with 5-fluorouracil protracted venous infusion (300 mg/m^2/day, 5 days/7, during 5 consecutive weeks) and Cisplatinum (20 mg/m^2/day, D1–5 and D 29–33), followed by a complete restaging evaluation 3–4 weeks after chemoradiation. Those without disease progression underwent immediate surgery. This study enrolled, over 4 years, 41 pts (61% men, mean age 59 years (range 33–75), with toxicity and survival data available for 40. Median tumor size was 3.1 cm, 9 pts presented positive nodes at CT scan and/or ultrasonography. All pts completed radiation, 37/41 (90%) received at least 46 Gy, 30/41 (73%) received at least 75% of the chemotherapy dose. Twenty six patients (63%) underwent a curative surgical resection, 6 had a palliative anastomosis, 4 a laparotomy, 5 (12%) did not undergo surgery due to distant disease progression at restaging. Thirty day post-operative mortality was 0.24%. Four patients presented a grade 4 (G4) hematological toxicity, 1 had a G4 postoperative sepsis, 1 died of late sepsis at 2 months post-surgery. Pathological findings show, in 11/26 pts (46%) more than 80% strongly alterated malignant cells, associated with necrotic areas in 72% of cases. One pathological complete response has been described. The feasibility of this preoperative concurrent chemoradiation regimen was established (67.5%); disease progression during the the 9–11 week preoperative period was rare (12%); 63% of all pts underwent a potentially curative resection. Toxicity was manageable and did not prevent successful surgery. This scheme compares favorably to other studies, and can now be tested on a phase III setting. Definitive data will be presented during the meeting.

727 POSTER

Clinical results of inoperable hepatocellular carcinoma treated with three-dimensional conformal radiotherapy: factors affecting the tumor response and survival rate

S. Maeda, S. Hayashi, M. Matsuo, M. Kanematsu, O. Tanaka, S. Goshima, H. Kondou, H. Hoshi. *Gifu Univercity School of Medicine, Radiology, Gifu, Japan*

Purpose: To evaluate the clinical results of factors affecting tumor response and survival rate of patient with hepatocellular carcinoma (HCC) treated with three-dimensional conformal radiotherapy (3D-CRT).
Materials and methods: From 1998 to 2004, 49 patients (pts) with HCC were treated with 3D-CRT. They were not indicated for surgery. Their characteristics were follows: mean age 68.5 years old (41–85 y.o.); performance status (PS): 35 pts in 1, 12 pts in 2, and 2 pts in 3; Child-Pugh classification: 23 pts in class A, 19 in B, and 7 in C; UICC (2002) stage: 23 pts in II, 27 in III, and 19 in IV. 15 pts had ascites before 3D-CRT. 32 pts were treated for main hepatic tumor, 15 for PV tumor thrombi, and 2 for IVC thrombi. The mean tumor size was 4.3 cm (range 1.3–12 cm). The mean radiation dose was 44 Gy (15–60 Gy) in a daily fraction of 2–3 Gy using 10-MV linear accelerator. The mean biologic effective dose at $\alpha/\beta = 10$ was 44.7 Gy. Tumor response was evaluated by the change in maximum diameter detected on CT and MRI images 1–3 months after radiotherapy. The variability of age, PS, Child-Pugh classification, UICC stage, ascites, PV/IVC tumor thrombi, tumor size and radiation dose was evaluated between complete response (CR) + partial response (PR) group and no change (NC) + progressive disease (PD) group. The factors associated with survival were also evaluated by using Cox regression model. Lesion-to-liver contrast-to-noise ratio (CNR), signal-to-noise ratio (SNR), and standard deviation (SD) were evaluated on T2 weighted MR imaging before and after radiotherapy in 38 patients.
Results: The mean follow-up was 9 months (2–40 months). 16 patients (33%) got PR, 22 (45%) NC, 11 (22%) PD, and no patient got CR. The tumor response rate (CR+PR) was 33%. Radiation dose was the only significant factor for tumor response on Mann-Whitney U-test ($p < 0.05$). The over all survival rate at 1 and 2 year was 49.6% and 24.3%, respectively (median survival 14.5 months). On univariate analysis, PS, Child-Pugh classification, PV tumor thrombi and ascites were significant factors for survival rate ($p < 0.05$). On multivariate analysis, PS was only significant factor. In PR group, CNR after radiotherapy was significantly higher than before ($p < 0.01$).
Conclusions: Radiation dose was significant factor in tumor response, while tumor size and PV/IVC tumor thrombi were not significant. CNR was useful to evaluated tumor response of the patient with HCC treated with 3D-CRT. Additional efforts for dose escalation may be warranted to improve the treatment results.

