Materials and Methods: We analyze 51 patients (48, male; 3 female), aged from 42 to 84 years; diagnosed of lung tumors, and treated with external beam radiotherapy.
Radiotherapy treatment was delivered with linear accelerator CLINAC 2100 (Varian). 3D planning was performed with Pinnacle System software (Phillips). For the analysis we select the Dose-Volume Histogram (DVH) parameters mean dose (Dmean) and maximum dose (Dmax).
Acute esophageal toxicity was evaluated at end of treatment with the RTOG acute side effects scale
Results: Median total dose was 60Gy (45-63 Gy). Mediastinal median dose was 50Gy (45-60Gy)
Twenty three patients (45%) did not have esophageal toxicity at end of radiotherapy. Grade 1 was achieved in 23 patients (45%), and grade 2 in 5 (10%) (Fig. 1)
Esophageal Dmean:
Dmean range: 23.6-33.2Gy. The median of Dmean in patients without toxicity was 31.6 Gy; in patients with toxicity (grade 1 or 2): 33.2 Gy. This difference was not statistically significant (p=0.77) (Fig. 2)
Esophageal Dmax:
Dmax range: 51-63Gy. The median in patients without toxicity was 58Gy; and median in patients with toxicity (grade 2 or 3): 59.2Gy. These differences were not statistically significant: p=0.289

Fig. 1. Toxicity at end of radiotherapy

Fig. 2.- Distribution of toxicity and Mean Dose (Dmean)

Conclusions: Esophageal toxicity was mild: 45% of patients did not develop any grade of dysphagia.
The median Dmean in the esophagus in patients who developed some degree of toxicity was slightly higher than in patients with no toxicity; however, these differences were not statistically significant, so Dmean can’t help us to predict esophageal toxicity.
The median Dmax achieved in the esophagus was slightly higher in patients who experienced toxicity at the end of treatment, but the differences with patients without toxicity were not statistically significant, so we can conclude that the Dmax parameter is not useful for esophageal predict toxicity.
In our study the DVH parameters Dmean and Dmax have not been useful in predicting toxicity in patients with external beam radiation. We can’t establish these parameters as predictors of esophageal toxicity.
A higher number of patients or the analysis of other DVH parameters could reach a level of statistical significance that allowed relate esophageal toxicity.

EP-1634
Comparison of field-in-field radiotherapy with conventional radiotherapy for unilateral cervical lymphoma
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Purpose/Objective: Many studies have compared field-in-field (FIF) radiotherapy with conventional radiotherapy using the wedge technique in breast cancer, but a study comparing the effectiveness of these modalities in cervical lymphoma has not yet been reported. The current study was conducted to evaluate the clinical benefit of the FIF technique compared with conventional radiotherapy with physical wedges for the treatment of unilateral cervical malignant lymphoma.

Materials and Methods: Two treatment plans against unilateral cervical malignant lymphoma were generated to 32 patients: for the FIF technique and for the wedge technique. The clinical target volume included the ipsilateral neck node levels I–VI, the parotid area, and the volume of pre-chemotherapy involved lymph nodes plus a 5-mm margin. A total dose of 30 Gy in 15 daily fractions of 2 Gy was planned.
To compare the two treatment plans, dose-volume histograms of the planning target volume (PTV), the thyroid, submandibular gland, carotid artery, mucosa, spinal cord, and surrounding normal tissue, and monitor unit (MU) were analyzed. Analyses were performed using the Wilcoxon signed rank test to determine if there was a significant difference in any of the parameters examined.
Results: The FIF technique showed significant reduction in the maximum doses and the volume receiving >107% of the
prescribed dose (V107) of PTV (p < 0.001), and significant gain in the homogeneity index of PTV (p < 0.001). The mean dose of the thyroid, submandibular gland, and carotid artery were all significantly lower for the FIF technique than wedge technique (p < 0.001), as was the maximum dose of the spinal cord (p < 0.001). The MU was lower for the FIF technique (p < 0.001).

Comparison of DVF preservation and MU between the FIF technique and wedge technique (mean ± standard deviation)

<table>
<thead>
<tr>
<th></th>
<th>FIF</th>
<th>Wedge</th>
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<tbody>
<tr>
<td>PTV</td>
<td>V5 (%)</td>
<td>85.81 ± 0.10</td>
</tr>
<tr>
<td>V10 (%)</td>
<td>105.4 ± 1.76</td>
<td>105.5 ± 1.07</td>
</tr>
<tr>
<td>Dose (Gy)</td>
<td>32.45 ± 0.74</td>
<td>33.11 ± 0.78</td>
</tr>
<tr>
<td>MU (%)</td>
<td>84.87 ± 0.17</td>
<td>78.50 ± 10.76</td>
</tr>
<tr>
<td>Thyroid</td>
<td>Dose (Gy)</td>
<td>28.90 ± 1.57</td>
</tr>
<tr>
<td>SG</td>
<td>Dose (Gy)</td>
<td>29.88 ± 1.55</td>
</tr>
<tr>
<td>CA</td>
<td>Dose (Gy)</td>
<td>20.25 ± 1.77</td>
</tr>
<tr>
<td>Spinal cord</td>
<td>Dose (Gy)</td>
<td>30.63 ± 0.93</td>
</tr>
<tr>
<td>Muscosa</td>
<td>Dose (Gy)</td>
<td>31.50 ± 0.00</td>
</tr>
<tr>
<td>SNT</td>
<td>V0 (%)</td>
<td>8.39 ± 0.10</td>
</tr>
<tr>
<td>MU</td>
<td>22.31 ± 21.49</td>
<td>343.59 ± 22.73</td>
</tr>
</tbody>
</table>

Conclusions: Compared with the wedge technique, the FIF technique improved dose homogeneity of the PTV, reduced the dose to normal structures, and was associated with fewer MUs in the treatment of patients with unilateral cervical malignant lymphoma.

