

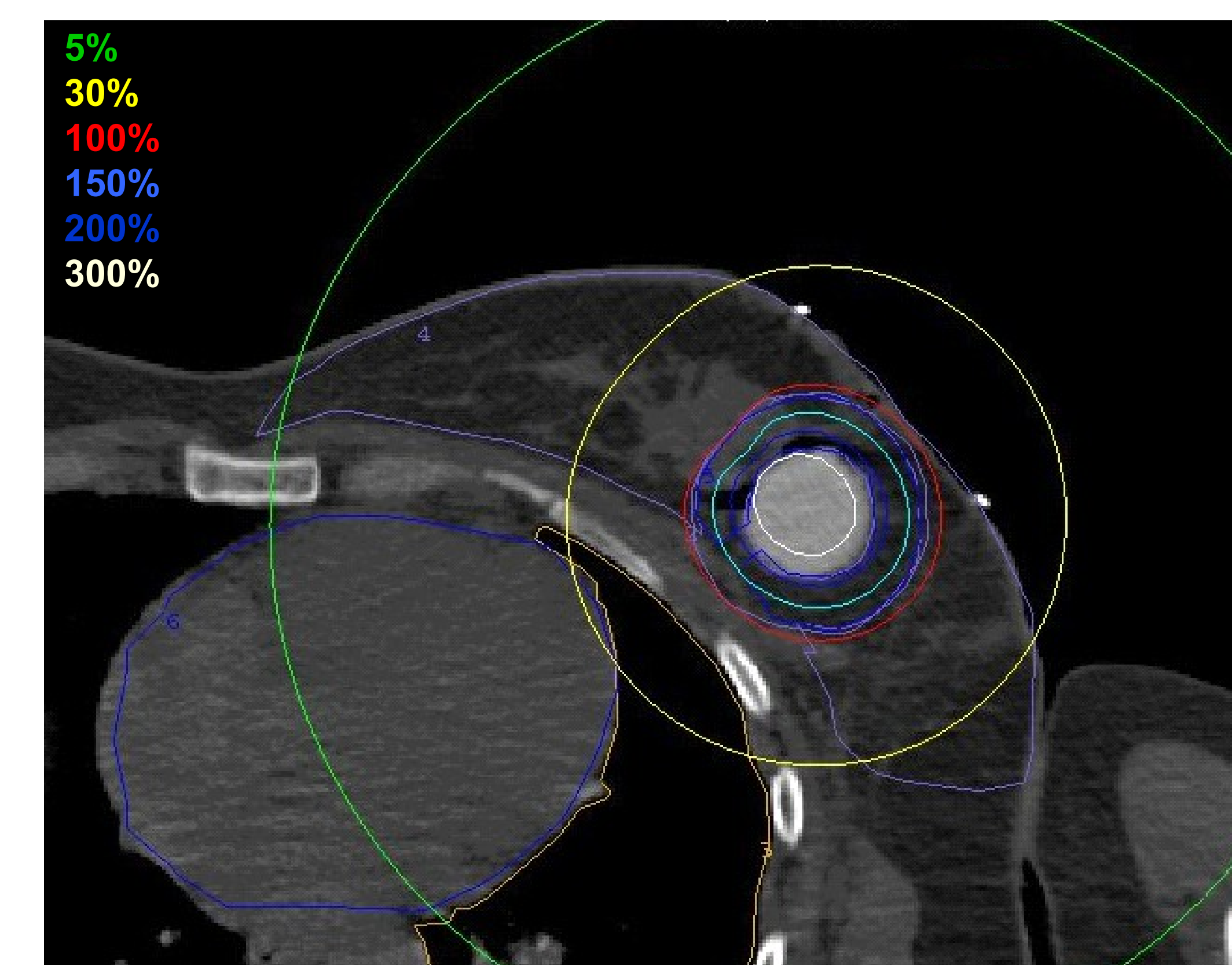
