: Monoclonal Antibodies
MAP	: Mitogen-activated protein
MELD	: Model for end-stage liver disease
MEOS	: Microsomal ethanol-oxidising system
ml	: Mililiter
MMF	: Mycophenolate Mofetil

LIST OF ABBREVIATIONS (Cont.)

mosm	: Miliosmole
MPA	: Mycophenolic acid
MRI	: Magnetic Resonance Imaging
MRSA	: Methicillin Resistant Staphylococcus Aureus
mTOR	: Mammalian Target of Rapamycin
NF-κB	: Nuclear factor-kappa B
NH_3	: Ammonia
NH_4	: Ammonium
NICE	: National Institute for Clinical Excellence (UK)
NSAIDs	: Non-steroidal anti-inflammatory drugs
OLT	: Orthotropic liver transplantation
OR	: Operating room
PaO_2	: Arterial oxygen tension
PBC	: Primary biliary cirrhosis
PBMC	: Peripheral blood mononuclear cells
PCR	: Polymerase chain reaction
PCWP	: Pulmonary capillary wedge pressure
PEEP	: Positive end-expiratory pressure
PELD	: Pediatric end-stage liver disease
PNF	: Primary nonfunction
PO	: Per orum
PPHTN	: Porto-pulmonary hypertension

LIST OF ABBREVIATIONS (Cont.)

PPI	: Proton Pump Inhibitor
PVT	: Portal vein thrombosis
RBP	: Retinol-binding protein
RNA	: Ribonucleic Acid
SVR	: Systemic Vascular Resistance
T3	: Tri-iodothyronine
T4	: Thyroxin
TAC	: Tacrolimus
TG	: ThymoglobuIin
TPN	: Total Parenteral Nutrition
U/S	: Ultrasound
UK	: United Kingdom
UNOS	: United Network for Organ Sharing
US	: United States
V.C	: Vasoconstriction
V.D	: Vasodilation
VLDL	: Very low density lipoproteins
WBC	: White blood cell

INTRODUCTION

Liver transplantation is the treatment of choice for various forms of end-stage liver disease, including viral liver disease, liver malignancies, acute liver failure, and certain metabolic derangements. What is also being seen in recent years is that sicker patients are undergoing transplantation. Sicker patients before transplant translate into sicker, more complicated patients after transplant. Frequently, these patients undergo transplantation when they have comorbidities and organ dysfunction ***(Markmann et al., 2008)***.

The unique pathophysiology of patients with end-stage liver disease has important implications for their critical care treatment, particularly in the postoperative state ***(Doria et al., 2006)***. After transplantation, careful management to avoid complications and intervene early is necessary. Common postoperative complications include graft dysfunction, vascular thrombosis, biliary tract complications, infection, rejection, neurologic injury, electrolyte imbalances, and drug interactions. A multidisciplinary approach to care including the critical care nursing is necessary for successful long-term outcomes ***(Roberts, 2002)***.

The early post-operative period is a crucial time when strict monitoring and sustainment of cardiorespiratory function, frequent assessment of allograft performance, timely recog-

nition of unexpected complications and prompt treatment of extrahepatic organ system dysfunction is mandatory. Intensive care management of liver transplanted patients mainly centers on rapid hemodynamic stabilization, correction of coagulopathy, early weaning from mechanical ventilation, proper fluid administration, kidney function preservation, graft rejection prevention, and infection prophylaxis ***(Marchioro, 2002)***.

Historical Perspectives:

Today, liver transplantation is a lifesaving procedure for patients with chronic end-stage liver disease and acute liver failure (ALF) when there are no available medical and surgical treatment options. Thomas Starzl performed the first three human liver transplantation at the University of Colorado in 1963, but did not achieve 1-year survival until 1967. Over the next 15 years, relatively few liver transplantation were performed, and the 1-year survival rate was only 30% until the late 1970s and early 1980s when the implementation of cyclosporine- based immunosuppression led to doubling of the 1-year survival rate. In 1983, these improved outcomes led to the decision at a National Institutes of Health Consensus Development Conference that liver transplantation was no longer experimental procedure and deserved broader application in clinical practice. This meeting initiated the modern era of liver transplantation and resulted in the

propagation of liver transplantation across the United States and around the world ***(Groth, 2000)***.

Since the early 1980s, there have been significant advances in all aspects of liver transplantation, including recipient selection, donor management, operation technique, immunosuppression, and postoperative management of liver recipients. These changes, which have marked the evolution from an experimental technique to established and routine therapy, have resulted in enormous improvements in outcome. The overall 1-year survival for adult and pediatric deceased donor liver transplantation (DDLT) is now expected to be in excess of 85%, with 5- and 10-year survival in excess of 70% and 60%, respectively ***(Dausset, 2000)***.

The success of liver transplantation as treatment for most types of acute and chronic liver failure has led to increased referrals for transplantation in the setting of a relatively fixed supply of cadaveric donor organs. At the end of 2006, more than 17,000 patients were listed for liver transplantation in the United States. Despite performance of more than 6,000 liver transplantations annually in the United States during the past several years only one thirds of candidates received liver transplantation and almost 2,000 deaths have occurred annually in patients listed for liver transplantation during past 6 years ***(Starzl, 2002)***.