Conclusion: Early post-prostatectomy salvage radiation before the PSA reaches 0.2 ng/mL results in superior bPFS compared to those treated later. This strongly suggests that a new definition of post-prostatectomy progression is needed.

Presidential Symposium:

SP-0092
Patient centric approach: myth or fact?
P. Poortmans
UMC St. Radboud, Radiation Oncology, Nijmegen, The Netherlands

Award Lecture: E. Van der Schueren Award

SP-0093
Did I do it right? What was the result? Process and outcomes in radiotherapy
A. Barrett
University of East Anglia, Radiation Oncology, Norwich, United Kingdom

I am honoured to have been invited to give this memorial lecture for which there are three main criteria: it is firstly to honour Emmanuel van der Scheuren, one of the fathers of our society. Secondly it aims to recognise scientific work within the field of radiation oncology and thirdly a contribution to education through the ESTRO programmes, in which I have been privileged to participate for the last 30 years or so.

The first ESTRO annual conference was held in London in 1982 and was memorable with the preparations being agreed between Emmanuel and Mike Peckham, my boss at the Royal Marsden Hospital at the time. I also want to acknowledge how dependent we were on many others for support, particularly among others for Lea, of whom we are thinking with gratitude especially at this time.

Scientific breakthroughs usually build on work that others have done and there are many examples from within the field of radiation oncology which I have experienced particularly in my area of research into whole-body irradiation. We work with the unchanging laws of physics but technology advances all the time and new biological understanding and new agents impact on the way in which we practice oncology.

I will discuss some of the ways in which progress in radiotherapy may occur and consider the factors which determine the impact of clinical trials, with particular reference to the START trials run by John Yarnold and his team. Consensus guidance, such as that contained in the ICRU report 50, has changed practice but there is still much evaluation work to be done in some areas. In our activity currently, process sometimes seems to take precedence over everything else, without the evaluation which would validate it.

ESTRO’s contribution to education has been enormous and it has been exciting to be involved in the teaching courses and publications of ESTRO with its ever-changing and innovative approaches. It is good to note that a new era is starting for the School. Amongst all the changes in current practice the needs of individual patients must remain our priority.

Symposium with Proffered Papers: Hot topics in SABR: time for randomised clinical trials?

SP-0094
Do we need randomised clinical data to justify the use of SABR for primary and oligometastatic cancer?

To be confirmed

SP-0095
Pre-clinical and clinical data on the radiobiological mechanism for the efficacy of SABR
M. Brown
Stanford University School of Medicine, Department of Radiation Oncology, Stanford, USA

Because the results obtained with stereotactic radiosurgery (SRS) and stereotactic ablative radiotherapy (SABR) have been impressive they have raised the question of whether classic radiobiological modeling are appropriate for large doses per fraction. In addition to objections to the LQ model, the possibility of additional biological effects resulting from endothelial cell damage and/or enhanced tumor immunity, have been raised to account for the success of SRS and SABR. However, the preclinical data demonstrate the following:
1) Quantitative in vivo endpoints, including late responding damage to the rat spinal cord, acute damage to mouse skin and early and late damage to the murine small intestine, are consistent with the LQ model over a wide range of doses per fraction, including the data for single fractions of up to 20 Gy.
2) Data on the response of tumors to high single doses are consistent with cell killing at low doses. Thus the dose to control 50% of mouse tumors (the TCD50) can be predicted from cell survival curves at low doses and the number of clonogenic cells in the tumors.

Further the clinical data show:
3) The high local control of NSCLC and of brain metastases by SABR and SRS is the result of high radiation doses leading the high BED. In other words the high curability is predicted by current radiobiological modeling.
4) Because high doses are required in SABR it is not possible to use it in all circumstances (e.g. for tumors close to critical normal structures). But because these high doses are needed...
because of tumor hypoxia there is a major opportunity to improve SABR by the use of hypoxic cell radiosensitzers. Normal 0 21 false false false FR-BE X-NONE X-NONE

SP-0096
Technical developments in high precision radiotherapy: a new era for clinical SABR trials?
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The technological developments in radiotherapy have had a considerable impact on the way stereotactic radiotherapy is delivered. According to confidnece, provided, for example, by the wide availability of image guidance, has permitted more and more institutions to offer SABR as a treatment option. However, some characteristics of SABR plans such as heterogeneous dose prescription, can make the comparison between different institutions and different technological approaches very challenging. In this session, we will review the impact of image guidance strategies, dose calculation algorithms, and normalization guidelines on the planned dose distribution. We will also discuss how these technological aspects should influence how we look at clinical trials of the past, and what should be taken into account when designing new multi-centre trials.

