concerning time to progression and overall survival in patients with the same tumor entity, who received fotemustin mixed with iodinated poppy seed oil via transarterial chemoembolization (TACE).

Materials and Methods: Hitherto we included 20 patients (7 females and 13 males) aged 38–74 years (mean 59 years) who received SIRT for hepatic metastases from uveal melanoma. Imaging with CT or MRI was performed before SIRT and approximately 3 months after intervention to assess tumor response. Further imaging was performed in an interval of approximately 3 months. All patients underwent Tc-99m macroaggregated albumin (Tc-99m MAA) scintigraphy 1 week prior to SIRT for evaluation of potential extrahepatic uptake. Response to treatment and progression-free survival, as well as overall survival were calculated. The results were then compared with a cohort of patients suffering from the same disease in comparable conditions who were treated with Fotemustin via TACE.

Results: A mean treatment dose of 1.5 ± 0.5 GBq Y90-SIR-Spheres was applied. After 1 SIRT (only 2 patients, who initial showed partial response with progression were treated a second time), 7 patients showed partial response (PR) with a median time to progression of 7 ± 2.9 months (range: 3–25 months) and 6 patients showed stable disease with a median time to progression of 8 ± 1.9 months (range 3–14 months). 5 patients showed progressive disease (PD). 10 patients died of progressive disease within the observation period with a mean overall survival time of 8.5 ± 3.9 months (range: 1–32 months). Concerning TACE with Fotemustin, the included 21 patients required up to 6 interventions and showed a mean progression free survival of 7.3 months (3.3–11.3 months). Comparing to 1 intervention with SIRT, the results are quite similar, but concerning safety and adverse events, with SIRT, patients showed only minor symptoms like pain and nausea during the intervention while with TACE, patients had heavier and longer lasting symptoms like fever, pain and nausea, which required medication. Additionally, multiple interventions were required.

Conclusion: With these preliminary results we want to show the efficacy and safety of SIRT in isolated hepatic metastases derived from uveal melanoma and to compare the results with the previous in house standard approach with Fotemustin via TACE. Our preliminary results were promising by indicating a superiority of SIRT concerning adverse events and quality of life with equal efficacy compared to TACE.

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S7-04

Yttrium-90 Intra-Arterial Radioembolization Therapy of Unresectable Intrahepatic Cholangiocarcinoma: 5-Year Experience at a Single Center

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Aim: The aim of this study is to assess the safety and efficacy of intra-arterial radioembolization (IARE) of unresectable intrahepatic cholangiocarcinoma (ICC) with yttrium-90 (^{90}Y) to promote its wider clinical application.

Materials and Methods: This retrospective study included 17 patients (age range 47–82 years, median age 66 years; 11 male, 6 female) diagnosed with ICC treated with ^{90}Y IARE at a single institution during a 5-year period, from 2009 to 2014. Patient selection criteria included: histologically proven diagnosis of ICC, unresectable tumor, an EGOS (WHO) performance score of 0, 1 or 2, adequate baseline hematology and life expectancy of at least 3 months. The general tumor profile was observed and documented. Pre- and post-therapy the following criteria were assessed: (1) Biochemical and clinical toxicity according to CTCAE v3.0, (2) CT imaging at baseline and response according to mRECIST at 1, 3 and 12 months, and (3) median survival after the first treatment using Kaplan–Meier method. The baseline bilirubin level was <1.3 mg/dL in 14 of 17 patients. The medium radioactivity given was 1.45 ± 0.43 GBq.