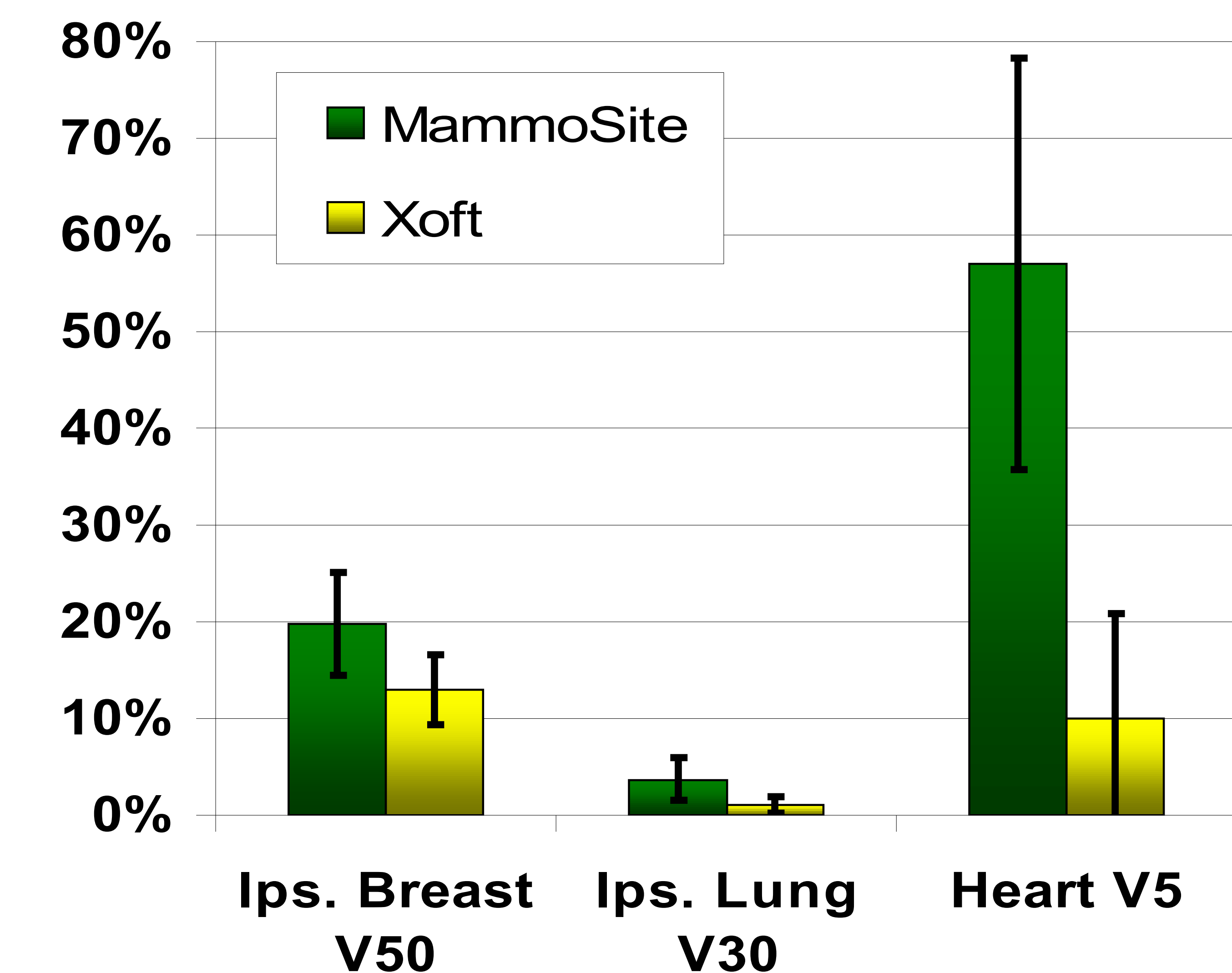
