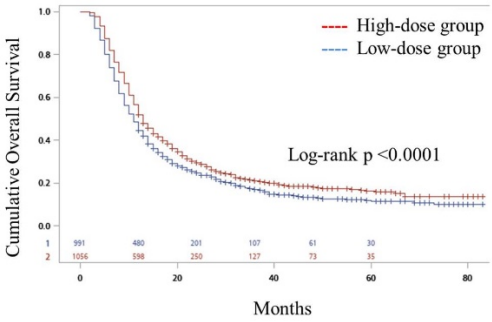

Conclusion
In Taiwan, more than half of the stage III EsoC patients who were treated with dCCRT received a radiation dose greater than 5940cGy. The results of this study indicate that those received a higher radiation dose greater than 5940cGy had a better OS than those received a radiation dose lower than 5940cGy.

PH-0157 Proton therapy achieves favorable dosimetric sparing and acute toxicity for esophageal cancer

Abstract withdrawn

PH-0158 The role of adjuvant radiation therapy in non-hilar extrahepatic bile duct cancer
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Purpose or Objective
The benefit and indicationof adjuvant RT has is unclear. The goal of this study is to identify the role of adjuvant radiation therapy (RT) in non-hilar extrahepatic bile duct cancer (NH-EHBDC) patients treated with radical surgery by identifying subgroups that benefit from adjuvant RT and to suggest a potential indication for adjuvant RT.
Material and Methods
We retrospectively reviewed NH-EHBDC patients who underwent radical surgery with or without adjuvant treatment from October 2004 to June 2018 at our institution. Patients treated with any neoadjuvant treatment, incomplete RT, histology other than adenocarcinoma, or history of cancer without 5 years of no evidence of disease period before the diagnosis of NH-EHBDC were excluded. Finally, 332 patients were included in our study. For pT3 stage, positive node, and R1 resected patients, adjuvant concurrent chemoradiation was recommended. Univariate and multivariate analyses were conducted to identify prognostic factors for locoregional recurrence-free survival (LRRFS), distant metastasis-free survival (DMFS), disease-free survival (DFS), and overall survival (OS). High-risk patients for locoregional recurrence were analyzed to identify the role of adjuvant RT.
Results
Overall, 131 (39.5%), 25 (7.5%), 7 (2.1%), 167 (50.3%), and 2 (0.6%) patients received no adjuvant treatment, adjuvant chemotherapy, adjuvant RT, adjuvant concurrent chemoradiation ± maintenance chemotherapy, and sequential chemoradiation, respectively. Median RT dose was 50.4Gy (range, 40-59.4Gy). At a median follow-up of 32.2 months (range, 1.6-178.0 months), 3-year LRRFS, DMFS, DFS, and OS were 73.8%, 57.4%, 49.1%, and 64.6%, respectively. In multivariate analysis, adjuvant RT ≥ 50Gy (vs. no RT, HR 0.48, P=0.002), preoperative CA19-9 > 37U/mL (HR 1.79, P=0.013), bile duct resection or hilar resection (vs. pancreaticoduodenectomy or pylorus-preserving pancreaticoduodenectomy, HR 2.25, P=0.021) nodal involvement (HR 1.65, P=0.036), and venous invasion (HR 1.77, P=0.024) were identified as independent prognostic factors for LRRFS. For pT3 stage (81.6% vs 63.7%, P=0.030), node positive (78.9% vs 52.5%, P=0.002), and R1 resected patients (87.5% vs 0.0%, P=0.017), adjuvant RT ≥ 50Gy significantly improved 3-year LRRFS. However, in patients with preoperative CA19-9 > 37U/mL (77.9% vs 59.6%, P=0.100), bile duct resection or hilar resection (68.7% vs 43.9%, P=0.100), venous invasion (67.9% vs 41.2%, P=0.082), the benefit of adjuvant RT was not statistically significant. In node positive patients and R1 resected patients, adjuvant RT ≥ 50Gy significantly improved DFS and OS, respectively. Impact of chemotherapy was not observed over various treatment end-points.
Conclusion
In patients with NH-EHBDC, the use of adjuvant RT ≥ 50 Gy significantly improved LRRFS. For patients who are at high risk of locoregional recurrence, especially for patients with nodal involvement or R1 resected patients, adjuvant RT should be considered in order to achieve improved survival.

PH-0159 NANORAY-103: Phase I/II trial of NBTXR3 activated by SBRT in patients with HCC and liver metastases
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Purpose or Objective
The use of stereotactic body radiotherapy (SBRT) for the local control of unresectable hepatocellular carcinoma (HCC) or liver metastases (mets) is well tolerated but limited by the need to preserve liver function. Increasing energy deposit within the tumor without increasing toxicity in healthy tissues remains a major challenge in radiation oncology. NBTXR3 (hafnium oxide nanoparticles), a first-in-class radioenhancer when activated by RT augments energy dose deposit within tumor cells, increasing tumor cell death compared to RT alone, while sparing healthy tissues.
Patients (pts) with HCC or mets may benefit from the mode of action of NBTXR3. A phase I/II clinical trial has been conducted to evaluate NBTXR3 activated by SBRT in these pts [NCT02721056].
Material and Methods
The Phase I is a 3+3 dose escalation scheme with 5 NBTXR3 dose levels: 10, 15, 22, 33, and 42% of baseline tumor

volume. NBTXR3 has been administered by intratumoral injection (ITI) followed by SBRT (45 Gy / 3 fractions / 5 to 7 days or 50 Gy / 5 fractions / 15 days). Primary endpoints were determination of the RP2D and early DLTs. Secondary endpoints included the safety profile, liver disease scores evolution, and early efficacy by response rate (mRECIST/RECIST 1.1).

