



Complications Analysis of Polytetrafluoroethylene Grafts Used for Middle Hepatic Vein Reconstruction in Living-Donor Liver Transplantation

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ABSTRACT

Background. We previously showed that ringed polytetrafluoroethylene (PTFE) grafts combined with small allograft patches showed high patency rates similar to those of iliac vein grafts and therefore that they can be used for middle hepatic vein (MHV) reconstruction. Although such use of PTFE graft showed high patency rates, its long-term safety regarding infection and other types of complications were not presented. In this study, we investigated the actual risk of complications directly associated with PTFE graft interposition for MHV reconstruction.

Methods. During the study period of 30 months, we performed 215 cases of adult living-donor liver transplantation with modified right lobe graft and PTFE grafts. We classified the potential complications directly associated with PTFE graft interposition as infectious and surgical complications. The medical records of study patients were retrospectively reviewed.

Results. MHV graft patency rate was 76.3% at 6 months and 36.7% at 12 months. Their 1-year graft and patient survival rates were 92.6% and 93.5%, respectively. The 1-year actual incidences of infectious complication and surgical complication were near zero and 1 case (0.5%), respectively. In 1 recipient, the PTFE graft penetrated into the stomach wall 6 months after transplantation, but the patient did not complain of any specific symptoms. The PTFE graft was removed with the use of laparotomy, and the patient recovered uneventfully.

Conclusions. Although the incidence of PTFE graft-associated complication rate is very low, we suggest that it is necessary to closely monitor the PTFE graft, because unexpected complications can happen during long-term follow-up.

MIDDLE HEPATIC VEIN (MHV) reconstruction with an interposition vessel graft has been established as a standard procedure for living-donor liver transplantation (LDLT) using a right lobe graft when the donor's MHV trunk is preserved in the donor's remnant liver. Large-size vein allografts are suitable for MHV reconstruction, but their supply is often limited. Because of easy availability of synthetic grafts, polytetrafluoroethylene (PTFE) grafts have been used instead of sizable vessel allografts [1–3]. We have previously shown that acceptably high patency rates were achieved after technical refinement with the use of ringed PTFE grafts combined with small vessel patches [1]. Although such use of PTFE graft showed

high patency rates, its long-term safety regarding infection and other types of complications has not been studied yet.

In this study, we investigated the actual risk of complications directly associated with PTFE graft interposition for MHV reconstruction during LDLT.

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Table 1. Clinical Profiles of the 215 Patients Who Underwent Living-Donor Liver Transplantation Using a Modified Right Lobe Graft With Polytetrafluoroethylene Graft Interposition

Parameter	Value
Recipient age (y)	52.8 ± 4.9
Recipient sex: male/female (n/n)	145/70
Primary diagnosis (n)	
Hepatitis B virus-associated liver cirrhosis	139
Hepatitis C virus-associated liver cirrhosis	18
Alcoholic liver disease	32
Acute liver failure	15
Other	11
Concurrent hepatocellular carcinoma (n)	116 (51.6%)
MELD score	17.1 ± 8.7
Donor age (y)	27.3 ± 7.3
Donor sex: male/female (n/n)	165/50
ABO blood group incompatibility (n)	34 (15.8%)
GRWR	1.07 ± 0.3
6-month MHV graft patency rate	76.3%
1-year MHV graft patency rate	36.7%
1-year liver graft survival rate	92.6%
1-year patient survival rate	93.5%

Abbreviations: MELD, Model for End-Stage Liver Disease; GRWR, graft-recipient weight ratio; MHV, middle hepatic vein.

PATIENTS AND METHODS

During a study period of 30 months from March 2010 to August 2012, we performed 215 cases of adult LDLT with the use of a modified right lobe graft and PTFE grafts [1,4]. The clinical profiles are summarized in Table 1.

During the LDLT operation, we used ringed PTFE grafts (Gore-Tex) of an internal diameter of 10 mm. After we inserted a niche to enlarge the orifices of hepatic vein branch segments 5 and 8, we applied an intervening allograft patch for end-to-side anastomosis

of MHV branches. After graft implantation, we diffusely sprayed fibrin glue over the PTFE graft with expectation of infection protection through sealing the microporous structure of the grafts against potential infection risks such as bile leaks. Detailed surgical technique was described previously [1].

The LDLT recipients were closely monitored according to institutional follow-up guidelines. During the 1st year after discharge from initial hospitalization, abdomen computerized tomography was performed with 2–4-month intervals to detect sub-clinical complications and hepatocellular carcinoma recurrence [5,6].

In the present study, we classified the potential complications directly associated with PTFE graft interposition as infectious or surgical complications. Infectious complications included abscess formation around PTFE graft, requiring percutaneous drainage or PTFE graft removal. Surgical complications included bleeding and PTFE graft migration requiring any type of intervention.

The medical records of study patients were retrospectively reviewed in August 2013; thus the minimal follow-up period was set to be 1 year. The present study protocol was approved by the Institutional Review Board of our institution.

RESULTS

Survival Outcome and MHV Patency

In this study cohort of 215 patients, the MHV graft patency rate was 76.3% at 6 months and 36.7% at 12 months. The 1-year liver graft survival rate was 92.6%, and 2 of 3 patients who underwent retransplantation survived, making the 1-year patient survival rate 93.5% (Table 1).

Incidence of PTFE Graft-Associated Complications

Fluid collection and hematoma around the graft liver surface was occasionally detected, but no patient required

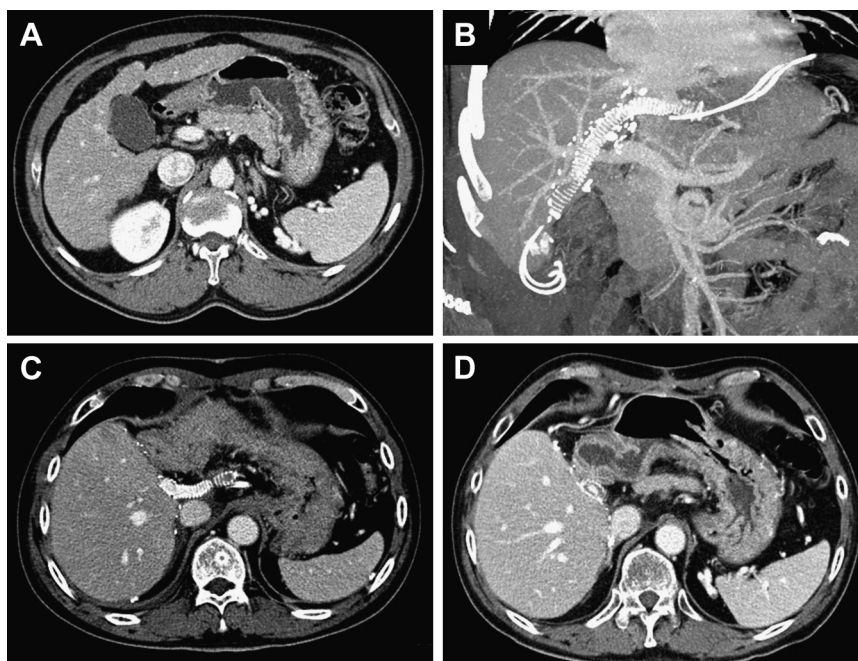


Fig 1. Computerized tomographic (CT) follow-up before PTFE graft migration. Native cirrhotic liver (A) was removed and a right liver graft implanted. Follow-up CT images showed patent PTFE graft of middle hepatic vein reconstruction at post-transplantation 1 week (B and C) and 3 months (D).

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