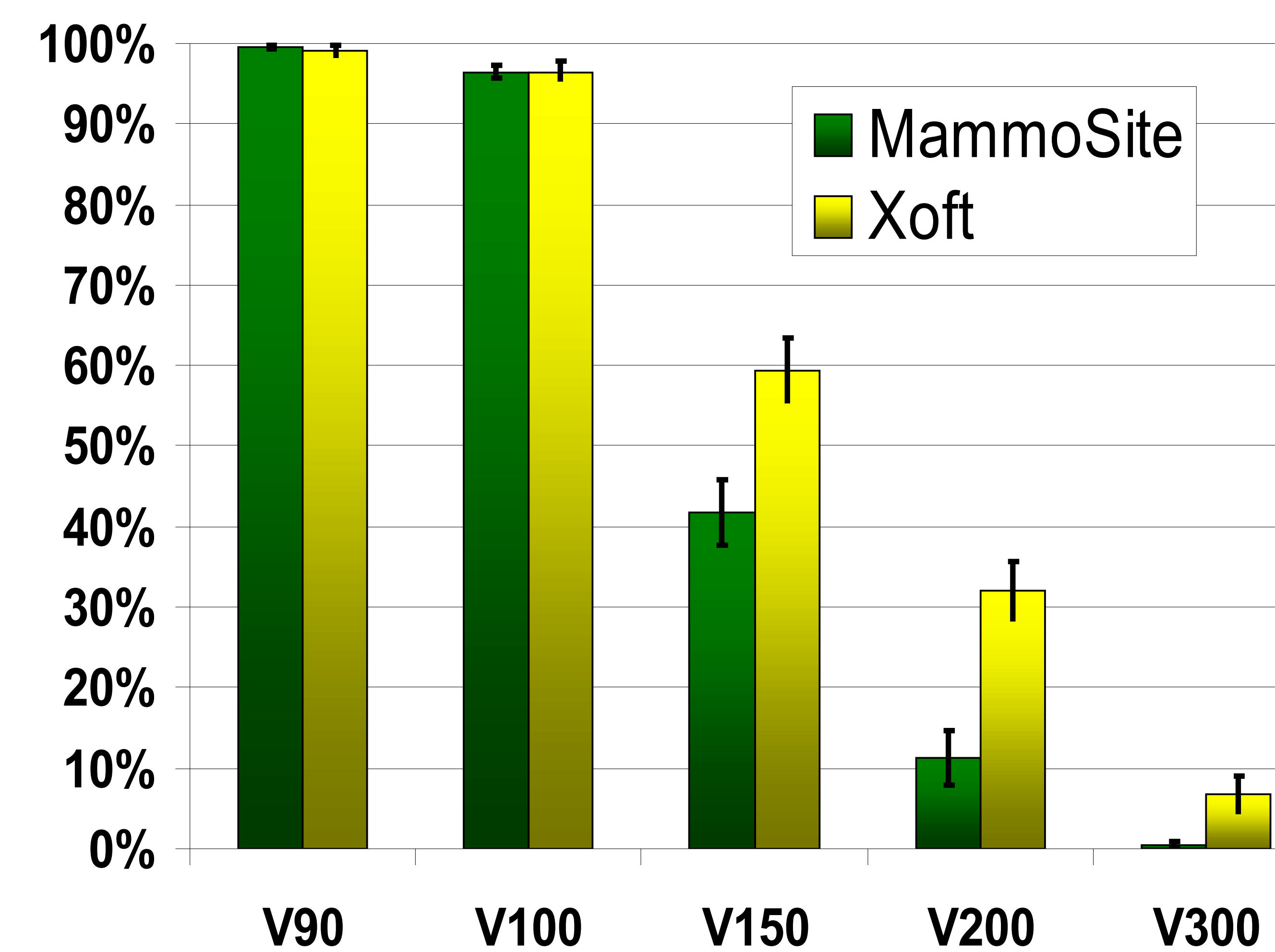
Introduction