Results

Twenty pts have been treated. The dose levels of 10, 15, 22 and 33% are completed: 6 pts at 10% (2 SBRT doses tested due to organ constraints), 4 pts each at 15% and 22% (due to fiducial displacement and ITI shift) and 3 pts at 33%. The final (42%) dose escalation level is ongoing with 3 pts treated thus far. No early DLT has been observed. One SAE (G3 bile duct stenosis) related to NBTXR3 and RT occurred at the 22% dose level. Adverse events related to ITI or NBTXR3 were: G2 malaise at the 10% dose level, 2 G3 abdominal pain at 15%, G1 pleural effusion and G3 bile duct stenosis at 22% and G1 fatigue at 33%. No clinically meaningful changes in CPS and APRI were observed post-treatment and CT-scan showed no leakage of NBTXR3 into surrounding healthy tissues. Best observed response in evaluable patients for HCC (n=8) were 5 CR, 3 PR and for mets (n=5) the results were: 4 PR, 1 SD.

Conclusion

Intratumoral injection of NBTXR3 is feasible, demonstrated a very good safety and tolerability profile up to the 42% dose level. Recruitment at the 42% dose level is nearly finalized. Early efficacy results suggest NBTXR3 has the potential to address an unmet medical need in pts with unresectable primary or metastatic liver cancer.

PH-0160 Update of mono-institutional retrospective cohort of 200 patients affected by HCC treated with SBRT

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Purpose or Objective

Standard treatment of hepatocellular carcinoma (HCC) is surgery and liver transplantation. RadioFrequency Ablation (RFA), TransArterial ChemoEmbolization (TACE) are used as alternative. Stereotactic Body Radation Therapy (SBRT) is a new oncological and technological approach. Aim of the study is to evaluate the clinical results of stereotactic body radiation therapy in the treatment of hepatocellular carcinoma (HCC) in patients unsuitable or failing to standard loco-regional therapies.

Material and Methods

We retrospectively reviewed a cohort of two-hundred patients with 291 HCC lesions treated with a SBRT at a single Institution between September 2012 and April 2019. SBRT treatment reckon on a prescription dose between 36-48 Gy in 3-5 fractions at the isodose of 80%. Primary endpoint included in-field (LC) local control and toxicity. Secondary endpoints were overall (OS), cancer-specific (CSS) and progression-free survival (PFS). Acute toxicity was scored with CTCAE 4.3 and tumor response with mRECIST parameter. Characteristics of the patients are shown in Table

1.

	Number (%)	Average (range)
Gender		
Male	152 (76)	
Female	48 (24)	
Age		68 (42-89)
Stage		
BCLC 0	31 (15,5)	
BCLC A	117 (58,5)	
BCLC B	46 (23)	
BCLC C	6 (3)	
Child-Pugh Score		
A	169 (84,5)	
B7	22 (11)	
B 8-9	6 (3)	
Not evaluable	3 (1,5)	
Cirrhosis		
Viral	130 (65)	
Not viral	70 (35)	
Indications		
Exclusive	89 (44,5)	
Relapse	111 (55,5)	
OLT	28 (14)	
Tumor size		25 (10 – 120)
Tumor site		
Caudate lobe	18 (6,2)	
Right liver	188 (62,5)	
Left liver	85 (31,2)	
Median time Diagnosis – SBRT		29 months
Median follow-up		20 months

Results

Median follow-up was 20 months (range 1-77). 169 (84,5%) patients had a Child-Pugh class A, 28 (14%) a class B, in 3 (1,5%) patients Child-Pugh class was non evaluable. Median lesion size was 25 mm (range 10-120).188 (62,5%) lesions were located in the right liver, 85 (31,2%) in the left liver and 18 (6,2%) in the first segment. 89 (44,5%) lesion were treated with SBRT only while 111 (55,5%) were relapses. During follow-up 167 lesions (57,3%) had a complete response, 57 (19,5%) had a partial response, 35 (12%) were stable and 15 (5,1%) radiological progression. Twenty-eight patients (14%) went to liver transplantation. LC at 12, 24 and 36 months was 99,5%, 98,3% and 98,3% respectively. OS at 12, 24 and 36 months was 79,9%, 63,6% and 53,5% respectively. Till the end of follow-up ninety-two patients (46%) died. CSS at 12, 24 and 36 months was 86,8%,74,1% and 67,6% respectively. PFS at 12, 24 and 36 months was 58,1%, 48,3% and 42,7% respectively. Fifteen patients (7,5%) experienced extra-hepatic failure.15 patients (9%) experienced G3-G4 acute toxicity at the blood chemistry test and 1 patients died for liver failure. Taking into account a Delta-Child score > 2 twelve cases of non-classic Radiation-Induced Liver Disease (RILD) were reported.

Conclusion

SBRT is a safe , effective and well tolerated treatment for patients with naïve or recurrent HCC but needs an appropriate selection of the lesions to be treated, an adequate technological equipment and an experienced staff.