

Case Study Examination of the Impact of Hounsfield Unit Override



in the Eclipse Treatment Planning System



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INTRODUCTION

- ❖ Tissue heterogeneities can impact radiation dose accuracy through inhomogeneity corrections with structures such as air, tissue, and bone
- ❖ Modern treatment planning systems account for heterogeneities through the assessment of Hounsfield Units (HU)
- ❖ This work examines HU overrides across two different treatment sites to provide insight into dose variation and planning system sensitivity

METHODS

- ❖ Eclipse Treatment Planning System V16.1 was utilized in the following left reconstructed breast case study
- ❖ Variations of -1000HU and 0HU were examined in locations nearby the treatment area
- ❖ Lastly, changes in dose distribution were assessed for clinical relevance in PTV and OAR

RESULTS

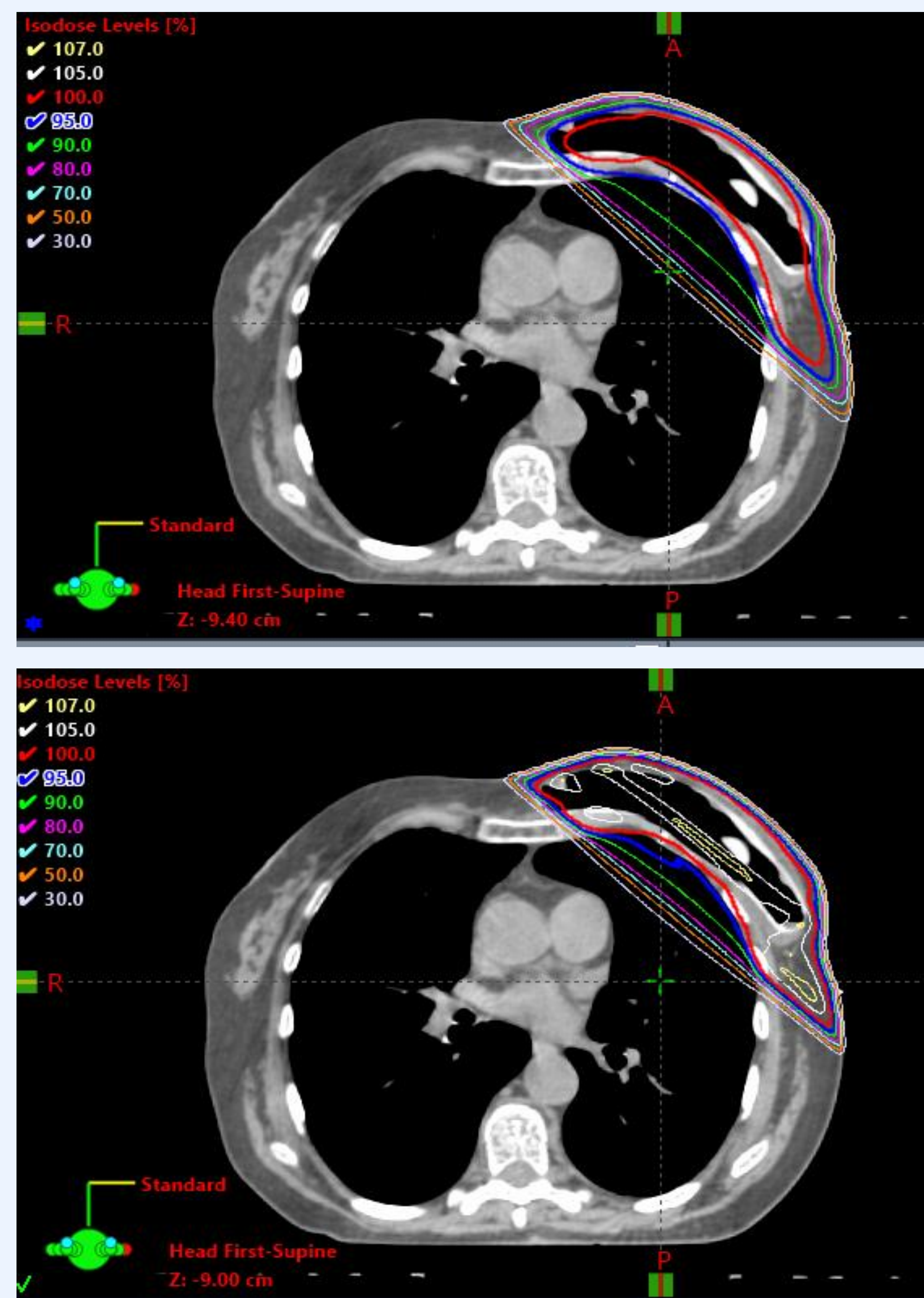


Figure 1: Axial comparison of left reconstructed breast case study with a prescription of 200cGy for 25 fractions. A HU override of 0HU was introduced in the cavity (top). Cavity HU had an average of -1000HU (bottom).

