**0-066**

**Stereotactic radiosurgery using cyberknife for the patients with primary hepatocellular carcinoma**

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**Background:** Radiotherapy, as a therapeutic option, has a limited role for the treatment of HCC, but, cyberknife is a newly developed hypofractionated stereotactic body radiation therapy (SBRT). The objective of this retrospective study was to evaluate the efficacy of cyberknife compared with conventional radiotherapy for the patients with advanced HCC.

**Methods:** We retrospectively reviewed the medical records of patients with HCC who were treated with cyberknife and conventional radiotherapy from January 2007 to March 2011 at Konyang University Hospital. A total of 114 patients were analyzed: receiving cyberknife (n=77) and receiving conventional radiotherapy (n=37). These two groups were compared according to various clinical features.

**Results:** 77 patients with HCC were treated with cyberknife and 37 patients were treated with conventional radiotherapy. Among the two groups, there were no significant differences in age, sex, tumor stage (modified UICC), MELD score, and previous treatment modalities (eg. TACE, RFA and operation). But, significant differences in ECOG, Child class between two groups (p=0.001 and .032). Overall actual survival at 3 years was 14.29% (11/77) and 16.23% (6/37) and no significant differences between two groups(p=.091) (ITT analysis).

**Conclusions:** Cyberknife and conventional radiotherapy for HCC has no significant differences in survival despite of better ECOG and Child class in the cyberknife group. Further studies are needed to define the role of cyberknife in the management of primary HCC.

**Keywords:** Cyberknife, Radiotherapy, Hepatocellular carcinoma

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**0-067**

**Helical tomotherapy allows higher dose to spine oligometastasis from intrahepatic malignancies and improves local control**

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**Purpose:** Palliative RT of 30 Gy in 10 fractions to spine metastases often results in poor local control. This study evaluated the role of high dose helical tomotherapy (HT) to improve local control of spine oligometastasis from intrahepatic malignancies.

**Methods and material:** From 2006 to 2010, 11 hepatocellular carcinoma (HCC) patients and 3 intrahepatic cholangiocellular carcinoma patients were treated with HT for oligometastasis to spine. The gross tumor volume (GTV) was the tumor evident from MRI images fused with simulation CT images. Planning target volume (PTV) encompassed involved vertebral body or 1cm margin to GTV. The spinal cord contour represented a small area within the intradural space. To the adjacent spinal cord volume, 20 Gy dose constraint was used. Mega-voltage computed tomography images were used to maintain setup error within 1 mm. We assessed local control rate after HT for spine metastasis in this retrospective study. Pain response was scored by using a numerical rating scale (from 0 to 10).

**Results:** Spine metastatic lesions were treated with median dose of 40 Gy (range 31.51 Gy) and median 5 Gy per fraction (range 3.6 Gy) to GTV and median dose of 29 Gy (range 22.5-42.5 Gy) and median 3.75 Gy per fraction (range 2.5-5 Gy) to PTV. Median biologically equivalent dose (BED, α/β=10 Gy) was 55.2 Gy (range 45.6-76.8) to GTV. Infield failure rate was 35.7% and outofield failure rate was 78.6%. Ten patients initially accompanied pain with spine metastasis (median NPIS 7.5), and all patients showed pain relief after tomotherapy. Complete relief was shown in 20% of patients and partial relief in 80 % of patients, with median NPIS reduction of 5. The patients treated with BED (α/β=10 Gy) over 56 Gy had no local failure. Median local recurrence free survival (LRFS) was 3 months. In the univariate analysis, BED (α/β=10 Gy) over 56 Gy was a prognostic factor associated with improved LRFS (p=0.008).

**Conclusion:** HT was capable of delivering higher BED to metastatic lesions in close proximity of the spinal cord. Spine metastases from intrahepatic tumors were sensitive to high dose radiation, and BED (α/β=10 Gy) higher than 56 Gy could improve local control.

