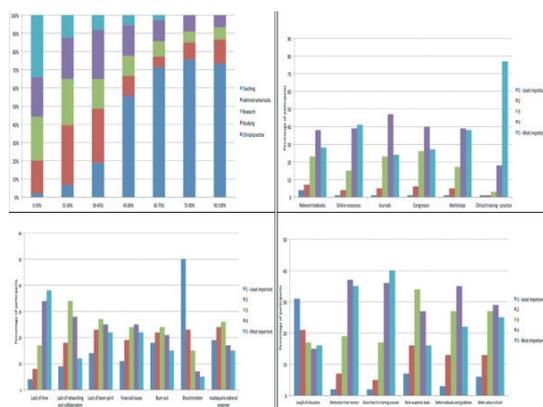


S451

I	Chiropractors n (%)	Physicians n (%)	Radiobiologists n (%)	Radiation Therapists n (%)	Total n (%)
Total	210 (47)	135 (29)	10 (2)	108 (24)	463
Sex					
Male	103 (49)	65 (48)	8 (80)	41 (38)	217 (47)
Female	107 (51)	70 (52)	2 (20)	67 (62)	246 (53)
Age					
Mean	33.3	30.8	36.6	30.7	33
Range	24-40	23-40	31-40	21-40	21-40
Country					
France	30 (14)	23 (17)	2 (20)	40 (37)	95 (21)
Spain	21 (10)	44 (33)	2 (20)	13 (12)	80 (17)
The Netherlands	27 (13)	10 (7)	1 (10)	11 (10)	49 (11)
Germany	26 (12)	10 (7)	3 (30)	6 (6)	45 (10)
Italy	24 (11)	7 (5)	-	8 (7)	39 (8)
Portugal	8 (4)	2 (2)	-	10 (9)	20 (4)
Greece	7 (3)	10 (8)	1 (10)	2 (2)	20 (4)
Belgium	11 (5)	-	-	3 (3)	16 (3)
United Kingdom	3 (2)	4 (2)	1 (10)	-	8 (2)
Slovenia	1 (0)	9 (7)	-	-	10 (2)
Overseas	6 (3)	1 (1)	-	-	7 (2)
Norway	2 (2)	1 (1)	-	-	3 (1)
Sweden	-	6 (4)	-	-	6 (1)
Others	41 (20)	8 (6)	-	13 (12)	62 (13)

Table 1. Participants' characteristics



Conclusion

This is the first study to examine the different RO education and training organizational systems in Europe. Large differences in structure and duration of national education programs were found, along with perceived quality of training and needs across Europe within each speciality. These results show the necessity of a tailored discussion about the different strategies to reduce the diversity in terms of educational programs and to enhance the potential contribution of ESTRO in improving the present scenario.

PO-0861 Stereotactic Ablative Radiotherapy For Oligometastatic Patients With Isolated/Limited Lymphnodes

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Purpose or Objective

To evaluate the feasibility and the early side effects of Stereotactic Ablative Radiotherapy (SABR) for isolated or limited lymph nodes in oligometastatic (OM) cancer patients

Material and Methods

Between March 2014 and January 2017, 95 lesions, in 45 OM patients with isolated or limited lymph nodes involvement, staged on PET/CT, were treated with SABR, delivered using Volumetric Modulated Arc Therapy (VMAT) and flattening filter free (FFF) beams. Prescribed doses and schedules of fractionation varied, ranging from 35 Gy (10 fractions) to 45 Gy (6 fractions). Most commonly used schedules were 36 Gy in 6 fractions and 35 Gy in five fractions.

Toxicity were evaluated using CTCAE v.4.0. Local control was scored by means of PET/CT scan

Results

The median age was 66 years (38-91 years) and 35 patients out of 45 were male. Median follow-up was 12

months (4-32 months). Major primary tumor sites included prostate (55%) and colorectal (13%). The node sites included 49% abdominal, 41 % pelvic, 5% thoracic, 3 % cervical, and 2 % axillary and internal mammary. PET/CT was performed with 18F-FDG in 32/95 lesions (34%), Choline in 40/95 (42%), Ga68-PSMA in 23/95 (24%). All patients completed the treatment without interruptions. With a median follow-up time of 12 months, acute toxicity was minimal: 3/45 (7%) patients reported diarrhea grade 1, 1/45 (2%) showed fatigue grade 1 and 1/45 (2%) showed erythema G1. No acute Grade 2 or higher and no late toxicity were recorded. Metabolic response on PET/CT was evaluated as follows: complete response in 85/95 (90%) of treated lesions, partial response in 1/95 (1%), stable disease in 4/95 (4%), progression in field in 5/95 (5%). Thus, overall response rate was 95%. During follow up, failure were reported as follows: in a single case we observed in field failure only, after 7 months. In other 15 patients we recorded out of field failure. In 3 patients synchronous in field/ out of field failures were found.

Conclusion

PET/CT guided SABR is a feasible approach for isolated or limited lymph node recurrence in OM patients, offering excellent in-field tumor control with low toxicity profile. Longer follow-up is needed to assess late toxicity and the influence of local control on clinical outcomes.

PO-0862 Prognosis predicting factors for thyroid eye disease in radiotherapy concurrent with pulse therapy

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Purpose or Objective

To clarify controversial factors predicting prognosis after radiotherapy for thyroid eye disease (TED).