Dosimetric Comparison for PTV

Parameter	Cavity 0HU	Cavity -1000HU
D95%	92.58%	92.05%
D100%	59.50%	71.50%
V105%	7.6cc	140.9cc
V107%	0cc	22.8cc
Dmax	106.90%	109.50%

Table 1: Summary of dosimetric comparison for PTV for the same plan parameters for varying cavity HU. Data extracted from Figure 1. Note the variation in PTV coverage and maximum dose.

Dosimetric Comparison for Left Lung OAR

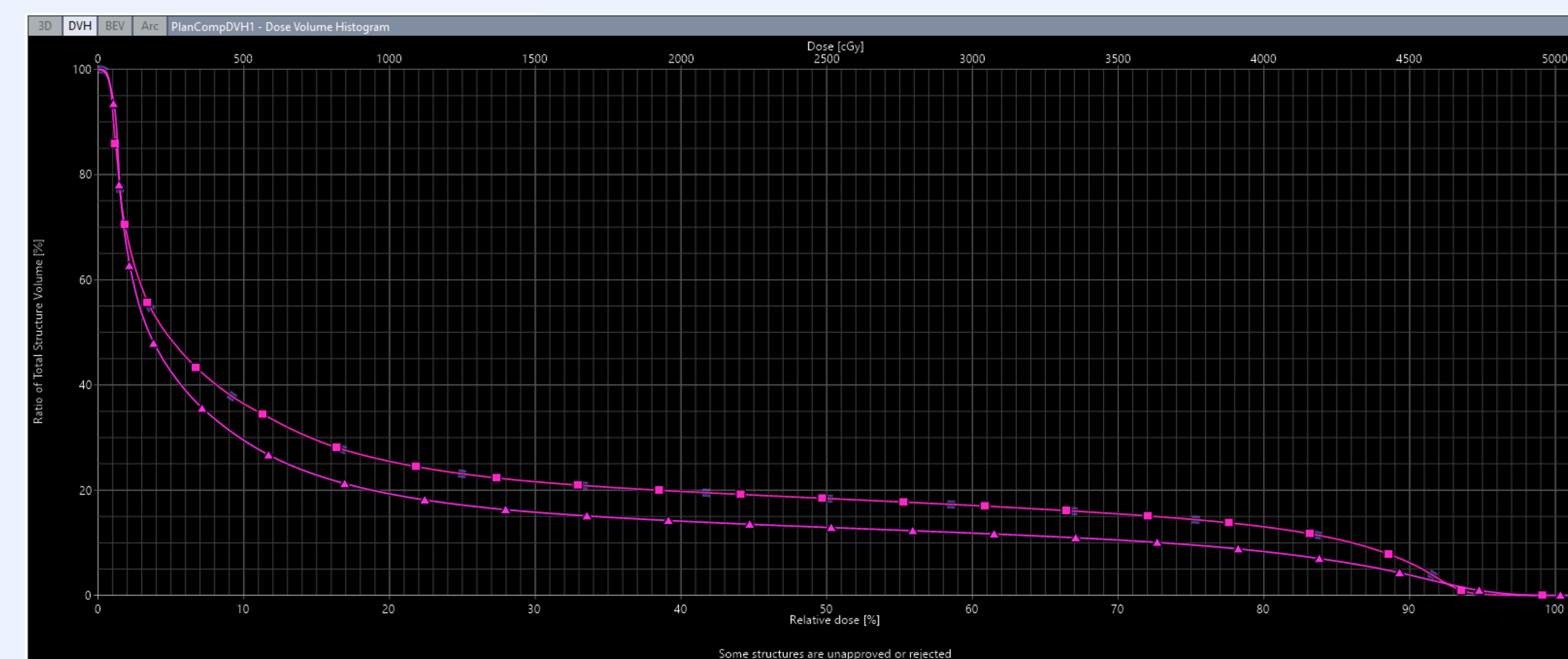


Figure 2: DVH comparison of left lung dose for cavity override of 0HU (triangle) compared to the air cavity with an inherent average of -1000HU (square).

DISCUSSION and CONCLUSIONS

- ❖ Reviewing the impact of varying HU override supports dose differences in key structures nearby the treatment area as demonstrated by the case study

Contact

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