incidence, risk factors and outcomes after liver transplantation: Low-volume transplant center experience

Jamilya Saparbay[1,2] ,Zhanat Spatayev[2] ,Abylaykhan Sharmenov[2],Chokhan Aytbayev[2], Assylmurat Zhumukov[2], Asan Zhexembayev[2],Adilbek Mukazazhanov[2]

Introduction : Liver transplantation program started in National Research Medical Center (NROC), Astana, Kazakhstan in 2013. It took a decade to establish current surgical and post LTx methodology. Since LTx program inception biliary complications were the most complicated for management and require multidisciplinary team and commonly recovery is quite extensive.

Patients and methods : This retrospective study analyzed incidence of biliary complications after living/deceased liver transplantation, performed in NROC between 2013 and 2023.

Results: LTx from living donors were performed 61 cases (76.3%),in 19 cases (23.8%) liver grafts were received from deceased donors. The majority of LTx were ABO compatible (97,5%). Out of 61 cases of LDLT, right liver grafts were harvested, in 5 cases left liver lobe; and 1 left lateral was transplanted. Biliary tract reconstruction was performed with duct-to-duct anastomosis (DDA) in 64 cases(80%) and hepaticojejunostomy (HJ) in 16 cases (20%). A single DDA was performed in 70 patients; double DDA in 9 patients and triple DDA in 1 case. Bile duct diameter of harvested graft in 55 patients was more than 4 mm and less than 4 mm in 25 patients. Unification of multiple bile ducts was performed in 16 patients. Overall incidence of bile leakage in our study was 32,5%. Re-operation required in 3(3.8%)patients after bile leak was diagnosed. Anastomotic stricture occurred in 17 patients (21.2%). Hepatic artery complications, such as anastomotic thrombosis with consequent hepatic artery stenosis was detected in 20 patients (25,3%).Draining tube across biliary anastomosis(EBD) fixed with absorbable sutures and percutaneous placement on the skin was performed in 40(57,2%) recipients out of 70. Anastomotic stricture occurred more frequently in the group were bile leak developed after LTx and comprised 9 patients (53%),p value=0.043.Bile leakage incidence was significantly dependent on bile duct anastomosis number, bile leak happened in 19 patients, where single DDA was performed and in 7 cases were more than one DDA was done, p value-0.007.Overall survival was analyzed in group with and without EBD group,1,3,5 year survival was 83% for all years and 73% in non-EBD and EBD group respectively, showing no statistical difference (p value-0.39). HAT occurrence was significantly associated with the death of the recipient, p value- 0.0000.

Conclusion: We found that BCs comprised the most frequent complication in our case series. Bile leakage was significantly associated with AS development, moreover AS occurred more frequently in EBD group. Limitation of our study included small patient number. However, placement of EBD appears to be a good choice for AS prevention.

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	non EBD group	EBD group	p value
Age(Y)mean(STDV)	42,7(12)	43,3(9)	0.810
Gender(N) (female/male)	15/15	20/20	1.000
MELD			
MELD (<20)	21(40%)	32(60%)	0.334
MELD (>20)	9 (53%)	8(47%)	
Bile leakage			
no	20(67%)	28(70%)	**0.043**
yes	10(33%)	12(30%)	
AS			
no	21(37%)	35(63%)	0.070

	Bile leak		p value
AS	no	yes	
yes	8(47%)	9(53%)	
no	46(73%)	17(27%)	**0.043**
HAT			
no	43(73%)	16(27%)	
yes	11(55%)	9(45%)	0.137
Ductoplasty			
no	45(70.3%)	19(30%)	0.283
yes	9(56%)	7(44%)	
BDA number			
double	3(30%)	7(70%)	**0.007**
single	51(73%)	19(27%)	
Duct size<4 mm			

	Anastomotic stricture		p value
	no	yes	
Age Y mean(stdv)	44(10.7)	47(10.4)	0.194
Gender (N) female/male	38/25	5/12	**0.023**
LDLT/DDLT	45/18	16/1	0.051
DDA number(single/double/triple)	55/8/0	15.01.2001	0.119
Duct size			
less than 4 mm	19	6	
more than 4 mm	44	11	0.685
Ductoplasty			
no	50	14	
yes	13	3	0.785
HAT			