Material and Methods

Retrospective analyses were performed on 103 TED patients who were treated with orbital radiotherapy concurrent with steroid pulse therapy between August 2005 and March 2017. The majority of the patients received three courses of pulse treatment, each consisting of three consecutive days of methylprednisolone administration (10mg/kg/day). While receiving the pulse treatment, the patients concurrently received a total dose of 20 Gy in 10 fractions of radiotherapy. To evaluate the response to the treatments, we used magnetic resonance imaging (MRI). The evaluation region was defined as the maximum area in the coronal section of the extraocular muscle belly, and the region of interest (ROI) was set along its margin in T2-weighted image. The signal intensity ratio of the extraocular muscle and the cerebral white matter was also measured in short-tau inversion recovery image. In several cases where the MRI evaluation was difficult, the effect was judged by the clinical activity score (CAS).

Results

The response rate at the initial treatment evaluation was 85.4%; the rates of complete response, partial response, and stable disease were 34.9%, 50.5%, and 14.6%, respectively. All mean values of extraocular muscle thickness, intensity ratio, and ocular proptosis improved significantly, and so did the median of CAS. During a median follow-up of 24.5 months, the 2-year relapse free rate (RFR) was 83.9%. In univariate analysis, a better RFR was significantly associated with the absence of optic neuropathy (85.8% vs. 66.3%, $p = 0.0298$), lower thyroid stimulating antibody (TSAb) rates at the blood sample before treatment (100.0% vs. 68.0%, $p < 0.001$), and higher standard deviations (SDs) of the ROI (97.7% vs. 70.0%, $p < 0.001$). In multivariate analysis, the TSAb rate

and SD affected the RFR independently. When 2700 were set as a cutoff at 24 months in the TSAb rate and 100 in the SD, sensitivity and specificity were 83.3% and 85.1% in the former, and 92.3% and 79.5% in the latter. In the longitudinal assessment by the TSAb rate, the SD, and an original marker of combining the two, area under the curve values were 0.85, 0.71, and 0.90 at 6 months; 0.89, 0.81, and 0.93 at 12 months; and 0.88, 0.86, and 0.93 at 24 months, respectively (Fig. 1). As adverse events, 19 cases of deterioration of dry eye, 3 cases of hepatitis, diabetes, and cataract each, and 1 case of gastric ulcer were reported.

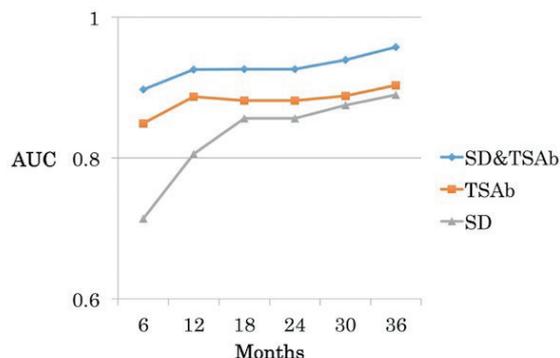


Fig. 1. The longitudinal result of area under the curve (AUC) among the TSAb, the SD, and an original marker of combining.

Conclusion

Orbital radiotherapy concurrent with steroid pulse therapy on TED was an effective and safe treatment. High TSAb values and low SD values are the risk factors of a relapse; especially, the TSAb rate showed a high discrimination ability for early relapse. A marker combining TSAb rates and SDs may be useful in predicting relapse more accurately.

PO-0863 "First in man" treatments with the MRI-linac provide clinical proof of the concept

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Purpose or Objective

- To report the first treatments ever performed with the MRI-linac; an integrated system of a 7 MV linear accelerator and a diagnostic quality 1.5 T MR Scanner.
- To confirm the pre-clinically demonstrated technical accuracy and safety of MRI based radiation targeting with this system in the clinical setting.

Material and Methods

A "First in man" (FIM) study was performed intending to include 5 patients with painful bone metastases in the lumbar spine. Prior to the MRI-linac procedure regular diagnostic MRI and planning CT scans were performed and affected vertebrae and spinal cord were delineated. MRI-linac treatment plans and regular CBCT-linac back-up plans were generated. As part of the quality assurance program phantom based dosimetry checks of the individual pre-treatment MRI-linac plans were performed on the MRI-linac prior to each

treatment. For each MRI-linac procedure online treatment planning was used to generate the individual treatment plan. Plans were based on the online MRI information using deformable registration of pre-treatment contours, with potential manual adaptation by the clinician if required. A single dose of 8 Gy (intended to relieve pain) was applied using 3 or 5 field IMRT techniques. For each MRI-linac procedure, independent EPID megavolt target verification was performed during beam delivery, with phantom measurements immediately thereafter, in order to verify geometric targeting accuracy and dosimetric accuracy of the system.

Results

Patients were included into FIM from mid May to mid July 2017 with a current follow-up range 13 - 20 weeks. Four of them were treated on the MRI-linac as intended without any relevant technical problems. MRI-linac image quality and geometric fidelity matched the images obtained on the diagnostic MRI. Comparison of pre-treatment, online and post-treatment verification of the radiation beam revealed a dosimetric accuracy within the range of 0.0 -1.7 % and a geometrical targeting accuracy of 0.2-0.4 mm. The individual MRI-linac procedures took less than 50 minutes (range 34-48) and were well tolerated by the treated patients. No unexpected adverse events have been reported so far and pain relief was achieved as intended. The fifth patient, after having signed informed consent, experienced severe disease progression with neurological impairment and was therefore no longer applicable for treatment within this first clinical study. This rapid progression was diagnosed during the pre-treatment MRI workup and required emergency intervention.

Conclusion

The concept of MRI-linac (including high field strength magnetic resonance imaging) has successfully been proven in the first clinical setting and reveals an outstanding level of MRI image quality as well as dosimetric and geometric accuracy of the radiation beam. Online MRI-guided treatment planning and MRI based position verification during dose delivery is feasible and allows treatment decisions based on the actual anatomy. The MRI-linac shows a stereotactic quality targeting accuracy.

PO-0864 Long-term impact on contouring skills can be achieved by online learning. An ESTRO-FALCON-IAEA study

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