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Case Report

For the Right Hemiliver Graft May Need Tissue Expander After Living Donor Liver Transplantation

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Abstract

Introduction: Hepatic venous outflow is an important for the graft survival in living donor liver transplantation. Hepatic venous outflow obstruction generates liver failure, which may influenced due to graft malposition, which unsized upper part of abdomen between donor and recipient. The number of Liver Transplantation (LT) increases last few years, which is related with populating the high surgical technology in developing country like in Mongolia. The main reason of LT is a hepatitis B virus-related liver cirrhosis in Mongolia. Liver transplantation had started since 2011 under the supporting of Professor Sung Gyu Lee from hepato-biliary surgery and liver transplantation of ASAN Medical Center. Veno-Occlusive Disease (VOD), Budd-Chiari Syndrome (BCS), and Congestive Hepatopathy (CH), all of which results in hepatic venous outflow obstruction. The early Hepatic Venous Outflow Obstruction (HVOO) is a rare, however that could raise a serious complication as a graft failure and eventual lose. We report a case of early HVOO, which may result of size mismatch of abdominal cavity. The size mismatch of abdominal cavity may produce kinking syndrome after transplantation of right lobe, which reveals the HVOO without anastomosis complication. Methods: A 38-year-old male patient with liver cirrhosis due to HBV, HDV, HCC in S8 of the liver (CTP-B, MELD-18). On the first postoperative day the patient developed impairment of the liver function. Doppler ultrasound (US) showed the different speed of RHV preanastomosis and postanastomosis field. This was diagnosed acute liver failure due to veno-oclusive disease, after that started intensive therapy.

Result: Kinking or twisting of the venous anastomosis is related with anatomical mismatch between the graft and the recipient abdomen, even though transplanted the right hemiliver graft. HVOO results acute cellular rejection, which treated by pulse therapy. However, it should be managed by surgically, put the tissue expander.

Conclusion: Doppler ultrasonography is one of the best choices to evaluate postoperative vascular complications in liver transplantation. The right hemiliver graft needs tissue expander for mismatching between the graft and recipient abdomen.

Introduction

Living donor liver transplantation has become the treatment of choice for patients with end-stage acute or chronic hepatic disease in developing country like Mongolia. Still vascular complication is one of the serious complications of liver transplantation, which leads postoperation graft failure [1]. Vascular complication was ranging from 8% to 15% among transplantation centers after liver transplantation. The rate could be high in split LT or LDLT [2-5]. Size mismatch of abdominal cavity is a rare for living donor liver transplantation, however it offers numerous disadvantages after transplantation. A few studies have suggested that mismatch for size of liver, but there had not reported the size mismatch of abdominal cavity, which directs Budd-Chiari Syndrome (BCS). Although studies from India mentioned that the most common site of obstruction is combined hepatic vein and inferior vein cava (56-58%), only IVC obstruction was reported in 14-50% cases of HVOO [6-9].

Researchers reported incidences of Hepatic Venous Outflow Obstruction (HVOO) after living donor liver transplantation are 3.9-16.6% [10-13]. In LDLT recipients, HVOO is becoming a reason of liver function deterioration, graft failure, or even death resulting from the small

size of the graft [14,15]. Right hepatic vein obtained insufficient for reconstruction during the LDLT, which provides development of HVOO [13,16]. HVOO occurs in the early postoperative period (≤28 days) are caused by technical factors such as a tight suture line, donor-recipient size discrepancy, kinking of a redundant hepatic vein, and caval compression from a large graft [12,17]. Clinical symptoms of HVOO are non-specific, however could be abnormal liver function, hepatomegaly, ascites, pleural effusion, and lower-extremity edema [10,13,18]. BCS is an uncommon disorder characterized by obstruction of hepatic venous outflow and considered primary or secondary depending on the origin of the obstructive lesion. The obstruction cause could be thrombotic or non-thrombotic, that size mismatch of abdomen is a reason of kinking syndrome.

Case

The patient is 38 years old, man diagnosed HBV+HDV related LC, HCC on S8, CTP-B, MELD score 18. He underwent living donor liver transplantation operation using a right lobe graft from younger sister. The recipient's body weight is an 84kg, height 172cm, body mass index 28.4, body surface area 2m2. The donor's body weight is 58kg, height 153cm, body mass index 24.8, body surface area 1.6m2. The operation time was continued 15hours 34 minutes, the cold is 85 minutes and warm ischemic is 55 minutes. There were directly increased some laboratory tests postoperation day 1, serum total bilirubin 3.77mg/dl, alanine transaminase (ALT) 657.32 (IU/L), Aspartate Transaminase (AST) 458.89 (IU/L), Gamma Glutamyl Transpeptinase (GGT) 21.42 (IU/L), and LD 585.87 (IU/L). POD 2 showed the increased serum total bilirubin 3.81mg/dl, Alanine Transaminase (ALT) 2866.32 (IU/L), Aspartate Transaminase (AST) 2306.3(IU/L), Gamma Glutamyl Transpeptinase (GGT) 37.14 (IU/L), and LD 1894.77 (IU/L). Ultrasonography showed different outflow speed in the anastomosis area of right hepatic vein (38.58cm/s) and in the middle area of RHV (68.04cm/s), which expected the kinking syndrome in POD2 (Figure 1). CT with contrast showed right hepatic vein stenosis (Figure2A & 2B). Venography showed pre-stenotic pressure of RHV-20mmHg, and IVC-7mmHg (Figure 3). After stenting the outflow was reestablished and intra hepatic venous pressure was decreased to 7mmHg, which was shown in Figure 4A & 4B. Hepatic venous pressure gradient was decreased from 13mmHg to 1-2mmHg.