728 POSTER

Histological results of endoscopic resection for esophageal lesions diagnosed as high-grade intraepithelial squamous neoplasia by endoscopic biopsy

Y. Shimizu[1], M. Kato[1], J. Yamamoto[2], Y. Ono[2], T. Ito[3], M. Asaka[2]. *[1]Hokkaido University Hospital, Division of Endoscopy, SAPPORO, Japan; [2]Hokkaido University Hospital, Third Department of Internal Medicine, SAPPORO, Japan; [3]Hokkaido University Hospital, Division of Pathology, SAPPORO, Japan*

Background: The ability to detect early squamous neoplasia of the esophagus can be enhanced considerably by iodine staining during endoscopic examination. Histologically, biopsy specimens obtained from the lesion detected in endoscopic screening were often diagnosed as high-grade intraepithelial squamous neoplasia (WHO 2000). However, there are very few reports on the characteristics of such intraepithelial squamous lesions, and a management strategy for such lesions has therefore not been established. In this study, we prospectively performed endoscopic mucosal resection (EMR) for esophageal lesions diagnosed as high-grade intraepithelial squamous neoplasia by endoscopic biopsy and investigated histological features of the lesions in totally resected specimens.
Patients and methods: During the period from April 2001 to September 2004, 51patients were found to have lesions diagnosed as high-grade intraepithelial squamous neoplasia of the esophagus by endoscopic biopsy at Hokkaido University Hospital and associated hospitals. All patients underwent EUS with the use of a high-frequency catheter probe and were confirmed to have no evidence of submucosal tumor invasion. Subsequently, all patients underwent EMR at Hokkaido University Hospital.
Results: Histological examination of totally resected specimens revealed that 12 (23.5%) of the 51 patients had tumor invasion of the basement membrane that was confined to the lamina propria mucosae and that 4 (7.8%) of the 51 patients had tumor invasion of the muscularis mucosae. The remaining 35 patients (68.6%) were confirmed to have high-grade intraepithelial squamous neoplasia of the esophagus. The invasive focus all of the 16 lesions of invasive squamous cell carcinoma was surrounded by high-grade intraepithelial squamous neoplasia.
Conclusions: Histological results suggested that high-grade intraepithelial squamous neoplasia of the esophagus has characteristics of carcinoma in the pre-invasive stage. EMR, which can be employed both therapeutically and diagnostically, should be performed for esophageal lesions diagnosed by endoscopic biopsy as high-grade intraepithelial squamous neoplasia not only because of its probable malignant potential but also because over 30% of such lesions are actually invasive carcinoma.

729 POSTER

Postoperative adjuvant gemcitabine alone and concurrent with radiation after resection of locally advanced pancreatic carcinoma

S. Ozkok[1], S. Dubova[1], Y. Yuzer[2], D. Yalman[1], R. Uslu[3], A. Coker[2], M. Zeytunlu[2], E. Goker[3]. *[1]Ege University, Radiation Oncology, Izmir, Turkey; [2]Ege University, General Surgery, Izmir, Turkey; [3]Ege University, Medical Oncology, Izmir, Turkey*

Purpose: Gemcitabine is a pyrimidine analogue which has potential activity in advanced pancreatic cancer and is a powerful radiosensitizer. We evaluated the efficacy and toxicity of postoperative administration of Gemcitabine (GEM) alone, followed by concurrent GEM and irradiation (RT) after resection for locally advanced pancreatic adenocarcinoma.
Methods and materials: Between 1999–2004, thirty-three patients (median age 58 years, range 21–78, median Karnofsky Performance Status 90, range 70–100) with stage II (7 patients) and stage III (26 patients) resected pancreatic adenocarcinoma were treated. Twenty-nine patients (88%) had RO and four patients (12%) had R1 resection. GEM 1000 mg/m^2 on D1, 8, 15 was given within a median of 32 (range 21–103 days) days after surgery, followed by GEM 300 mg/m^2 weekly concurrent with radiotherapy (50.4 Gy in 180 cGy daily fractions(. After the completion of chemoradiotherapy, patients received three additional courses of GEM 1000 mg/m^2 on D1, 8, 15 in one cycle. Each cycle consisted of 3 weeks of treatment followed by a 2 week chemotherapy free interval.
Results: Twenty-four (73%) patients received 4 to 6 courses of weekly GEM, eight patients received 2 to 3 courses and one patient could not receive any. Grade III-IV hematologic toxicity, mainly leuocopenia occurred only in 3 (9%) patients. Grade I and II gastrointestinal toxicity (nausea, vomiting) occurred in 9 patients (27%), whereas grade III or IV gastrointestinal toxicity was not observed. Concurrent gemcitabine and radiotherapy was completed without treatment interruptions in 33% of the patients. Median treatment interruption was 3 days (range 1–26 days). Twenty-seven patients (81.8%) received GEM after chemoirradiation. During a median follow-up of 35 months (range, 12–68) local recurrence was observed in 4 (three of them had peritoneal seeding or distant

