

TomoTherapy[®] Planned Adaptive[™] Case

This clinical case study demonstrates the TomoTherapy[®] Hi·Art[®] treatment system's Planned Adaptive[™] feature, which the clinician can use to evaluate how changes in anatomy and patient positioning impact the delivered dose.

The Plan

The initial treatment plan involves irradiating the head and neck region while limiting dose to the brain, spinal cord, and parotid glands.

Using the *Planned Adaptive* software, the clinician can calculate the dose on the daily CT (verification dose) and evaluate how changes in anatomy (in this case, weight loss) impact the delivered dose.

The DVH in Figure 1 shows how the first fraction verification dose (dashed lines) closely matches the planned dose (solid lines).

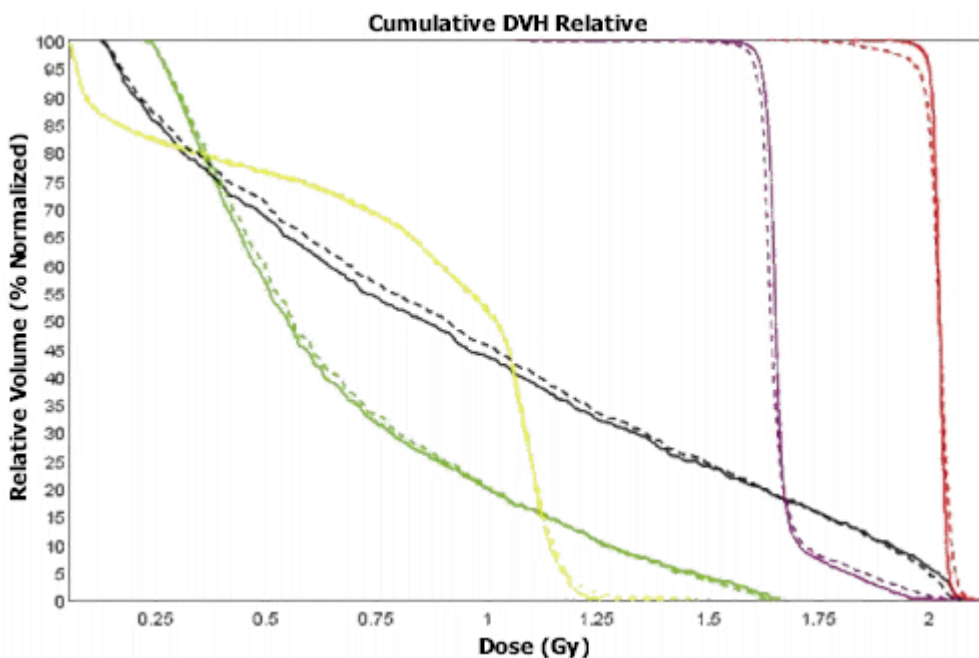


Figure 1: DVH comparing planned dose vs. verification dose for first treatment fraction.

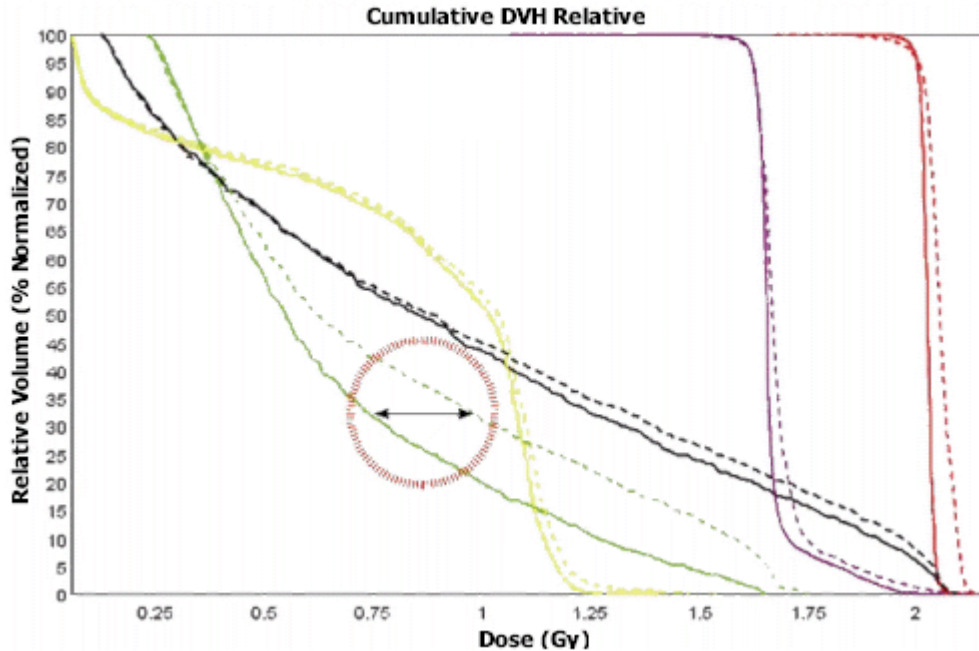


Figure 2: DVH of 15th fraction verification dose indicates increasing dose to right parotid due to patient's weight loss.