Figure 1.

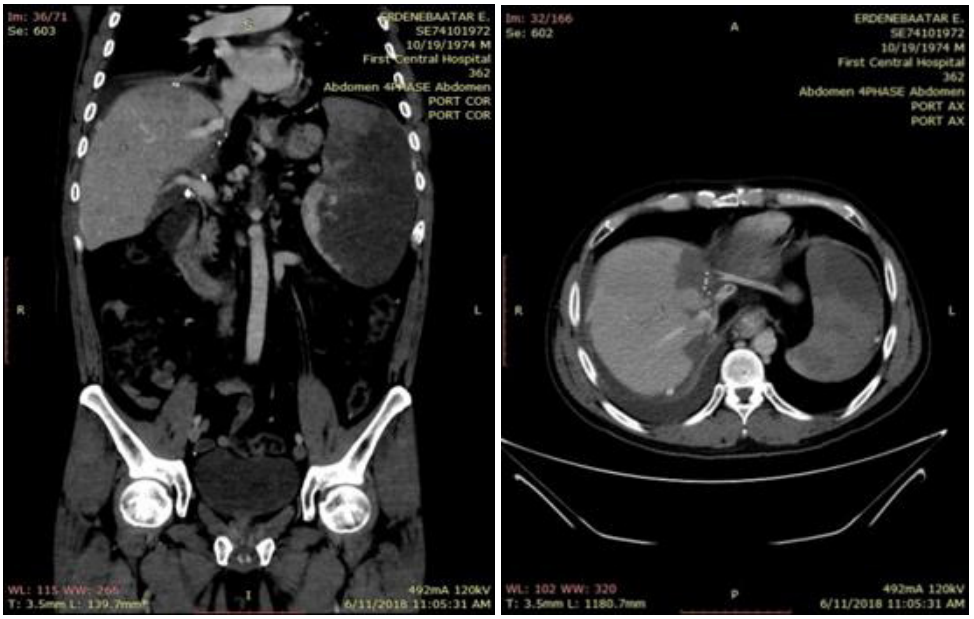

Figure 2A & 2B.

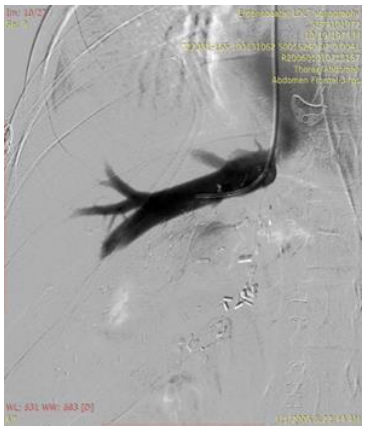

Figure 3.

Figure 4A & 4B.

Discussion

Doppler Ultrasound (US) is widely used for the controlling patients and checking inflow or outflow of liver after transplantation. Hwang et al. reported that Doppler ultrasound for the diagnosis of main hepatic vein tributary obstruction and inferior RHV obstruction was more sensitive and accurate than CT (97% vs 39%), however less specific (67% vs 100%) [19]. Computed Tomography (CT) is commonly used in controversial clinical patients. CT's sensitive is a (97% vs. 87%) and specificity (86% vs. 68%), that results are better than Doppler US, which could suggest venous congestion [20]. Pressure gradients have a main role in diagnosis of HVOO after liver transplantation, that across the stenosis between the distal hepatic vein and the right atrium that was > 5mmHg [21]. A pressure gradient is a >5-6mmHg, which is commonly accepted as a threshold of HVOO.

Radiological dilatation and stenting are a successful management for HVOO for the majority patients. The incidence of HVOO after liver transplantation varies from 5% to 9.5%, from that whole liver transplantation has low percentage of the incidence. The highest percentage of HVOO had faced with pediatric and living donor, split liver transplantation. Early causes of HVOO are twisting or kinking at the anastomosis as a result of rotation of the graft because of the lack of adhesions in the early post-operative period. There are other early causes include a tight anastomosis, thrombosis and compression of anastomosis as a result of graft swelling or haematoma. The late causes include neointimal hyperplasia and fibrosis structuring at the anastomosis [22].

Conclusion

Doppler ultrasonography is one of the best choices to evaluate postoperative vascular complications in liver transplantation. The right hemiliver graft needs tissue expander for mismatching between the graft and recipient abdomen.

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