Abstract 2224 — Table 1: Clinical results comparing AC and EC

ORGANS	A% for EC	B% for EC	A% for AC	B% for AC	Mean AC Dice (%)	Mean EC Variability Dice (%)
Aorta	49	34	52	48	72	/
Bronchial_tree	54	46	40	50	78	70
Esophagus	50	44	81	19	84	88
Heart	30	41	48	48	95	95
Brachialplexus_L	55	32	47	42	66	/
Chestwall_L	5	10	44	38	90	90
Kidney_L	67	33	86	14	98	/
Lung_L	78	19	85	15	99	/
Liver	46	50	81	19	98	/
Pulmonary_arteries	31	54	64	33	86	83
Brachialplexus_R	44	44	41	47	69	/
Chestwall_R	9	6	57	32	90	91
Kidney_R	67	33	89	11	96	/
Lung_R	76	24	77	19	99	/
Spinal_cord	50	38	89	7	89	/
Spleen	67	33	84	15	94	93
Stomach	33	67	62	31	90	88
Trachea	64	26	45	40	91	88

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2225

A Multi-Centric Evaluation of AI-Driven OARs Low Field MRgRT Pelvic /Abdomen Contouring

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Purpose/Objective(s): Organs at risk annotation is a strong bottleneck of Magnetic resonance imaging guided radiotherapy (MRgRT) in the context of adaptive treatment. It is a time-consuming task that reduces patient throughput (20% of the fraction duration dedicated to contouring) while suffering standardization and reproducibility across physicians, hampering the accuracy of high precision MRgRT and diminishing its adoption potential. AI-contouring becomes a game changer in radiation oncology since it is able within seconds to provide a full OAR delineation that could be close to clinical acceptance with little modifications. The aim of this study is to evaluate the performance of AI-contouring within a multi-centric cohort for patients with pelvic / abdominal tumors treated with low field (0.35T) MRgRT.

Materials/Methods: In the context of this study, a CE/FDA cleared anatomically preserving ensemble deep-learning architecture contouring solution was considered. The adopted solution was trained using more than 350 0.35T MR fully annotated pelvic cases according to the ESTRO guidelines and 270 annotated abdomen fractions samples. A retrospective cohort involving 42 test cases coming from seven different institutions (US: 1, EU: 5, AS: 1) was considered. The clinical delineations used for treatment planning from expert physicians/ medical physicists were associated with these cases.

Results: It appears that treatment practices can be very different between institutions since the use of OAR constraints were far from being uniformly adopted. Bladder & liver dosimetry constraints were the most frequently used (100% & 90%) while abdominal aorta and seminal vesicle were the least adopted (24% & 15%). The average DSC between Clinical experts and AI annotations was 78% across all structures. Bladder and left/right kidney were the structures for which the highest DSC were observed (93%, 91% & 90%), while penile bulb and duodenum were the ones with the lowest agreement (54% & 59%). AI solutions seem to have important discrepancies with clinical contours in organs on which either the volume is small or there are practice-related uncertainties with respect to the definition of beginning and the end of the structure. For quantitative evaluation, dice similarity coefficients (DSC) and 95% Hausdorff distances (HD95) were calculated.

Conclusion: This retrospective multi-centric study demonstrates that AI-driven contours could be a reliable alternative to clinical contours offering performance that appears to be close to the human expert for many of the structures while increasing throughput and offering automatization & standardization.

Abstract 2225 — Table 1

Organ	Average dice (%)	Average HD95 (mm)
Anal canal	65	6
Bladder	93	3
Left femoral head	84	10
Penile bulb	54	7
Prostate	83	6
Rectum	81	15
Right Femoral Head	85	8
Seminal Vesicle	81	3
Sigmoid	77	13
Abdominal aorta	74	42
Duodenum	59	45
Large bowel	64	57
Left kidney	91	5
Liver	89	29
Pancreas	48	27
Right Kidney	90	8
Stomach	84	22
Vena cava inferior	72	22

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