OC-0097
Radiation dose-volume effects for liver SBRT
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Purpose or Objective: SABR is highly effective in providing local control in selected patients with hepatic malignancies. However, various dosing and fractionation schemes with a wide range of toxicity end-points have been reported in the literature. The objective of this work was to review the normal tissue dose-volume effects for liver SBRT and derive normal tissue complication probability models.

Material and Methods: A literature review by the AAPM Working Group on SBRT was performed. Twelve studies that contained both dose/volume and toxicity data from 541 patients with hepatocellular carcinoma, intrahepatic cholangiocarcinoma, and/or liver metastases were identified and analyzed. Patients received a median total dose of 40 Gy (range 18-60 Gy) in 1-6 fractions. The 3 end-points that were chosen for pooled dose-response relationships analysis were grade 3+ liver enzyme elevation as a function of mean liver dose (MLD), G2+ GI toxicity as a function of prescription (RX) or PTV dose, and G3+ GI toxicities as a function of RX/PTV dose. The RX/PTV doses were chosen because doses to specific OARs were not available in many instances. Dose-response modeling was performed using a probit model with maximum likelihood (ML) parameter fitting. The model used the average reported toxicity rates and corresponding dose metrics reported in each included study. The average toxicity rate was then binned into binary outcomes to facilitate ML parameter fitting. Confidence intervals for dose-response curves were calculated using bootstrap method using random sampling with replacement.

Results: Increased MLD was positively correlated with G3+ enzyme toxicity; however, the probit model fitting did not produce a statistically significant dose-response fit. Possible explanations are the sparsity of data, low incidence of complications, variations in baseline liver function and cancer type, and lack of standardization of definitions used for liver enzyme abnormalities. The analysis relating G2+ GI toxicity to RX/PTV dose showed a statistically significant probit model fit. Model fitting parameters were D50 of 47.7 Gy (95% CI 43.0 - 68.8 Gy) and y50 of 0.79 (95% CI 0.34 - 1.25). The plot relating G3+ GI toxicity to RX/PTV dose demonstrated a dose response with a statistically significant probit model fit. Model fitting parameters were D50 of 90.2 Gy (95% CI 67.2 - 156.4 Gy) and y50 of 1.17 (95% CI 0.68 - 1.69). The large D50 value of 90.2 Gy can be attributed to the low rates of G3+ GI toxicity.

Conclusion: Our analysis shows a mean RX/PTV dose of 50 Gy in 3 to 6 fractions has resulted in G3+ GI toxicity risk of < 10%. The QUANTEC liver report recommends MLD limits of 13 Gy in 3 fractions and 18 Gy in 6 fractions for primary disease and 15 Gy in 3 fractions and 20 Gy in 6 fractions for metastases. Our analysis shows that the QUANTEC recommended MLD limits would likely result in acceptable G3+ liver enzyme toxicity risks of < 20%.

SP-0098
Organoids, a disease and patient specific in vitro model system
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The group of Hans Clevers at the Hubrecht Institute discovered a unique marker (LGR5) for epithelial stem cells of the intestine (Barker et al., Nature 2007). Since then, LGR5 has been shown to be a marker of adult stem cells of multiple other tissues such as liver, pancreas, breast, and lung (e.g: Huch et al., Nature 2013; Boj et al., Cell 2014). With the identification of these stem cells and the tools to isolate them, we were able to develop a culture system that allowed for the virtually unlimited, genetically and phenotypically stable expansion of the cells from several animal models including human (Sato et al., Nature 2009, 2011; Gastroenterology 2011; Gao et al., Cell 2014; Boj et al., Cell 2015; Huch et al., Cell 2015; van der Wetering et al., in press Cell). The organoids faithfully represent the in vivo cells also after prolonged expansion in vitro. Hubrecht Organoid Technology (HUB), an entity founded to implement the organoid technology of the Clevers group, in collaboration with the Hubrecht institute, has generated a large collection of patient organoids from a