Classification of intrahepatic biliary strictures and assessment of outcome in living donor liver transplantation

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Background: Biliary complications account for unsolved common complications after living donor liver transplantation (LDLT). However, intrahepatic biliary stricture (IHBS) after LDLT is not common but requires intensive care. The purpose of this study is to classify IHBS and to evaluate the prognosis of IHBS after LDLT.

Methods: From 2011 to 2018, 868 cases of the right liver LDLT were enrolled. According to cholangiographic appearance, types of biliary stricture were classified into four, based on level and number of involved branches: type 1 (anastomosis or the 1st order branch; single), type 2 (the 2nd order branch; a. single, b. double, c. extended to the 3rd order branch), type 3 (multifocal), type 4 (diffuse necrosis). IHBS was defined as type 2, 3 and 4. We evaluated biliary intervention free period more than 1 year after last intervention (IFY), intervention frequency per year and clinical relapse after IFY.

Results: The overall incidence of biliary stricture including IHBS was 23% (n=198); IHBS was 9% (n=76). The most common type of stricture was type 1 (n=122, 62%) followed by type 2 (n=66, 33%), 3 (n=6, 3%) and 4 (n=4, 2%). Incidence of type 2 sub-classification consisted of 2a (n=8, 4%), 2b (n=15, 8%), 2c (n=43, 22%). IFY was more common in type 1 (85%) and 2 (a, 88%; b, 87%; c, 72%) than type 3 (67%) and 4 (25%) (P<0.05). Intervention frequency per year was higher in type 4 (12) than others (type 1, 3; type 2a, 2; type 2b, 4; type 2c, 5; type 3, 7) (P<0.05). Clinical relapse after IFY was more common in type 4 (50%) and 3 (67%) than type 2 (33%) and 1 (37%) but it was not significantly different (P>0.05).

Conclusions: IHBS was not rare in right liver LDLT. Although multifocal stricture or diffuse necrosis of intrahepatic bile duct were uncommon, they required more interventions.

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