Results: The tumor profile demonstrated: Peripheral tumors = 1/17 (5.9%), infiltrative tumors = 16/17 (94.1%); solitary tumor = 1/17 (5.9%), multifocal disease = 16/17 (94.1%); tumor volume <25% of liver volume = 16/17 (94.1%); liver-only disease = 16/17 (94.1%) patients. At the time of treatment, 6/17 patients had imaging findings indicative of portal venous thrombosis (PVT), and 10/17 patients presented with cirrhosis According to mRECIST criteria on imaging with CT, follow-up at 1 month demonstrated PR in 2/17 (11.8%), CR in 0/17 (0%), PD in 2/17 (11.8%), and SD in 13/17 (76.4%) patients. At 3 months of follow-up we observed PR in 1/15 (6.7%), SD in 9/15 (60%), CR in

2/15 (13.3%), PD in 2/15 (13.3%) patients, 2 patients died, and no information was available for 1/15 patient. At 12-month follow-up and we observed PR in 1/12 (8.3%), SD in 2/12 (16.7%), PD in 7/12 (58.3%) and CR in 0/12 (0%) patients, 5 patients were deceased, and no information was available for 2/12 patients. The median follow-up was 15.1 (range, 2–40) months, and the median survival after ^{90}Y IARE was 15.9 months, except for 1 patient with only a 3-month follow-up which was excluded from this analysis . Post-treatment minor adverse effects were reported in 4 (23.5%) patients, which was associated with post-embolization syndrome (fatigue, transient abdominal pain, fever, and nausea/vomiting). We did not observe any hematological toxicity following IARE.
Conclusions: ^{90}Y Intra-arterial radioembolization (IARE) promises to be a relatively safe and efficacious treatment for unresectable ICC. As demonstrated in this study IARE for ICC appears to confer a survival benefit of almost 16 months compared to systemic therapies. It demonstrates a favorable response by imaging criteria and has an acceptable post-procedural safety profile. Larger series and longer follow-up are needed to provide more reliable results and to further assess its impact on clinical management of unresectable ICC.

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S7-05

In Situ Vaccination: The Synergistic Roles of Immunotherapy and Radiobioconjugate Targetted Therapy

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Objectives: To examine the evidence for the *in situ* vaccination phenomenon in Cancer Radiobioconjugate therapy, and suggest ways to maximise this.
Methods: Computation of the radiation doses delivered during radiobioconjugate targeting with special reference to hepatic metastases treated with 131 I labelled M3 antibody directed against the TPS tissue polypeptide specific antigen. Comparison with radiation doses delivered by external radiotherapy. Literature search regarding other evidence of synergy between immunotherapy and radiobioconjugate therapy. Measurement by immunoradiometric asssay of effects of external radiotherapy on circulating TPS levels during local irradiation of experimental animal tumours.
Results: Patients with hepatic metastases from colon carcinoma showed palliative effects with intravenous administration of 131 Iodine labelled anti TPS M3 antibody at doses of 25 Rads. Serial TPS estimations by immunoradiometric assay IRMA in experimental mice with xenografts of breast carcinoma created with MCF 7 cell lines injected subcutaneously showed rise in circulating TPS levels after external irradiation. Literature search supported the concept of *in situ* tumour vaccination inducing an anti tumour effect synergistic with the effect of radiobioconjugates. Such effects were possibly favoured by the repetitive continuous low dose rate radiation in radioimmunotherapy as contrasted to the mega doses in external radiotherapy.
Conclusions: *In situ* vaccination is a possible mechanism for the beneficial effects of radiobioconjugate Therapy although delivering radiation doses much less than the 60 rads used in external radiotherapy. The immune effects may be enhanced by external irradiation or cytokines or thermal warming of the tumour sites, or by the use of adjuvants locally, Toll like receptor agonists such as in recent trials combining local radiotherapy with intratumoral administration of toll like receptor (TLR) agonists or agents which recruit dendritic cells to the tumour.

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S7-06

Personalized Dosimetry with Intensification Using 90Y-Loaded Glass Microsphere Radioembolization Induces Prolonged Overall Survival in Hepatocellular Carcinoma Patients with Portal Vein Thrombosis

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Aim: To evaluate the response rate and survival of hepatocellular carcinoma (HCC) portal vein thrombosis (PVT) patients treated with ^{90}Y-loaded glass microspheres (Therasphere®) using a personalized dosimetry and intensification concept.
Material and Methods: Therasphere® was administered to 41 HCC PVT patients (main = 12; lobar/segmental = 29). ^{99m}Tc-Macroaggregated albumin (MAA) single-photon