**Atlas-based Segmentation Improves Consistency and Decreases Time Required for Contouring Postoperative Endometrial Cancer Nodal Target Volumes**

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**Introduction**

- Accurate target delineation of nodal volumes is essential for 3D-conformal and IMRT planning for adjuvant radiation therapy for endometrial cancer.
- We have previously shown that the treatment of pelvic fields based upon bony landmarks inadequately covers the target lymph nodes for endometrial cancer; similar data has also been reported for cervical cancer¹,²
- Atlas-based segmentation has been shown to save contouring time and improve consistency in treatment planning for prostate and head and neck cancers³–⁵
- We hypothesized that atlas-based segmentation (“autocontouring”) would lead to a time savings and more consistent contours among physicians.

**Methods**

- All contouring done using commercially available software (MIM 4.1, MIMvista, Cleveland, OH)
- Pelvic nodal Clinical Target Volume (CTV) contoured as per RTOG 0418
  - Vessels, perinodal tissue & clips included
  - Bone, bowel and psoas & piriformis muscles excluded
  - Superior border: 7 mm below L4/L5 interspace
  - Inferior border: level of the femoral head
- Creation of reference anatomy atlas
  - Patients with endometrial cancer s/p TAH/BSO with representative anatomy retrospectively identified
  - Nodal CTV contoured by 1 radiation oncologist (AVY) on simulation CT scan for 15 patients
- Study patients
  - Using the atlas, nodal CTV autocontours were generated in MIM for 10 patients
  - Under timed conditions, while blinded to other contours, 3 radiation oncologists:
    - Outlined manual CTV contours
    - Corrected the autocontours
- Statistics
  - Time difference determined
  - Overlap of contours calculated with Dice’s coefficient

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**Results**

- Autocontouring led to a time savings of 26% for all radiation oncologists.
- Mean Dice coefficient for manual vs. corrected autocontours for each radiation oncologist:
  - Radiation Oncologist 1: 0.78
  - Radiation Oncologist 2: 0.86
  - Radiation Oncologist 3: 0.78
- The Dice coefficient for all radiation oncologists’ contours: 0.77 (manual) to 0.78 (autocontours), p=0.038

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**Conclusions**

- Autocontouring leads to a time savings and increased consistency when contouring nodal target volumes for the adjuvant treatment of endometrial cancer
- Autocontours still require careful editing to ensure that lymph nodes at risk for recurrence are properly included in the target volume
- Autocontouring may also be beneficial in treatment planning for other pelvic sites

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**Bibliography**