metastasis concurrently), peritoneal seeding in 4 and distant metastasis (mostly liver) in 12 patients. The median survival duration is 17 months.
Conclusion: This adjuvant regimen was well tolerated and can be easily administered after surgery for locally advanced pancreatic cancer.

730 POSTER

Therapeutic strategy for superficial cancer of the esophagus

T. Tanaka, H. Fujita, S. Sueyoshi, K. Shirouzu. *Kurume University, Department of Surgery, Kurume-Shi, Japan*

Purpose: To clarify the optimal treatment strategy for superficial esophageal cancer, mucosal and submucosal cancer, based on the results of surgical treatment.
Patients and methods: Between 1984 and 2003, 136 patients (121 males and 15 females, mean age 62 years) with a superficial esophageal cancer underwent radical esophagectomy. We reviewed the clinicopathologic results and postoperative survival of these patients.
Results: The depth of tumors resected were mucosal layer in 33 patients and submucosal layer in 103 patients. Patients with Tis (n = 5) or lpm cancer (n = 8) had no positive node, however, 2 out of 20 patients with mm cancer had lymph node involvement (N1). Forty (38.9%) out of 103 submucosal cancer (T1b) patients had nodal involvement (N1), and 8 had nodal metastases away from regional lymph node (M1-lym). 5- and 10-year overall survival rate for patients with mucosal cancer were 87% and 52%, and 60% and 50% with submucosal cancer. Operative mortality and hospial mortality rate were 1.4% and 2.2%. Only one out of 33 mucosal cancer patients died of recurrent disease (3%), and 19 died of recurrent disease in submucosal cancer patients (18%). Other maligancies were associated in 52 patients (38%). Half of patients died of other malignancies after 5-year survival. 5- and 10-year cause-specicific survival rate with mucosal cancer were 93% and 89%, and 80%, 78% with submucosal cancer. While there was no difference in survival between N0 and N1, there was a significant difference in survival of patients with or without other malignancies ($p < 0.05$).
Conclusions: Most of mucosal cancer could be cured by the local surgical treatment, such as endoscopic mucosal resection (EMR) and laser therapy. Radical esophagectomy should be considered for patients with mm cancer who predicted with nodal involvement. Radical esophagectomy with lymph node dissection is necessary for patients with submucosal cancer. Control of other malignancies is important to improve the survival of patients with superficial esophageal cancer.

731 POSTER

High-dose-rate brachytherapy for cancer of the biliary tract

J. Yokouchi[1], K. Satani[1], N. Kanesaka[1], H. Waki[1], K. Abe[1], S. Takekawa[2]. [1]*Tokyo Medical University, Radiation Oncology, Tokyo, Japan;* [2]*Southern Tohoku Hospital, Radiology, Koriyama, Japan*

Background: Although cancer of the bile duct is rare, the prognosis for this tumor type is poor. Surgery is the only curative treatment, however most patients present with a contraindication for radical surgery. Our aim is to evaluate combined treatment with high-dose-rate brachytherapy (HDT-BT) and conventional fractionated external beam radiotherapy (ERT) for unresectable, locally advanced biliary tract cancer. We also assessed the feasibility of treatment with HDR-BT alone for aged patients.
Material and methods: Between 1986 and 2004, 54 consecutive patients with unresectable, locally advanced biliary tract cancer were treated with HDR-BT (29 men, 25 women; median age 72 years, range 50 to 88). The median HDR-BT dose was 30 Gy prescribed to a point 1 cm from the midline. Thirteen patients received HDR-BT alone (median age 84 years) and 41 received HDR-BT and ERT (median dose 40Gy). ^{60}Co was the source for HDR-BT until 1998 and then ^{192}Ir was used.
Results: The overall survival rate at 1, 2 and 5 years was 41.5%, 27.9% and 11.6% respectively. Survival was no significantly different between the patients treated with ERT and HDR-BT and those treated with HDR-BT alone. Acute gastrointestinal symptoms during radiotherapy were acceptable with 2 cases of biliary fistula and 2 of liver abscess as late complications.
Conclusions: Combined radiotherapy which ERT (40 Gy) and HDR-BT (30 Gy) is feasible and complications are within acceptable limits. HDR-BT alone provided reasonable local control and improved quality of life for aged patients since they could be treated as outpatients.

