

Evaluation of a "MASKLESS" set up for Head and Neck Radiotherapy using DSPS-Prominent® combined with Surface-Guided Monitoring

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INTRODUCTION

- ♦ **Context:** Standard head and neck (H&N) radiotherapy relies on a 5 point thermoplastic mask for precise immobilization.
- ♦ **Challenge:** Some patients are unable to tolerate this type of immobilization (claustrophobia, tracheostomy, respiratory disorders)
- ♦ **Objective:** To assess the accuracy and reproducibility of an alternative method without a facial mask: the DSPS-Prominent® positioning system combined with surface-guided radiation therapy (SGRT).

Key question:

Can we ensure optimal coverage of the planned target volume (PTV) using the same margins as standard immobilization?

METHODS

- ♦ **Patient Cohort:** 4 patients unable to tolerate standard immobilization.
- ♦ **Facilities:** Varian TrueBeam 4.1 linear accelerator + Real-time surface monitoring using AlignRT (Vision RT).
- ♦ **Technical parameters**
 - **Repositioning Tolerances:** 1,5 mm (translations) / 1,5°(rotations).
 - **Imaging:** CBCT before and after treatment session to assess intra fraction movement.
- ♦ **Analysis:** Comparaison of intrafraction motion with PTV margins (4mm in all directions).

RESULTS

- ♦ **Mean positional deviations:**
 - 0.86 mm (lateral) ($\sigma=0.52$) – 0.81 mm (longitudinal) ($\sigma=0.78$) – 1.46 mm (vertical) ($\sigma=1.08$)
 - Mean Rotational shifts < 1°
- All positional deviations remained within the 4 mm PTV margins.

After medical assessment, on CBCT post treatment 100% of targets volumes remained covered by the prescription isodose. Coverage was confirmed across all sessions.

CONCLUSION

The DSPS-Prominent® system combined with Vision RT enables precise and reproducible immobilization for head and neck radiotherapy.

Next step: A clinical trial to extend inclusion to all H&N patients and assess patients comfort improvement.

Ultimate goal: Consider the maskless strategy as a new standard of care.



Figure1: Picture of DSPS-Prominent® combined with Vision RT



Figure2: (top) Patient positioning using the video postural system and real-time tracking with the specific ENT ROI (bottom)

	Patient 1	Patient 2	Patient 3	Patient 4
meanVrt(mm)	1.05	1.31	1.86	0.45
meanLng(mm)	0.85	0.98	0.59	0.12
meanLat(mm)	1.00	0.88	0.74	0.125
meanYaw°	0.50	0.39	0.28	0.65
meanPitch°	0.75	0.28	0.55	0.45
meanRoll°	0.55	0.49	0.37	0.65



Scan this QR code to view a video of our workflow

SUMMARY

The DSPS-Prominent® System (MacroMedics), used with VisionRT Surface-guided Radiotherapy ("maskless"), ensures accurate and reproducible immobilization in H&N treatments, offering a mask-free alternative for patients unable to be treated with standard immobilization.