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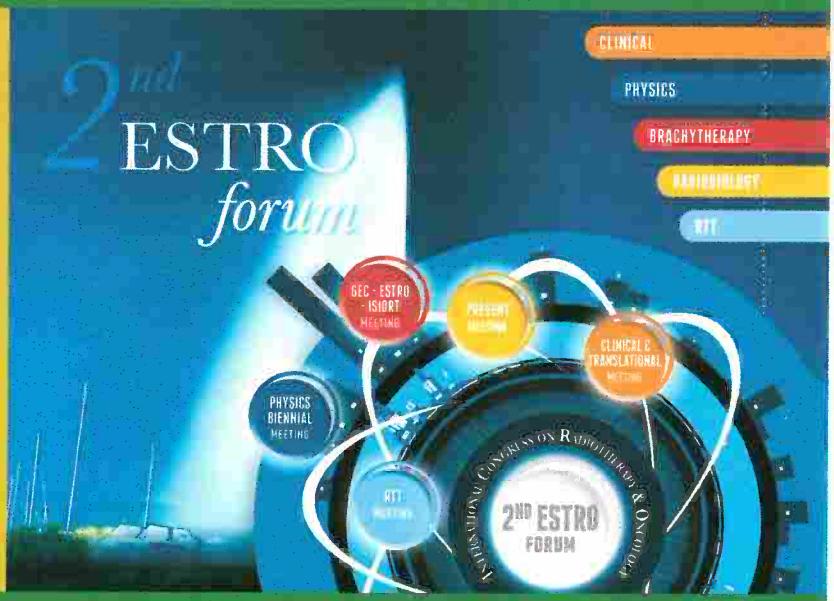

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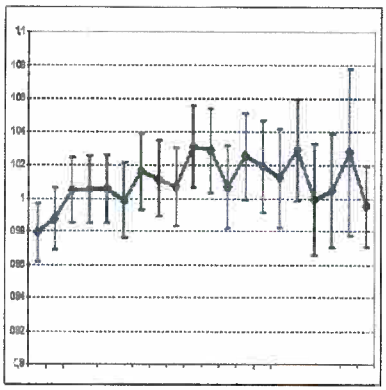

Fig. 1: Least square means of RV by categorical patient order (corrected for CTV original and centre).

Conclusions: Central review significantly improved the uniformity of the CTV delineation in the first ten rectal cancer patients submitted per centre. The high agreement on CTV delineations from the beginning of the review period and the fact that some centres submitted a low number of cases may explain the lack of a learning curve over the whole period. Further analysis of the data can highlight current ambiguities in the delineation guidelines and can help us in further improving these.

OC-0421

Quality indicators in radiation therapy for rectal cancer. A population based study in Southern Switzerland 2011-12

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Purpose/Objective: Research on quality of cancer care (QoCC) during the last decade has demonstrated that the increase in knowledge on treatments with proven efficacy does not directly translate into optimal treatment delivery to patients. On the other hand, data describing the proportion of patients with rectal cancer (RC) who benefit of up-to-date evidence-based diagnostic-treatment procedures are still scarce in the literature. Aims of the present study are: 1) to describe the methods used for the selection of RC specific quality indicators (QI); 2) to analyse three QI concerning patients diagnosed with a new RC in Southern Switzerland and receiving neo-adjuvant radiation therapy (RT).

Materials and Methods: QI have been developed in the context of a QoCC project as follows: seek and nomination of multidisciplinary RC Working Group, selection of QI on an evidence-based manner, choice of QI through a two-rounds Delphi-process and validation of final QI by an international Advisory Board (consensus ≥ 70%). Patients with RC incident from 2011 to 2012 were retrieved from the files of Ticino Cancer Registry. According to ICD-O-III tumour classification, epithelial tumours were included, but neuroendocrine, GIST, sarcoma, lymphoma. Additional information was extracted from the single pathology and RT records in both public and private hospitals. QI will be presented as proportion with the corresponding 95% confident intervals. The numerator and the denominator will be defined according to the definition of each QI.

