Five-year clinical outcome of the Phase III ACCORD 12 neoadjuvant trial in rectal cancer

Purpose or Objective: The aim of the ACCORD 12 trial was to compare two different regimens of neoadjuvant chemoradiotherapy (nCRT). No significant difference has been found in main end point (pCR rate). At 3 years there was no significant difference for local control and survival. We report the 5 years outcome.

Material and Methods: Between 11/2005- 07/2008, 598 pts randomized. Inclusion criteria: adenocarcinoma, distal-middle rectum, T3-4, anterior-distal T2 staged using MRI and/or endorectal US. Treatment : CAP 45 : radiotherapy (RT) 45 Gy/25 fr/5 weeks with concurrent capecitabine (800 mg/m² BiD) vs CAPOX 50 : RT 50 Gy/25 fr/5 weeks with Cepacitabine (same) and weekly oxaliplatin (50 mg/m²). A TME surgery was performed after 6 weeks interval. Adjunct chemotherapy was left to each institution.

Results: Median follow-up time was 60 months with 299 pts in each group. In intent to treat analysis main results are shown in table. In 31 pts T4 confounded the local relapse rate was 11.3%[3.8-31.5].A clinical CR in 24 pts was associated with 81% DFS (p<0.0001) and Sphincter saving or organ preservation in 23. Adjunct chemotherapy was given in 253 pts.

OC-0481 Late toxicity and cosmesis after APBI with brachytherapy vs WBI: 5-year results of a phase III trial

Purpose or Objective: The 5-year local control and survival results of the GEC-ESTRO multicentric accelerated partial breast irradiation (APBI) trial have been reported recently. In this analysis we report the 5-year late toxicity and cosmetic results of patients treated with APBI using interstitial brachytherapy (iBT) compared to those who underwent standard whole breast irradiation (WBI) with a tumour bed boost.

Material and Methods: Between April 2004 and July 2009, 1184 patients aged ≥40 years with stage 0, I and II A breast cancer who underwent breast conserving surgery (BCS) were randomly assigned to receive either 50 Gy WBI with tumour bed boost of 10 Gy or APBI using HDR/PDR iBT. Among these, 5-year follow-up records on late toxicities and cosmetic results were available at 969 patients (82%). Five-year prevalences of toxicities graded by the RTOG/EORTC late radiation morbidity scoring scheme were compared using the Fisher’s exact test. The cosmetic results were scored by the patients and treating radiation oncologists using the four-scale (excellent-good-fair-poor) Harvard criteria. The trial is registered with ClinicalTrials.gov, NCT00402519.

Results: There were no grade 4 toxicities. The cumulative incidence of grade (G) 2-3 late skin toxicity at 5 years was 5.7% in the WBI group versus 3.2% in the APBI group (p=0.08), difference: -2.4% (95% CI: -5.0 - 0.2%). Concerning G2-3 late subcutaneous tissue side effects at 5 years the cumulative risk was 6.3% in the WBI group versus 7.6% in the APBI group (p=0.53), difference: 1.3% (95% CI: -4.9 - 4.5%). The cumulative incidence of severe (G3) fibrosis at 5 years was 0.2% in the WBI group and 0% in the APBI group (p=0.46), difference: -0.2% (95% CI: -0.6 - 0.2%). The cumulative incidence of G2-3 breast pain was low in both arms (3.2%
The common ground of the systems is the soft-tissue guidance. As will be shown, MRI offers a wealth of contrasts for anatomical and physiological information but also motion data. Exploiting these data for treatment planning, treatment guidance, and treatment adaptation requires a new workflow with more online decisions, such as contouring, plan adaptation or full re-planning to initialize the treatment. Moreover, the continuous anatomical imaging during radiation delivery enables new direct anatomical triggers for gating and tracking, but equally important, this imaging can be used for dose reconstruction while accounting for intra-fraction motion. The latter is a valuable input for dose response assessment and can also be used for quality assurance (QA) purposes. The QA for these systems need to be revisited, not only because of the new on-line plan adaptations but also due to the fact that the dose is delivered in the presence of a (perpendicular or parallel) magnetic field. This will alter the dose distribution which needs to be verified. Also the radiation detectors are potentially affected and their performance need to be validated (and corrected if necessary) for use in the presence of a magnetic field. This implies new machine QA, patient QA and workflow QA procedures.

The promise of hybrid MRI linac technology is to enable real-time plan adaptations in order to maximize the dose to the target while continuously minimizing the dose to the surrounding organs at risk. The efforts to move from pre-treatment planning to once daily (on-line) plan adaptation and ultimately to real-time plan adaptations will be presented.

In conclusion, the technology of hybrid MRI radiotherapy systems is there while the full clinical value needs to be established. This is an exciting new clinical arena and at the same time poses new challenges for on-line and ultimately real-time, adaptive radiotherapy.

SP-0484
First two years clinical experience with low-field MR-IGRT -system practicality and future implications
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Purpose: We report on the first two years of clinical operation of the first magnetic-resonance imaging-guided radiation therapy (MR-IGRT) program, experiences with patient treatments, and implications for future development and clinical work. We previously reported on initial clinical implementation of this system. - The purpose of this work is to analyze clinical practicality of MR-IGRT and implementation of online adaptive RT.

Methods and Materials: The MR-IGRT system consists of a split 0.35T MR scanner straddling three Co heads mounted on a ring gantry, each head equipped with independent doubly-focused multileaf collimators. The MR and RT systems share a common isocenter, enabling simultaneous and continuous MR imaging during RT delivery. The system is also capable of online plan adaptation where patients can be imaged, planned, verified, and treated all in a single treatment session. To assess the clinical practicality of the system, makeup of treated cancer sites, distribution of available treatment techniques, total number of patients, maximum number of patients treated daily, and the utilization of advanced treatment techniques were evaluated. The system was clinically implemented in January of 2014 and data was collected over a 24 month consecutive period. The adaptive feature was clinically implemented in September of 2014.

Results: During the initial 2 years of the operation, more than 20 cancer sites in 263 patients were treated. The maximum number of daily treatments was 18. Top 3 treated cancer sites were breast, lung, and bladder with 22%, 13%, and 9% of the total treatments, respectively. The utilization