The Goals

- Tumor: 70 Gy
- Minimal dose to brain, spinal cord, and parotid glands
- Calculate accumulated verification dose using the daily CT scans
- Adapt plan to accommodate changes in patient anatomy as necessary

After 34 Gy, comparison of verification doses vs. original planned dose show increased dose to right parotid due to anatomical changes (Figure 3). The clinician used the *Hi-Art* treatment system's *Planned Adaptive* software to isolate the hot areas and convert them to ROIs (Figure 4), which were then used to generate a new plan compensating for the changes. The remaining 26 Gy was delivered using the parotid-sparing adaptive plan (Figure 5).

The Results

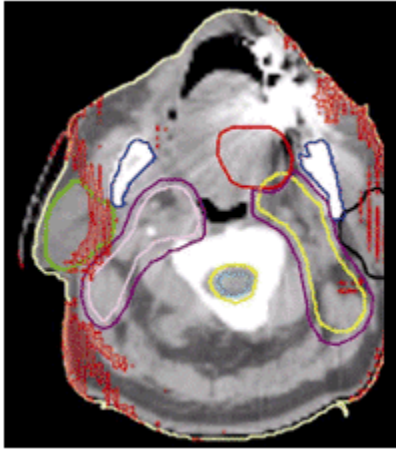


Figure 3: *Planned Adaptive* software highlights “hot spots” where verification dose differs from planned dose.

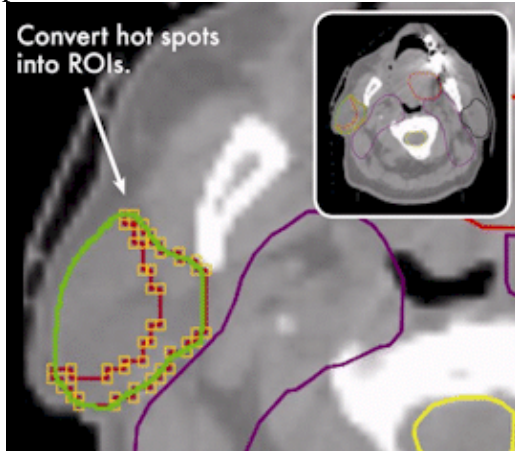


Figure 4: Clinician uses *Planned Adaptive* software to convert hot spots to ROIs, then generates new plan based on new contours.

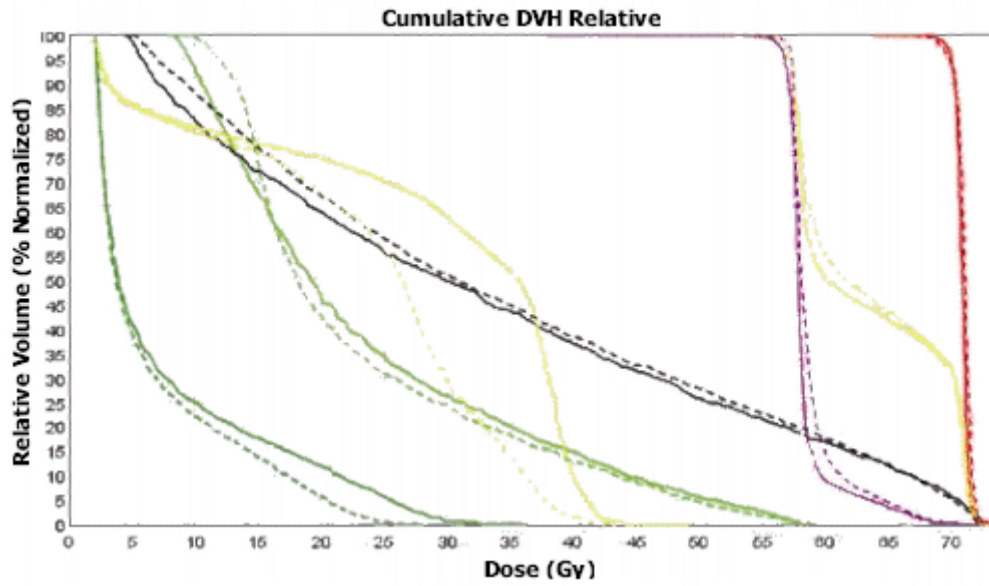


Figure 5: After adapting the plan, the treatment is brought back in line with the original plan goals.

*Treatment plan and case study summary courtesy of M. D. Anderson Cancer Center - Orlando. Used by permission.