

The 2nd European Society for Radiotherapy and Oncology (ESTRO) Forum

Highlights of the 2nd ESTRO forum, 19th-23rd April 2013, Geneva, Switzerland

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Organised every other year, the European Society for Radiotherapy and Oncology (ESTRO) Forum follows the concept of combining several meetings encompassing the various aspects of the radiation oncology arena: clinical and translational research, brachytherapy, radiation physics, radiation technology and normal tissue effects of radiotherapy. This approach allows clinicians, medical physicists, radiobiologists, radiation technologists and nurses to attend a plethora of symposia, teaching lectures and debates, all directed at fostering interdisciplinarity and encouraging exchange of knowledge and experience between the professionals involved in radiotherapy. In this brief overview we mainly focus on the important clinical findings presented at the conference. All abstracts are freely available at www.estro.org.

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Prostate Cancer

On the first conference day, teaching lectures and abstract presentations focused on prostate cancer. Lebesque presented the long-term results of their dose escalation trial for T1b-T4 localised prostate cancer. Local control at 110 months was significantly higher in patients who received 78 Gy to the prostate, compared to 68 Gy. No significant difference in overall survival (OS) was observed. Results of the randomised phase III HYPRO trial showed that hypofractionation (19 x 3.4 Gy) for localised prostate cancer is well tolerated. No significant difference in late gastrointestinal and genitourinary toxicity was observed compared to the standard fractionation arm (39 x 2 Gy).

Breast cancer

Coles showed the 5-year follow-up results of the largest prospective randomised trial comparing

intensity-modulated radiotherapy (IMRT) to two-dimensional radiotherapy (RT) for early breast cancer. Improved dose homogeneity with IMRT translated into superior overall cosmesis and reduced skin telangiectasia. These findings should encourage centres still using two-dimensional standard RT to implement breast IMRT. Accelerated partial breast irradiation (aPBI) is a new trend in breast RT. In this respect, the results of the ELIOT and TARGIT-A trial, two trials randomising between standard whole breast irradiation (WBI) and aPBI using intra-operative RT, were presented. In both trials significantly more in-breast recurrences were observed with intra-operative RT. However, the authors' conclusions were different. The ELIOT group emphasised the importance of patient selection, as most local relapses were seen in patients with large (>1 cm) or non-luminal A tumours. The TARGIT-A trial con-

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cluded aPBI resulted in acceptable local control rates as the 2% absolute difference was within the pre-set non-inferiority margin of 2.5%. Poortmans discussed the role and future of brachytherapy (BT) in breast cancer. Because of logistic reasons, BT as a boost modality is gradually being replaced by 3D conformal RT with photon beams. However, in a retrospective trial of 1,379 patients, the Louvain group showed a trend towards a higher local control with BT boost compared to electron or photon boosts. Besides BT for boost and aPBI delivery, an appealing new feature lies in its use as secondary breast-conserving treatment after in-breast cancer relapse.

Oesophageal cancer

The poor prognosis of oesophageal cancer could be further aggravated by inadequate clinical target volume (CTV) delineation. Van Hagen showed that approximately half of the locoregional recurrences in the CROSS trials occurred within or at the margins of the radiation field. In the study by Muijs, macroscopic and microscopic tumour spread outside the CTV was present in 11% and 14% respectively. Microscopic tumour extension outside the CTV was associated with adverse OS. Accurate definition of the target volume in oesophageal cancer is complicated by organ motion and tumour shrinkage during treatment. Dedicated research and guidelines addressing these challenges are highly recommended.

Head and neck cancer

One of the major challenges in the field of head and neck cancer is to better understand tumour biology. A lot of research is directed at the human papilloma virus (HPV)-associated tumours, showing that an increased cellular radiosensitivity due to compromised DNA repair capacity was likely to contribute to the improved outcome seen in this subgroup of tumours. Functional and molecular imaging can further increase our understanding of the tumour environment. Preliminary results demonstrated that both diffusion weighted MRI (DWI) and positron emission tomography (PET) can help us in predicting patient outcome. However, these results require further validation. Furthermore, the spatial information provided by these imaging techniques could be used to assess tumour heterogeneity. Combined with the technical ability to target specific regions with higher doses, this information might help us

to further increase tumour control. A range of PET and MRI techniques is currently being investigated in a number of clinical studies. However, it is still unclear how we should use this wealth of imaging data to our advantage and whether the benefit of such a dose painting strategy will be worth the effort. Aside from increasing tumour control, efforts are being made to reduce treatment-related toxicity. Preliminary results showed that IMRT might effectively reduce the dose to the elective lymph nodes and reduce toxicity without compromising outcome. However, further follow-up is needed to ascertain the safety and long-term effect of such a strategy.

