Liver Transplantation for Hepatocellular Carcinoma

An Essay

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In General Surgery

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List of Contents

List of Tables

Page

List of Figures

Page

List of Figures (Cont.)

Page

List of Figures (Cont.)

Page

List of Abbreviations

18F-FDG	18-Fluorine labeled 2 Deoxy 2D Glucose
ACE	Angiotensin converting enzyme
ACR	Acute cellular rejection
AFP	Alpha-fetoprotien
AH	Adenomatos hyperplasia
ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
AZA	Azatlioprine
CBD	Common bile duct
CDR	Chronic ductopenic rejection
CEUS	Constrast enhanced ultrasound
CMV	Cytomegalovirus
CNI	Calciniurin Inhibitor
CT	Computed Tomography
CTAP	Computed Tomography Arterial Portography
CTHA	Computed Tomography Hepatic Arteriography
DCD	Donation after cardiac death
DEXA	Dual energy x-ray absorptiometry
FNH	Focal nodular hyperplasia
GDA	Gastroduodenal artery
GGPT	Gamma glutamyl transpeptidase
GIT	Gastrointestinal tract
GRWR	Graft-to-recipient body weight ratio
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma

HCV	Hepatitis C virus

List of Abbreviations (Cont.)

ICU	Intensive care unit
IgG	Immunoglobulin G
IMV	Inferior mesenteric artery
IVC	Inferior vena cava
LDLT	Living donor liver transplantation
MELD	Model for end-stage liver disease
MMF	Mycophenolate mofetil
MRCP	Magnetic resonance cholangiopancreatography
MRI	Magnetic resonance imaging
PEEP	Positive endexpiratory pressure
PET	Positron Emission Tomography
PSC	Primary sclerosing cholangitis
PVT	Portal vein thrombosis
SMA	Superior mesenteric artery
SRL	Sirolimus
TAC	Tacrolimus
UKELD	United Kingdom model for end-stage liver disease
US	Ultrasound

INTRODUCTION

Hepatocellular carcinoma is the fifth most common cancer worldwide. It is a primary malignancy of hepatocyte, generally leading to death within 6-20 months. Hepatocellular carcinoma frequently arises in the setting of cirrhosis, appearing 20-30 years following the initial insult to the liver. However, 25% of patients have no history or risk factors for the development of cirrhosis. The extent of hepatic dysfunction limits treatment options, and as many patients die of liver failure as from tumor progression ***(Dancygier, 2010).***

Although it is currently one of the most common worldwide causes of cancer death, a major impact on the incidence of hepatocellular carcinoma should be achieved through current vaccination strategies for hepatitis B virus infection, screening and treatment for hepatitis C virus infections, and from the reduction of alcoholic liver disease. However, because the latency period from hepatic damage to hepatocellular carcinoma development is very long, it may be many years until the incidence of hepatocellular carcinoma decreases as a result of these interventions ***(Bassily et al., 2009).***

Median survival from time of diagnosis is generally 6 months. Length of survival depends largely on the extent of cirrhosis in the liver; cirrhotic patients have shorter survival

times and more limited therapeutic options; portal vein occlusion, which occurs commonly, portends an even shorter survival ***(Befeler et al., 2004).***

Complications from hepatocellular carcinoma include hepatocellular failure, cachexia, variceal bleeding, or (rarely) tumor rupture and bleeding into the peritoneum ***(Cillo et al., 2004).***

Alpha-fetoprotein is elevated in 75% of cases. The level of elevation correlates inversely with prognosis. An elevation of greater than 400ng/mL predicts for hepatocellular carcinoma with specificity greater than 95% ***(Gomaa et al., 2009).***

Ultrasonography is the least expensive choice for screening, but it is highly operator-dependent. A suspicious lesion on a sonogram generally requires additional imaging studies to confirm the diagnosis and the stage of the tumor. Computed Tomography scanning has the added benefit of detecting extra-hepatic disease, especially lymph-adenopathy. Magnetic Resonance Imaging may detect smaller lesions and can also be used to determine flow in the portal vein. The overall sensitivity of Magnetic Resonance Imaging is thought to be similar to that of triphasic Computed Tomography scanning. The study of vascular and biliary anatomy of the liver can be performed in different ways as: angiography, angio-CT, magnet resonance imaging. However, in patients

with nodular cirrhotic livers, magnetic resonance imaging has been shown to have better sensitivity and specificity ***(Bennett et al., 2002).***

Research into the possibility of liver transplantation started before the 1960s with the pivotal baseline work of Thomas Starzl in Chicago and Boston, where the initial liver transplantation techniques were researched in dogs. Starzl attempted the first human liver transplantation in 1963 in Denver, but a successful liver transplantation was not achieved until 1967 ***(Mazzaferro et al., 2008).***

Absolute contraindications to liver transplantation by most programs include: spontaneous bacterial peritonitis or other active infection, severely advanced cardiopulmonary disease, extrahepatic malignancy that does not meet cure criteria, active alcohol or substance abuse, and inability to comply with immunosuppression protocols because of psychosocial situations ***(Cormier et al., 2006).***

Medical management before transplantation is aimed at preventing and treating the complications associated with end stage liver disease. Thus, many patients take various medications to control the consequences of liver failure and portal hypertension. These complications include (but are not limited to) ascites, spontaneous bacterial peritonitis, encephalo-pathy, esophageal varices, and intense pruritus ***(Lucey, 2004).***

Living donor liver transplantation is based on two main principles: (1) donor morbidity and mortality must be kept to a minimum; and (2) graft and recipient survival should be as high as in full size from dead donor liver transplantation. In this regard, careful evaluation and selection of the donor minimizes the risk to the donor and maximizes the benefit to the recipient ***(Fan et al., 2002).***

The role of liver biopsy in donor selection remains controversial, since the procedure is associated with additional potential risks for the donor. It is believed by some that liver biopsy in donor selection for right adult Living donor liver transplantation is mandatory, once the initial donor screening and non-invasive evaluation is complete ***(Martin and Benedict, 2005).***

Technical complications include haemorrhage, Hepatic artery thrombosis, Portal vein thrombosis, Biliary leaks and biliary stenosis. The outcome after liver transplantation depends on the underlying disease; the best results are seen in patients with chronic liver disease ***(Georgiades et al., 2006).***

AIM OF THE WORK

The purpose of this essay is to focus on liver transplantation as an option for curability in hepatocellular carcinoma.