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Analysis of Outcome in Recipients with Different Graft-Recipient-Weight-Ratio (GRWR) Post Adult to Adult Living Donor Liver Transplant (LDLT)

Thesis

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List of Abbreviations

Abb.	Full term
ATP	Adenosine Triphosphate
BMI	Body mass index
BUN	Blood urea nitrogen
CBC	Complete Blood Count
CCA	Cholangiocarcinoma
CMV	Cytomegalovirus
CRP	C-reactive protein
CT	Computed tomography
DDLT	Deceased donor liver transplantation
EBV	Epstein-Barr virus
ECG	Electrocardiography
ESR	Erythrocyte sedimentation rate
GIM	Graft Inflow Modulation
GRWR	Graft to recipient weight ratio
GV/SLV	Graft volume standard liver volume ratio
HABR	Hepatic arterial buffer response
HAT	Hepatic artery thrombosis
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
HGF	Hepatocyte growth factor
HGFA	Hepatocyte growth factor activator
HIV	Human immunodeficiency virus
HPCS	Hemi-portocaval shunt
HTK	Histidine–tryptophan–ketoglutarate solution
IHPBA	International hepato-pancreaticobiliary association
INR	International normalized ratio
IVC	Inferior vena cava
LDLT	Living donor liver transplantation

List of Abbreviations Cont...

Abb.	Full term
LTx	Liver transplantation
MELD	Model of end-stage liver disease
MHV	Middle hepatic vein
MHV	Middle hepatic vein
OPSS	Overwhelming post-splenectomy sepsis
PNF	Primary non-function
PSS	Porto-systemic shunts
PT	Prothrombin time
PTT	Partial thromboplastin time
PVF	Portal venous flow
PVP	Portal vein pressure
PVT	Portal vein thrombosis
RPR	Rapid plasma reagin
SAL	Splenic artery ligation
SFSG	Small-for-size graft
SFSS	Small-for-size syndrome
SMV	Splanchnic venous inflow
VEGF	Vascular endothelial growth factor

ABSTRACT

Background: The problem of graft size is one of the critical factors limiting the expansion of adult-to-adult living donor liver transplantation (LDLT). Graft-to-recipient weight ratio (GRWR) > 0.8% is perceived as the critical graft size to meet the metabolic demand of the recipient. Small-for-size graft (SFSG) is the graft with GRWR < 0.8 and when its unable to meet the recipients metabolic demands, small-for-size syndrome (SFSS) occurs which is a life-threatening condition with rapidly progressive liver failure. This lower limit of GRWR (0.8%) has been challenged over the last decade perhaps due to better understanding of the pathophysiology, coupled with technical refinements, particularly related to venous outflow reconstruction.

Aim of Work: Our aim was to analyse the different outcomes of patients undergoing Living donor liver transplantation using grafts with GRWR ≤ 0.8% with those >0.8% to evaluate the factors that affect the post-operative outcome and the overall one year Graft survival.

Methods: This is a retrospective cohort study on 100 adult patients with ESLD or HCC (mean age 54.16 ± 10.53 years old) who underwent adult LDLT in the period between 2018 and 2020 and follow up the patients for one year post transplant, Patients were divided into two groups, patients who received Graft with GRWR ≤ 0.8 (N= 22 patients with lower limit of GRWR = 0.58 and there is 7 patients with GRWR ≤ 0.7) and those with GRWR >0.8 (N= 78 patients). We compared the the Donor factors, preoperative patient factors, intraoperative factors, development of small for size syndrome and graft survival in patients received small-for-size grafts (GRWR ≤ 0.8) with patients received GRWR <0.8.

Results: We retrospectively evaluated the donor factors, recipient factors and operative factors through the medical records. Small-for-size syndrome (SFSS) occurred in 2 of 22 patients (9.1%) in patients with GRWR ≤ 0.8 and in 1 of 78 patients (1.3%) in patients with GRWR >0.8 which was statistically insignificant between two groups. There was No significant difference in the Donor age, Preoperative MELD, CHILD, Portal hypertension, cold and warm ischemia, operative time, presence of PVT and HCC in patients who received GRWR ≤ 0.8 and patients with GRWR >0.8. the mean overall survival for all the studied cases was found 43.35 months and the overall survival at 6 months and 1 year was 96.0% but there was statistically significant increase in the overall survival of cases with GRWR >0.8 than those with GRWR ≤ 0.8 with p-value = 0.009, as the overall 6 months and 1 year survival for patients with GRWR >0.8 was 98% and 98 % compared to 86 % and 86 % in thoses with GRWR ≤ 0.8

Conclusion: There is no difference in the outcome in form of development of Small for size syndrome when we use Grafts with GRWR >0.8 or with GRWR ≤ 0.8, However the venous Outflow of SFSG (GRWR < 0.8) is very critical to maintain good graft function in the recipient.

Keywords: Living donor liver transplantation, graft-to-recipient weight ratio

INTRODUCTION

Egypt is a heavily populated country, with a strikingly high prevelance of hepatitis C virus (HCV) infection,26%. That has led to increasing numbers of Egyptian patients suffering from end-stage liver disease ***(El-Elemi and El-Gazzaz, 2010).*** Thus, liver diseases are amongst the national health problems that have a great impact on health insurance programs, national human and financial resources. Hence, the remarkable continuous growth of liver transplantation programs and the increase of the number of transplanted patients ***(Sholkamy, 2014).***

Indications for liver transplantation can be classified into end-stage liver disease, acute liver failure and certain benign and malignant liver tumors. LT should be considered for any patient in whom anticipated overall survival exceeds life expectancy of the underlying disease or where significant increase in quality of life can be achieved ***(Hackl et al., 2014).***

Living donor liver transplantation (LDLT) has been a well-recognized alternative to whole graft transplantation from deceased donor in face of organ shortage in the past two decades. Since the first successful LDLT from adult to child reported by Strong *et al*. in 1989 in Australia, the operation has been rapidly taken up by various centers ***(Miyagawa et al., 2001).***