Rectal Cancer

Similar to head and neck cancer management, increasing efforts are made to individualise rectal cancer treatment. Up to 30% of the patients achieves a pathological complete response (pCR) after neo-adjuvant chemoradiation. These patients could be candidates for less invasive surgery or for a wait-and-see policy. In this respect, Van Stiphout developed a nomogram for pCR prediction based on longitudinal PET imaging and clinical features. Incorporation of biomarkers, DWI and CT data into such predictive models seems promising. A second issue addressed at this scientific meeting was accurate target volume definition, which is of major importance when high conformal radiation techniques such as IMRT are used. Buijsen showed that PET-based tumour volume delineation correlated with pathological examination and could consequently be used for optimisation of target volume delineations. Furthermore, within the Belgian PROject on Cancer of the REctum (PROCARE), it was demonstrated that a central review platform improved the quality of CTV delineation after RT centres submitted ten patients on a secured server. This study indicated that quality assurance throughout a central review platform was feasible and the online platform with speedy reactivity enabled CTV review before the actual radiation treatment started.

Gynaecological cancer

MRI is currently considered as the gold standard for the assessment of local tumour extension in cervical cancer and is therefore the method of choice for image-guided adaptive brachytherapy (IGABT).

Key messages for clinical practice

- Implementation of intensity-modulated radiotherapy for breast cancer is highly recommended.
- Increased attention is drawn to response prediction and tailored treatment for head and neck and for rectal cancer patients.
- Palliative radiotherapy enhances quality of life in patients who suffer from bone metastases, also in the elderly.

Further evidence on IGABT is expected from the prospective multicentre study EMBRACE, which currently has recruited about 800 patients. Kirchheiner presented the first interim analysis on vaginal morbidity in this study. During the first two years after chemoradiation, severe vaginal morbidity (grade 3 or 4) was rare. However, the probability of mild to moderate morbidity (grade 1 or 2) was high in the first year (78%) and further increased during the second year (92%). The ICRU rectal point dose correlated significantly with the incidence of grade ≥ 2 vaginal morbidity.

Oligo-metastatic disease

In general, the approach to oligo-metastatic disease has become more aggressive. Stereotactic body radiation therapy (SBRT) is emerging as an effective treatment option, extending patients' lifespan with a good quality of life. Lartigau reported local control rates at one and two years of 84.5% and 66.1% respectively and a two-year OS of 70% after SBRT for hepatic and pulmonary metastases. Scorsetti showed patients with unresectable liver metastases treated with SBRT had an in-field response rate of 94% after a median follow-up of twelve months. However, these encouraging results point the need for randomised trials to prove the efficacy of SBRT in treatment of oligo-metastases and to explore the need for systemic therapy along with SBRT.

Palliative treatment

RT has an established role in the treatment of bone metastases. Its value was confirmed in bone metas-

tatised renal cell carcinoma. Even patients who received a tyrosine-kinase inhibitor (sorafenib) benefited from this palliative treatment option. The Dutch Bone Metastases Study showed that patients aged >75 years showed a meaningful response in terms of pain relief after palliative RT. Although these patients had a higher activity level impairment and a worse performance score compared to younger patients, they did not evaluate their overall quality of life as inferior. A single dose of 8 Gy can reduce patients' morphine consumption, thereby additionally improving their quality of life.

Conclusions

During the 2nd ESTRO forum it became clear that the booming biological, imaging and clinical information will challenge the decision capacity of every oncologist in the near future. Prediction models could help clinicians in tailoring treatment to individual patients. However, to create sufficiently accurate prediction models, a massive amount of data and complex analyses are necessary. In daily practice, the increasing importance of image guidance is clear throughout the different tumour types.

A better target volume definition and delineation, improved treatment delivery and optimal and uniform quality assurance will allow for an optimal patient management. However, these improvements require considerable investments in research, equipment and, most importantly, human resources. How to do this in a safe and cost-effective manner will be one of the great challenges of the next decades.