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References:
[12] https://www.gsi.de/bio-pide

Teaching Lecture: Brachytherapy for the pelvic region: status and perspective for the future

SP-0390

Brachytherapy for the pelvic region: status and perspectives for the future - Gynaecology

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Brachytherapy in gynaecological cancers, and especially in cervix cancer, has greatly evolved during the last twenty years. For decades, brachytherapy has relied on x-ray orthogonal acquisitions, and prescription has been a matter of systems and schools, making reporting and comparisons difficult. Based on the developments of afterloaders and treatment planning systems, image-guided adaptive brachytherapy has emerged. This high precision technique combines all modern radiation requirements: image guidance, adaptation to tumor response, and short time treatment.

Ten years ago, the GEC-ESTRO, in a will of harmonizing practices, published recommendations in cervical cancers regarding the definition of target-volumes and the reporting. These recommendations were rapidly adopted worldwide. During the last decade, multiple monocentric series, historical cohorts' comparisons, and a prospective multicentric study (STIC trial) demonstrated high local control rates with a limited morbidity in regard to classical data. These data are about to be confirmed by two large studies led by the Gyn GEC-ESTRO: Retro-EMBRACE and EMBRACE, which will establish MRI-guided brachytherapy as a gold standard.

In addition, clear dose-volume effect relationships have been demonstrated between the modern dosimetric parameters and the probability of achieving local control or facing morbidity. The better knowledge of these correlations allowed the launch of EMBRACE II, a prospective study combing the best radiation modalities (EBRT and IGABT), with optimal and ambitious planning aims. In the near future, the large amount of data collected in the EMBRACE study (> 1500 patients accrued) will allow the development of monograms integrating not only dosimetric parameters, but also criteria on comorbidities, clinical features, and tumor response to external beam radiotherapy. This would be of great help in adapting and personalizing treatment plans. Longer-term prospects include the development of alternative image modalities for guidance, such as endorectal ultrasound, cheaper and more accessible than MRI, or conversely, a more advanced and sophisticated image modality.

Image-guided brachytherapy is also progressively declined in other gynecologic tumors, such as vagina cancer or non-operable endometrial cancer.

SP-0391

Brachytherapy for the pelvic region: status and perspective for the future - prostate

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Prostate brachytherapy allows radiation dose escalation directly into the gland with minimal dose to adjacent rectum and bladder. Over the last decade improvements in brachytherapy technology have refined dose delivery with the introduction of HDR after loading devices, more sophisticated treatment planning systems and the incorporation of functional imaging into the planning process. This teaching lecture will provide an overview of the techniques, indications, and clinical outcomes for both permanent and High Dose Rate prostate brachytherapy. Recent results from randomised clinical trials will be critiqued and emerging indications including focal and salvage treatments discussed.

Symposium with Proffered Papers: Adaptive radiotherapy for coping with anatomical variations: hope or hype?

SP-0392

Overview of clinical practice of ART for pelvic tumours

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Introduction: Variation in shape, position and treatment response of both tumour and organs at risk are major challenges for accurate dose delivery in radiotherapy. Adaptive radiotherapy (ART) has been proposed to customise the treatment to these motion/response patterns of the individual patients, but increases workload thus challenge clinical implementation. This presentation presents a review of the clinically implemented ART in addition to in silico workflows that have been published on pelvic tumours.

Material and methods: Initial identification of papers was based on searches in PubMed. For each tumour site (prostate, gynaecological [gyna], bladder, ano-rectal), the identified papers were screened independently by two researchers following all processes of an ART workflow: treatment monitoring and evaluation, decision and execution of adaptations. Both brachytherapy (BT) and external beam studies were eligible in the review.

Result: The review consisted of 43 clinical studies and 51 in silico studies. For prostate, 1219 patients were treated with offline re-planning workflows, mainly to adapt prostate motion relative to bony anatomy. For gyna 115 patients were treated with online BT re-planning while 25 ano-rectal cancer patients were treated with offline re-planning, all to account for tumour regression detected by MRI/CT. For bladder and gyna, 161 and 64 patients respectively, were treated with library-based online plan selection to account for target volume and shape variations (Figure). In comparison to non-ART, sparing of rectum (prostate and bladder cancer), bladder (ano-rectal cancer) and bowel cavity (gyna and bladder cancer) was reported with ART.