

sequencing covering 72 significantly mutated genes (SMGs) associated with HCC, spanning 285,470 nucleotides.

Results: Genomic analysis in all HCCs revealed frequent genetic mutations in TERT promoter, TP53, CTNNB1, ALB, ARID1A. In multinodular HCC, MC was identified in 3 cases without common genetic alterations, while IM was diagnosed in 9 cases with at least one common mutation. In IM cases, 5 cases possessed only TERT promoter as a sole common mutation regardless of tumor size, while multiple common alterations were detected in others. In one IM case, all 3 nodules harbored 3 common oncogenic mutations including TP53 and NFE2L2. As for postoperative recurrence, MC cases had longer recurrence-free survival (RFS). IM cases harboring TERT promoter as a sole common mutation had better RFS compared to other IM cases. Meanwhile, very early multiple intrahepatic recurrence was detected in an IM case with multiple common oncogenic mutations.

Conclusion: Genomic analysis in multinodular HCCs can possibly stratify patients at risk for early postoperative recurrence. Patients with multiple common oncogenic mutations in all HCC nodules are at high risk of aggressive recurrence, implying requirement of intensive additional treatment such as with TKIs.

Abstract #316

Serum miRNA-320 as a potent diagnostic biomarker for human hepatocellular carcinoma irrespective of etiology

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Introduction: Hepatocellular carcinoma (HCC) is one of the leading causes of cancer death worldwide. MicroRNAs (miRNAs) play a pivotal role in the pathogenesis and progression of HCC.

Objectives: The present study was designed to identify a markedly downregulated circulating miRNA to diagnosis HCC irrespective of etiology.

Methods: Over 20 miRNAs with expected aberrant expression were screened in around 100 serum samples from HCC patients with different etiology along with healthy controls. The total miRNAs were isolated using Qiagen miRNeasy kit. About 200 nanogram of isolated total miRNA was hybridized with respective oligo for a particular miRNA in 96-well plates and the hybridized product with a biotinylated tag is detected using chemiluminescence technique as counts, which is a very sensitive and specific method to quantify miRNAs.

Results: The microarray data demonstrated that miRNA-320 is dramatically downregulated in all the serum samples from HCC patients irrespective of etiology. About 8–10 fold reduction ($P < 0.0001$) was observed in the serum levels of miRNA-320 compared to healthy controls. There was no significant difference in the mean miRNA-320 levels in serum samples between HCC patients with different etiology such as alcoholic liver cirrhosis, liver cirrhosis due to other reasons, chronic hepatitis due to hepatitis C virus (HCV) and HCC developed from other unknown causes.

Conclusion: The results of the present study demonstrated that there is a remarkable reduction in the serum levels of miRNA-320 in all

HCC patients irrespective of etiology. Therefore, the circulating miRNA-320 could be used as a diagnostic biomarker for HCC along with other clinical parameters.

Abstract #345

Impact of laparoscopic liver resection for hepatocellular carcinoma on the development of postoperative complication

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Aim: This study was aimed to compare the postoperative complication rate between laparoscopic and open liver resection.

Methods: From January 2008 to June 2018, 384 patients underwent curative liver resection for hepatocellular carcinoma (HCC) within 5 cm in size without macroscopic vascular invasion. The subjects were 321 patients who underwent limited resection or segmentectomy. Of these, laparoscopic liver resection was adopted in 191 patients (Lap group) and open liver resection was done in 130 patients (Open group). Propensity score matching (PSM) was conducted to adjust potentially confounding factors. Postoperative complication rate (Clavien-Dindo classification ≥ 2) were compared between Lap and Open groups after PSM. In addition, subgroup analysis was performed between subphrenic HCC (segment 7, 8) and non-subphrenic HCC subgroups.

Results: After PSM, the study group of 206 patients were well matched. Postoperative complications (27.2% vs. 7.8%, $p < 0.001$), abdominal abscess (7.8% vs. 1%, $p = 0.035$), bile leakage (5.8% vs. 0%, $p = 0.029$) were more frequently observed in Open group than Lap group. The blood loss volume was significantly lower in Lap group than Open group (100 ml vs. 355 ml, $p < 0.001$), and the length of hospital stay was significantly shorter in Lap group (9 days vs. 13 days, $p < 0.001$). In the subgroup analysis, among subphrenic HCC patients, abdominal abscess (14.6% vs. 0%, $p = 0.012$) were more frequently observed in Open group than Lap group, whereas among non-subphrenic HCC patients, no statistical significance was confirmed between the both group.

Conclusions: Compared to open liver resection, laparoscopic liver resection might reduce the development of postoperative abdominal abscess, especially for subphrenic HCC.

Abstract #528

Post-treatments of lenvatinib in patients with advanced hepatocellular carcinoma

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Introduction: Lenvatinib has been the second frontline systemic therapy for patients with advanced hepatocellular carcinoma (HCC) in Japan. However, post-treatments of lenvatinib have not been standardized yet.