EP-1635
Comparison of IMRT, three-dimensional conformal and combined planning techniques in lung cancer radiotherapy
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Purpose/Objective: External radiotherapy constitutes essential components of inoperable early and locally advanced lung cancer treatment. Dosages of non-tumor lung tissue located in our treatment volume, esophagus, heart and medulla spinalis(MS) must be adjusted carefully. Intensity modulated radiotherapy(IMRT)'s place in treatment is controversial due to increasing lung volume which receives low dose in lung cancer radiotherapy. It is supposed that usage of combined radiotherapy technique would decrease lung toxicity, on the other hand, provide opportunity to lower MS and esophagus dosages. In our study, we aimed to compare the dosages that standard tissue and target volumes took in IMRT, three-dimensional radiotherapy(3D CRT) and combined radiotherapy (Anterior-Posterior/Posterior-Anterior +IMRT) planning with patients with lung cancer.

Materials and Methods: We planned our study to compare three different radiotherapy techniques used in planning of 13 lung cancer patients (1 in stage 1B, 1 in stage 2A, 1 in stage 2B, 7 in stage 3A, 3 in stage 3A) diagnosed in our clinic. We prepared an IMRT, 3D CRT and combined radiotherapy plan to give our target volume 60 gy with 2 gy/ fraction day. We identified ipsilateral, contralateral and total lung, heart, esophagus and MS as volumes at risk. We calculated ipsilateral, contralateral, total lung volume (V15, V10, V20, V30, V40; mean lung dose(MLD), maximum dosages of MS and esophagus, volume of heart taking 60 gy, dosage that 95% of intended target volume takes (PTV95), dosage of the volume which is gained by subtracting PTV volume from total body volume, and we compared the values we had found.

Results: It is assigned that PTV95 of 13 patients that we counted in our study were indifferent statistically. Ipsilateral V5, V30, V40 values in IMRT tecnique, were found lower than combined tecnique and 3D CRT tecnique (p<0.05). The lowest value was attained with combined plan tecnique for ipsilateral V20 value, and it is determined to be different than two other tecniques (p<0.05). In contralateral V5, V10, V20 and V30 lung volumes, the lowest values were attained with combined tecnique (p<0.05). It is found that V5, V10 and V20 values are low in combined plan, V30 and V40 values are low in IMRT tecnique, and this decline is found to be statistically significant. No differences found in esophagus maximum dosage and heart V60 values. With MLD comparison, it is found that combined tecnique is superior to IMRT and conformal tecnique.

Conclusions: Dosage, that contralateral, total lung critic volumes and rest of the body volume take with combined plan tecnique in inoperable early stage and locally advanced lung cancer radiotherapy, decreases compared to IMRT and 3D CRT; dosages of organs at risk such as MS, heart, esophagus can be hold in tolerance limits. Outcomes of our study support the use of combined plan tecnique in inoperable and locally advanced lung cancer for diminishing side effects.

EP-1636
Feasibility study of the use of SmartAdapt to evaluate the dosimetric impact of organ deformation in prostate case
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Purpose/Objective: In radiotherapy, deformation of rectum and bladder due to intrinsic factors such as faecal content and bladder filling have an impact on the delivered doses to the prostate. Each of these pelvic organs is usually constraint to a lower tolerance dose to avoid undesired adverse side effects. This study evaluates the use of SmartAdapt to analyse the impact of inter-fraction organ deformation on the delivered treatment (74Gy given over 37 fractions).

Materials and Methods: 37 cone-beam computed tomography (CBCT) images from a patient who had underwent prostate image-guided radiotherapy (IGRT) were exported to SmartAdapt (Varian Medical Systems, EclipseTM, version 11). Deformable image registration (DIR) was performed using the planning CT (pCT) as the reference image source for image-guided radiotherapy (IGRT) were exported to CBCT) images from a patient who had underwent prostate case. Automatic segmentation tools was utilis ed to propagate the updated anatomy of the rectum and bladder based on the CBCT images. Deformation correction tools were employed to correct areas of discrepancy. Deformed images were reviewed and exported back to the Eclipse treatment planning system for dose calculation. A total of 37 individual plans were generated using the deformed CT images. Dose volume histograms (DVHs) from each plan were overlapped to provide a mean dose level.

Results: V50 of rectum in the deformed plans ranged from 32.2%-48.8% versus 34.1% in the pCT. Rectum Dmax in the pCT