732 POSTER

Role of radiotherapy in treatment of portal vein thrombosis from hepatocellular carcinoma

J.H. Kim, C.E.K. Kim, S.D. Ahn, S.W. Lee, S.S. Shin, Y.S. Lim, Y.W. Chung, Y.S. Lee. *University of Ulsan College of medicine, Radiation oncology, Seoul, Korea*

Background: To analysis the role of radiotherapy in treatment of portal vein thrombosis (PVT) from hepatocellular carcinoma (HCC).
Methods: PVT from HCC were treated with 3 dimensional conformal radiotherapy (3D-CRT) and evaluated with CT scan after radiotherapy. The radiation dose ranged from 40 Gy/16 fractions to 60 Gy/30 fractions, which was determined according to the volume of normal liver in 20 Gy isodose distribution and bowel in 50 Gy equivalent dose. Response was determined by measuring the extent of PVT on CT scan at 0, 1 and 3 months after completion of radiotherapy. Median follow-up period for response evaluation was 4 months.
Results: Forty six patients were enrolled and 39 of them who received at least 70% of the planned dose and checked follow-up CT scan were eligible for this analysis. Size of GTV ranged from 3.9 to 17.7 cm, and the median was 9.6 cm. Complete or marked improvement of PVT was observed in 18 patients (45%), and 17 patients (43%) showed no further progression. There was no dose-response relationship among dose groups of 45 Gy/15 fractions, 48 Gy/12 fractions, 50 Gy/20 fractions, and 60 Gy in 30 fractions for the reduction of PVT. However, higher dose group (50 Gy or higher) showed a trend of lower rate of PVT progression (20% vs. 7%) and smaller tumors (longest diameter of GTV less than 8 cm) showed a tendency of higher response rate than large tumors (64% vs. 41%, $p = 0.12$). Transarterial chemoembolization (TACE) was possible after radiotherapy in 19 patients (57%).
Conclusion: Radiotherapy with dose of 45 Gy in 3 Gy fractions (or a TDF value $\geqslant$90) was effective for palliation of PVT in patients with moderate size of HCC. But higher dose to focal PVT should be investigated for higher response rate.

733 POSTER

The impact of conformal therapy in the treatment of anal cancer

N. Kopek, T. Vuong, L. Portelance, B. Bahoric, K. Sultanem, S. Devic. *McGill University, Radiation Oncology, Montreal, Canada*

Introduction: Conformal therapy has been introduced in an attempt to alleviate the acute toxicities related to radiation and concurrent chemotherapy. This study reports the long-term outcomes on local control and survival results from this treatment and compares with those from conventional techniques.
Materials and Methods: From 1997–2003, 57 consecutive patients were treated with conformal therapy (6-field arrangement) to deliver 54 Gy in 30 fractions without interruption and concurrently 2 cycles of chemotherapy during weeks 1 and 6 of radiation using 5-Fluorouracil (5-Fu, 1000 mg/m^2/day, 96 hour continuous infusion) and Mitomycin C (MMC, 10 mg/m^2, bolus on day 1) while from 1990–2002, 60 patients were treated conventionally using antero-posterior fields followed by a 3 field arrangement, to deliver 52–59.4 Gy in 25–33 fractions in split course therapy with 2 cycles of concurrent chemotherapy using CI of 5-Fu and either MMC or Cisplatinum (75 mg/m^2) as a bolus on day 1.

Table 1: Tumour characteristics and acute toxicity data for the two techniques

Tumour characteristics and patient acute toxicity data	Conformal Therapy	Conventional Therapy
T2	50%	60%
T3	32%	28%
T4	18%	12%
N0	60%	70%
N+	40%	30%
Acute toxicity rate $\geqslant$G3		
GI	5%	11%
bone marrow	12%	16%
skin	18.5%	43.3%

Results: Patients treated with conformal therapy and conventional therapy respectively had actual 5-year local recurrence free rates of 90.7% and 66.1% ($p < 0.02$), 5-year disease free survival rates of 74% and 48%($p = 0.0095$) and overall survival rates of 74% and 55% ($p < 0.005$). In the multivariate analysis, the nodal status is the most significant factor