**Keywords:** Oligometastasis, Helical tomotherapy, Hepatocellular carcinoma

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**0-068**

**The retrospective cohort study on radiotherapy group compared with only palliative care group in patients with advanced hepatocellular carcinoma**

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**Background:** Various forms of therapy have been tried for advanced hepatocellular carcinoma(HCC). Nowadays, for advanced unresectable HCC, radiotherapy has been used alone or in combination with other treatment modalities such as transarterial chemoembolization because it’s side effects has been reduced with technical improvement. This study was conducted to investigate the efficacy of radiotherapy (RT) and combined RT with other modalities compared with palliative care only for treatment of advanced HCC.
Methods: From 2001 to 2009, eighty five patients with advanced HCC. Seventy four patients were liver cirrhosis. The fifty patients with BCLC stage 3 and thirty five patients with BCLC stage 4 were enrolled. Patients with portal vein thrombosis were fifty seven. We investigate each patients' Child-Pugh class, ECOG performance, serum level of alpha fetoprotein and other baseline characteristics thought to be predictive values for prognosis of HCC. We selected thirty five patients who received RT. Fifty patients received with only palliative care were selected for control. Comparison analysis of baseline characteristics between the two groups was conducted. And survival analysis between the two group was done to investigate the efficacy of RT comparing to palliative care. And we analyzed predictive factors affecting the survival of HCC patients.

Results: In survival analysis, mean survival of total patients group was 19.4 months and 41.9 months in RT group, 3.6 months in palliative care group, respectively. In the univariate analysis total patients, ECOG performance, Child-Pugh’s class, tumor size, type of tumor, alpha fetoprotein, presence of portal vein thrombosis, TACE, RT, operation were significantly affecting survival ($p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$, $p=0.001$, $p=0.043$, $p=0.001$, $p=0.001$, $p=0.011$, respectively). In the univariate analysis for the subset analysis of the thirty five patients treated with radiotherapy, alpha fetoprotein, alcohol drinking were significantly affecting survival ($p<0.001$, $p=0.039$, respectively). In multivariate Cox regression analysis, the higher serum level of alpha fetoprotein and presence of portal vein thrombosis, not doing radiotherapy, poor Child-Pugh’s class (B,C) were independent predictors of worse overall survival in patients with advanced hepatocellular carcinoma.

Conclusions: According to our study, in patients with advanced hepatocellular carcinoma, radiotherapy has a better survival benefit compared with palliative care. Therefore, if possible, it is good to try radiotherapy as a palliative treatment in patients with advanced hepatocellular carcinoma patients. Of course, this step followed by consideration of the tumor factors as well as efforts to improve the general condition of the patient.

Keywords: Hepatocellular carcinoma (HCC), Radiotherapy (RT)

0-069
Postoperative and preoperative recurrence-prediction models for the resected hepatocellular carcinoma

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Background: Accurate recurrence-prediction after resection is most valuable for prediction of prognosis as well as selection of treatment modality. The aim of this study is to present the practical postoperative and preoperative recurrence-prediction models.

Methods: We enrolled the 533 patients of HCC with age over 20 years and follow-up over 2 years. Survival was calculated by Kaplan-Meier method and prognostic factor analysis for recurrence was done by Cox Proportional Hazard Regression Model. P-value less than 0.1 were considered statistically significant. With the significant factors for recurrence, we made the postoperative recurrence-prediction model for probability of recurrence within 5-years after resection. Then we did the Test of Independency to know the dependency of preoperative factors with postoperative pathologic factors. Finally we made the preoperative recurrence-prediction model for probability of recurrence within 5-years after resection with preoperatively predictable factors.

Results: One-year/3-year/5-year disease-free survival rates were 68%/ 49%/37% respectively. With the uni- and multivariate analysis for recurrence, satellite nodule(+) microvascular invasion(+), resection margin(+), platelet < 0K, number ≥ 3, major vessel invasion(+), tumor necrosis > 10%, GPT > 40 IU, AFP>12 ng/mL were independent significant factors for recurrence. With these 9 factors, we made the postoperative recurrence-prediction model within 5-years and the C-performance scale of this model was 0.749. Though tumor size > 5 cm and presence of viral hepatitis were significant in only univariate analysis, since they have so strong dependency with significant pathologic factors such as satellite nodule(+) and microvascular invasion, we made the preoperative recurrence-prediction model with 7 preoperatively predictable factors (platelet < 80 K, number ≥ 3, major vessel invasion(+), GPT > 40 IU, AFP > 12 ng/mL, tumor size > 5 cm, presence of viral hepatitis) and the C-performance scale of this model was 0.708.

Conclusions: Postoperative recurrence-prediction model is helpful for predicting accurate prognosis and selecting adjuvant therapy and preoperative recurrence-prediction model is useful for selection the treatment modality.

Keywords: Recurrence, prognosis prediction, hepatocellular carcinoma

0-070
Recurrent post-transplant HBV can be cleared up under combination therapy with hepatitis B immunoglobulin and nucleoside analogues

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Background: Currently, no treatment guidelines are available for post- transplant HBV recurrence. The aim of this study was to evaluate the safety and efficacy of a combination therapy of