Results: We initially considered 51 rectum-specific QI, of which 15 were RT-related. At the end of the whole process, 21 QI were finally validated (RT-related, N=9). Results of patients diagnosed with RC in 2011-2012 will be presented for the following 3 RT-related QI: *1) proportion of patients with RC for which the request for the pathological examination includes the information of neo-adjuvant RT (in patients with RC undergoing neo-adjuvant RT and surgery); 2) proportion of patients with locally advanced RC undergoing neo-adjuvant RT (in patients with locally advanced RC undergoing surgery; 3) proportion of patients with RC and undergoing neo-adjuvant RT operated within 6-8 weeks after the end of neo-adjuvant RT (in patients with RC undergoing neo-adjuvant RT and surgery).*

Conclusions: QI are mandatory not only for clinicians, but also for stakeholders and patients. QI should be defined, developed and tested with scientific evidence-based rigor in a careful and transparent manner. The present QI study is based on expertise and active involvement of local health care providers and international experts representing all major disciplines (epidemiology, pathology, radiology, gastroenterology, surgery, radiation oncology, oncology, nuclear medicine), thus increasing quality, acceptance and translation of results into the daily clinical practice.

OC-0422

Towards a validated decision tool for rectal cancer based on sequential PETCT imaging before and during treatment

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Purpose/Objective: To tailor treatment for locally advanced rectal cancer (LARC) an early accurate prediction of tumor response after preoperative chemoradiotherapy (CRT) is required. In literature, response prediction for LARC is mainly based on PET-imaging, but these studies are small and rarely validated. This study provides a prediction model based on a multicentric analysis of LARC response with clinical and sequential PET data of before and during treatment from three different institutes.

Materials and Methods: In total, 112 patients from one institute were used to train the prediction model.The model was tested on respectively 78 and 28 patients from two different institutes. All LARC patients were prospectively accrued between 2007 and 2011 and received long-course radiotherapy (45-55 Gy) and concomitant chemotherapy. Two PETCT scans were made, pretreatment (day0) and halfway treatment (day 15). Tumors were semi-automatically contoured using a signal-to-background based threshold method. Extracted PET features of the two time points were SUV_{mean}, SUV_{max}, metabolic tumor volume (MTV) and maximal tumor diameter. Response indices between day0 and day 15 were calculated. They were analyzed together with age and gender of the patient and cT- and cN-stage. The endpoint for prediction was pathologic complete response (pCR) defined as ypT0N0, based on pathology reviews of the resected specimen. Eleven patients who were also included in a wait-and-see study were considered to have pCR when they were recurrence free for at least 1 year. Significant predictors from a univariate Mann-Whitney U test were included in a multivariate model based on logistic regression to predict tumor response. Performance of the model was expressed as a bootstrapped AUC (Area Under the Curve) of the Receiver Operating Characteristic (ROC).

Results: The data distributions, number of missing values and pCR rates were similar between the institutes (Table). Based on the univariate analysis and outcome of the logistic regression, cT- and cN-stage, maximal diameter at day15 and response index of SUV_{max} were selected as predictors. A nomogram was deducted from this model (Figure), resulting in performances of 0.78 for the training dataset and 0.69 and 0.64 for the smaller validation datasets.

Dataset	Type	N	Missing	% pCR	AUC [95% C.I.]
Institute 1	Training	112	0.5%	21.4%	0.78 [0.67-0.85]
Institute 2	Validation	78	1.8%	23.1%	0.69 [0.55-0.82]
Institute 3	Validation	28	0.7%	25.0%	0.64 [0.40-0.85]

Conclusions: Sequential PET-imaging has predictive power for response after chemoradiotherapy in LARC patients. Application of the developed model in other institutes is less accurate, but still useful for tailored decision making. When patients are assigned to risk groups for an uncomplete response, high risk patients may be candidates for radiotherapy boost and adjuvant chemotherapy strategies, while the low risk patients may be followed-up with a wait-and-see policy,