Over 14,000 patients have been treated with partial breast irradiation (PBI) using the MammoSite™ balloon brachytherapy applicator and an Ir-192 HDR source. Recently, a new form of balloon-based PBI has been introduced; Xoft Axxent™ electronic brachytherapy system, which utilizes a 50 kV x-ray source. We present our results of a retrospective dosimetric comparison of MammoSite™ and Xoft™ PBI.

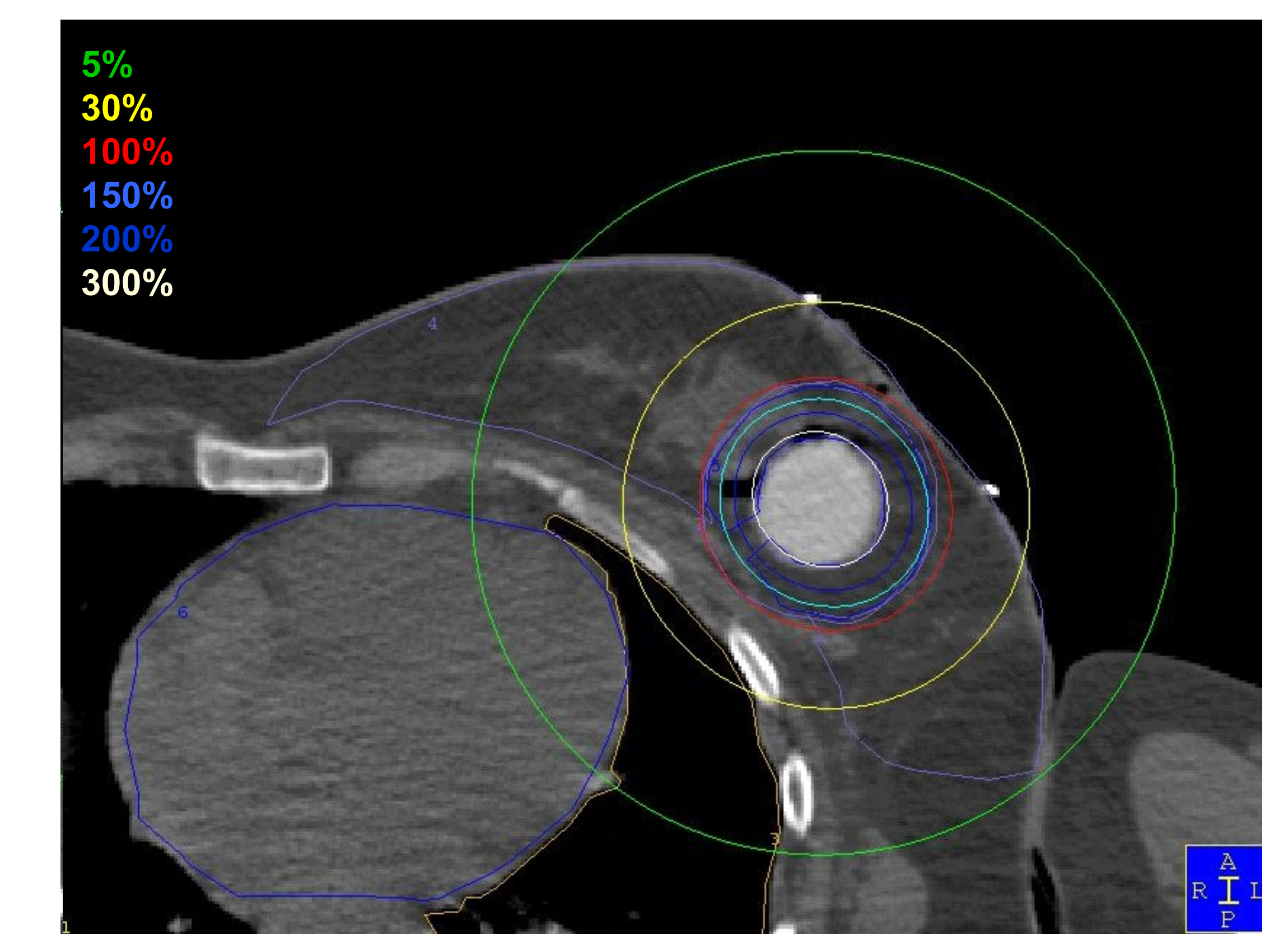
Material and Methods

The study population consisted of 15 patients previously treated with the MammoSite™ balloon brachytherapy device. The planning CT scans from these 15 patients were used to construct a treatment plan using the Xoft™ source characteristics. 3400 cGy in 10 fractions given twice daily was prescribed to 1 cm from the balloon surface using the Rush six-point method¹. The mean V90, V100, V150, V200, and V300 (percentage of PTV receiving 90%, 100%, 150%, 200%, and 300% respectively, of prescription dose), ipsilateral breast V50 (percentage of normal breast receiving 50% of the prescription dose), ipsilateral lung V30 (percentage of lung receiving 30% of the prescription dose), and the heart V5 (percentage of heart receiving 5% of prescription dose) were then determined for each patient using the two methods of balloon-based PBI.

Results



A) Mammosite Ir-192 isodose curves



B) Xoft 50 Kv isodose curves

Conclusion

The MammoSite™ and Xoft Axxent™ methods of PBI offer comparable target volume coverage; however, the Xoft™ method is associated with an increased volume of breast tissue in the high dose regions. The Xoft™ method allows increased normal tissue sparing. The clinical implications of these differences are unknown. It raises the question of whether the benefit of additional sparing to the lung and heart outweighs the potential risk of high dose heterogeneity.