The indocyanine green retention rate at 15 minutes (ICG R15) is a commonly used functional liver reserve test and an important criterion for major hepatectomy.

Some authors reported that the allowable hepatic resection rate (ARR) was determined preoperatively in each patient with a logarithm graph based on the ICGR15.

Sometime, living liver donor with ICG R15 > 20% could be performed right hepatectomy. We investigated clinicopathologic features of high ICG group (R15 > 20%) compared with low ICG (R15 ≤ 20%) group.

Methods

-From January 2006 to December 2015, seventeen high ICG group (R15>20%) had been performed right hepatectomy for living liver donor in our center.

-We compared high ICG group (20.127~ 80.478%, mean: 45.78±25.42%) (n=17) with low ICG group (1.126%~17.689%, mean: 8.19 ±3.127) (n=272), who had been performed right hepatectomy for living donor from January 2014 to December 2014, for laboratory test, pathologic features, postoperative prognosis, and other factors using by Chi-square, student t-test and linear regression test.

Results

In analysis of donor group, there were statistical difference in total bilirubin (mg/dl) 0.68 ±0.31 vs 0.92 ±0.35 (p=0.002), direct bilirubin (mg/dl) 0.25 ±0.10 vs 0.30 ±0.14 (p=0.037), and time of operation (min) 395.81 ±68.17 vs 454.71 ±62.48 (p=0.001).

The operative time in high ICG group was prolonged because the recipient operations were started after pathologic confirmation of intraoperative donor biopsy. Then time of donor graft was delayed.

Conclusions

-At times, high ICG (R15 > 20%) level is detected in preoperative examination of living liver donor for right hepatectomy.

-However there were statistical difference in total bilirubin (mg/dl) 0.68 ±0.31 vs 0.92 ±0.35 (p=0.002), direct bilirubin (mg/dl) 0.25 ±0.10 vs 0.30 ±0.14 (p=0.037), and time of operation (min) 395.81 ±68.17 vs 454.71 ±62.48 (p=0.001).

-In both groups, mortality rates of donor were zero.

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-There are no statistical difference in recipient group; mean age was 53.20 ±0.85 vs 50.41 ±8.25 (p=0.190).

-Sex, BMI, DM, primary diseases of liver cirrhosis, model for end-stage liver disease (MELD) score, Child-Turcotte-Pugh (CTP) score, presence of hepatoma, fulminant hepatic failure, emergent operation, graft type, ABO compatiable, transfusion of RBC during operation, cold ischemic time, warm ischemic time, total ischemic time and time of operation were no statistical difference in both groups (p>0.05).

-Hypertension is only different between both groups (p=0.043).

Table 1. Clinicopathologic features of adult living liver transplantation recipients according to indocyanine green retention rate at 15 minutes.

Table 2. Clinicopathologic features of adult living liver transplantation donors according to indocyanine green retention rate at 15 minutes.

References


Background

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- Some authors reported that the allowable hepatic resection rate (ARR) was determined preoperatively in each patient with a logarithm graph based on the ICGR15.

- Sometime, living liver donor with ICG R15 > 20% could be performed right hepatectomy. We investigated clinicopathologic features of high ICG group (R15 > 20%) compared with low ICG (R15 ≤ 20%) group.

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Figure 1. Scatter plots of Scatter plot showing the correlation between the ICG R15 and total bilirubin (TB) (A), direct bilirubin (DB) (B). ROC curves of TB to high ICG R15 (C).

Conclusions

- At times, high ICG (R15 > 20%) level is detected in preoperative examination of living liver donor for right hepatectomy.

- But ICG R15 value itself cannot be single determinant for major hepatectomy of donor.

- Increased total bilirubin (cut off value: 0.75, sensitivity:65.8%, specificity:64.7%) and direct bilirubin can be associated with high ICG R15 test.