Adaptive VMAT Radiotherapy to Avoid Brachytherapy in Cervical Cancer Treatment

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Abstract 2582 — Table 1: Comparative Doses to HR-CTV and OARs

	MRI (first fraction) Mean±SD	CT-1 (first fraction) Mean±SD	CT-2 (Second fraction) Mean±SD	MRI vs CT-1 (p Value)	MRI vs CT-2 (p Value)	CT-1 vs CT-2 (p Value)
HR-CTV D90 (%)	108.86± 24.21	98±23.18	106.86± 17.36	0.029	0.686	0.07
Bladder D2cc (Gy)	6.05±1.39	5.73±1.12	5.77±0.86	0.296	0.315	0.847
Bladder D1cc (Gy)	6.59±1.74	6.23±1.41	6.27±0.883	0.287	0.374	0.880
Bladder D0.1cc (Gy)	8.18±3.14	7.55±1.79	7.68±1.08	0.231	0.441	0.719
Rectum D2cc (Gy)	4.14±1.04	3.91±0.97	4.18±0.85	0.329	0.866	0.229
Rectum D1cc (Gy)	4.32±1.08	4.32±1.2	4.55±0.96	1	0.424	0.381
Rectum D0.1cc (Gy)	5.32±1.43	5.27±1.42	5.36±1.14	0.880	0.900	0.754
Sigmoid D2cc (Gy)	3.73±1.42	3.64±1.29	4.09±1.8	0.576	0.176	0.125
Sigmoid D1cc (Gy)	4.14±1.58	4±1.51	4.55±1.8	0.561	0.165	0.09
Sigmoid D0.1cc (Gy)	5.05±2.1	6.86±1.85	5.86±2.23	0.348	0.050	0.584

*Doses for OARs are for a prescription of 7 Gy for each fraction

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Purpose/Objective(s): Concomitant chemoradiation (CRT) is the standard of care to treat patients with stage Ib1- IVb carcinoma of the cervix. External beam radiotherapy (EBRT) and brachytherapy are used. There are potential benefits of VMAT technology both in terms of an escalation of dosage and a decrease in toxicity. Non-brachytherapy treatment is an evolving alternative approach which requires adaptive external beam radiotherapy treatment to improve its accuracy and to avoid geographical miss, yet it is still unclear whether this approach could yield further improve outcomes.

Materials/Methods: A Prospective study was conducted between May 2015 and May 2021. Thirty-two patients with locally advanced cervical cancer (LACC) stage Ib1-IVa and three patients with stage IVb who underwent CRT using EBRT and simultaneous integrating boost (SIB) were evaluated. The median age was 53,2 years (30-76) with prevalence of squamous cell carcinoma histology (80 %). All patients had regular follow-up by gynecological examination, pelvis MRI and 18FDG-PET/CT scan. The prescribed radiation dose ranged between 60,0 to 96,6 Gy to the gross tumor volume (GTV). None of these patents received brachytherapy treatment, and eight (22,8%) patients received no chemotherapy due to other reasons.

Results: A total of 35 patients were recruited. The median follow-up was 38 months (range: 2-83 months). The 1, 3 and 5-year overall survival and local control were 91, 78, 74% and 100, 97, 94%, respectively. Six patients had disease progression. The median time to progression was 9 months (range: 3-16 months). Early and late toxicities were acceptable without severe events.

Conclusion: Non brachytherapy CRT treatment of LACC is feasible and seems that escalating the dosage provides better local control, which might be translated to favor progression free and overall survival. No serious toxicities occur and studies to establish this method are mandatory.

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Endoscopic Assessment of Radiological Stage IVA Cervical Cancer: A Bivariate Meta-Analysis Supporting an Evidence-Based Staging Algorithm

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Purpose/Objective(s): To optimize the use of confirmatory endoscopic exams (cystoscopy/proctoscopy) in the staging of locally advanced cervical cancer (LACC), the present study evaluates the predictive value of radiological exams (CT and MRI) to detect bladder/rectum invasion.

Materials/Methods: A systematic search of databases (PubMed and EMBASE) was performed (CRD42021270329). The inclusion criteria were: a) cervix cancer diagnosis; b) staging CT and/or MRI (index test); c) staging cystoscopy and/or proctoscopy (standard test); and d) numbers of true positives (TP), true negatives (TN), false positives (FP), and false negatives (FN) provided. A random-effects bivariate meta-analysis of positive predictive value (PPV) and negative predictive value (NPV) was performed with moderator analyses by imaging modality (CT and MRI) and prevalence.

Results: Nineteen studies met the inclusion criteria, totaling 3480 and 1641 patients for bladder and rectum analyses, respectively. For bladder invasion (prevalence ranged from 0.9% to 34.5%), the overall PPV was 45% (95% confidence interval, 33%-57%, based on 19 studies). Per subgroup, the PPV was 31% for MRI/prevalence ≤6%, 33% for CT/prevalence ≤6%, and 69% for CT/prevalence >6%. For rectal invasion (prevalence ranged from 0.4% to 20.0%), the overall PPV was 30% (95% confidence interval, 17%-47%, based on 8 studies). Per subgroup, the PPV was 36% for MRI/prevalence ≤1%, 17% for MRI/prevalence >1%, and 38% for CT/prevalence >1%. The overall NPV for bladder invasion and rectal invasion were 98% (95% confidence interval, 97%-99%) and 100% (95% confidence interval, 99%-100%), respectively. Considering prevalence and radiological modality, the point estimate of NPV varied from 95% to 100% for bladder invasion and from 99% to 100% for rectum invasion.

Conclusion: Due to low PPV (<50%) of radiological staging, endoscopic exams may be necessary to correctly assess radiological stage IVA LACC. However, they are not necessary after negative radiological exam (NPV ≥95%).

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Impact of Para-Aortic Lymph Node Count on Survival in Patients with Cervical Cancer and Para-Aortic Lymph Node Involvement Treated with Definitive Radiation Therapy

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