Results: Palliation of jaundice and pruritus was achieved in all. The median overall survival in ILBT and EBRT group was 8 and 9 months with the stent patency 7 and 8 months and overall survival at 1 year was 21% and 23%. Gastric outlet obstruction was detected in 29% in ILBT group and 19% in EBRT group(p=ns), while distant failure rate were 60 % & 55%. No ILBT related morbidity was observed.

Conclusion: PTBD is safe, well tolerated and effective in palliation of Jaundice. Intraluminal Brachytherapy (ILBT) appears to prolong stent patency. The addition of EBRT to ILBT does not show any advantage in terms of stent patency and overall survival.

OC-0151
Radiation induced toxicity and tumour control in pts treated for uveal melanoma with Ir-106 plaques
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Purpose or Objective: In a retrospective study of 100 consecutive patients treated with Ru-106 eye plaques for uveal melanoma from 2005 to 2008 at our clinic, we aimed to investigate the correlation between the dose to the optic nerve and optic nerve damage; the dose to the macula and macular damage; and the minimum dose to the tumour and tumour control.

Material and Methods: Pre-treatment fundus images were imported into Plaque Simulator TM and the tumour was retrospectively contoured by an ophthalmologist. The plaque position was found using the radiocentric dose. The dose was calculated using the radiocentric dose. The dose was calculated using the radiocentric dose. The dose was calculated using the radiocentric dose. The dose was calculated using the radiocentric dose.

Results: 16 % of the patients developed optic nerve damage. Only optic nerve dose was correlated with damage to the optic nerve (p=0.000063) in univariate analysis. 51% of the patients had macular damage. Only macular dose was correlated with damage (p=0.00049) in univariate analysis. 32 % of the patients did not achieve tumour control. TCP was correlated with minimum tumour dose and gender in univariate analysis. Patients with minimum doses > 80 Gy had 100% TCP. For 80% of the patients with tumour recurrence, the plaque did not geometrically overlap the tumour. Dose response curves were drawn for optic nerve damage, macular damage and TCP. Such curves could not be found in the literature so no comparison was possible. Previously published values for TCP are similar to, or higher than, the one found in the present material. However, the papers citing higher values have selected patients with smaller tumours, which tend to have higher values of TCP. We emphasise that the number of patients is quite small and that a study of a large patient cohort is planned.

Conclusion: Tumour control only failed in patients who received less than the prescription dose. The use of image guided planning software (such as Plaque Simulator TM) may aid in optimizing tumour control in the future. The present analysis presents the first reported dose response curves for damage to the optic nerve and macula. This information may be useful in delivering the optimal treatments in future.

OC-0152
Novel software modules for treatment planning of 106Ru eye plaque brachytherapy
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Purpose or Objective: Treatment of uveal melanoma by means of brachytherapy using 106Ru eye plaques achieves very good tumor control while keeping morbidity at an acceptable level. However, a deeper understanding of the underlying dose-response relationship is still missing not least because of the lack of appropriate software packages for 3D treatment planning and volumetric dose assessment. This motivated the in-house development of software modules to calculate the dose distributions in critical, ophthalmologic structures as well as tumor for an eye model.

Material and Methods: A resizable 3D model of an eye was created in Sidefx Houdini, consisting of lens, ciliary body and optic nerve as well as macula, retina and sclera. A dome-shaped tumor model can be added with apex height and basal diameter as adjustable parameters. The position of the tumor model can be fixed by reference to the distance between tumor and macula and tumor and optical nerve. Alternatively fundus images can be incorporated into the 3D model in order to account for the individual tumor shape. A specially designed algorithm projects the images onto the virtual eye model and converts them to volumetric data. Different types of BEBIG eye plaques (CCA, CCB and COB) can be positioned within the computer model. Corresponding dosimetric lookup tables were generated from MC simulations using MCNP6. Superposition onto the 3D eye model enables the calculation of doses and volume parameters for the tumor and adjacent healthy tissue. Finally, dosimetric safety margins have been obtained by performing film measurements and can be included in order to determine dosimetric uncertainties.

Results: The software modules can calculate full 3D dose distributions with a cubic dose grid of 200 μm in < 5 s (and < 1 s with GPU). The 3D eye model can be adjusted on the basis of simple geometric measures such as the measured size of the eye as well the distances between tumor, macula and optic nerve and thereby be used for individual treatment planning, i.e. the selection and positioning of the type of plaque. The registered fundus projection can be used to guide the tumor delineation. Dose-volume metrics can be generated for all structures of the individualized model which in turn can be used for assessing dose-response relationships for the target volume and organs-at-risk. The dosimetric uncertainty assessment provides information on safety margins. Local agreement between MC and film was better than 6 % for the first 7 mm.

Conclusion: In this study we presented novel software modules for treatment planning in 106Ru eye plaque brachytherapy of uveal melanomas. It is aimed to be used in daily treatment planning as well as for performing pre- and retrospective studies to provide further information on dose response relationships and prognostic values for treatment morbidity and local control. Future works involves the registration of pre- and/or post-application MR images as