Comparison between the SGRT and the conventional setup method for patients undergoing VMAT for gynecological malignancies

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Background:

Surface Guided Radiation Therapy (SGRT) is a novel method for positioning patients on the linear accelerator's couch, utilizing 3D stereo cameras to monitor the skin's surface.
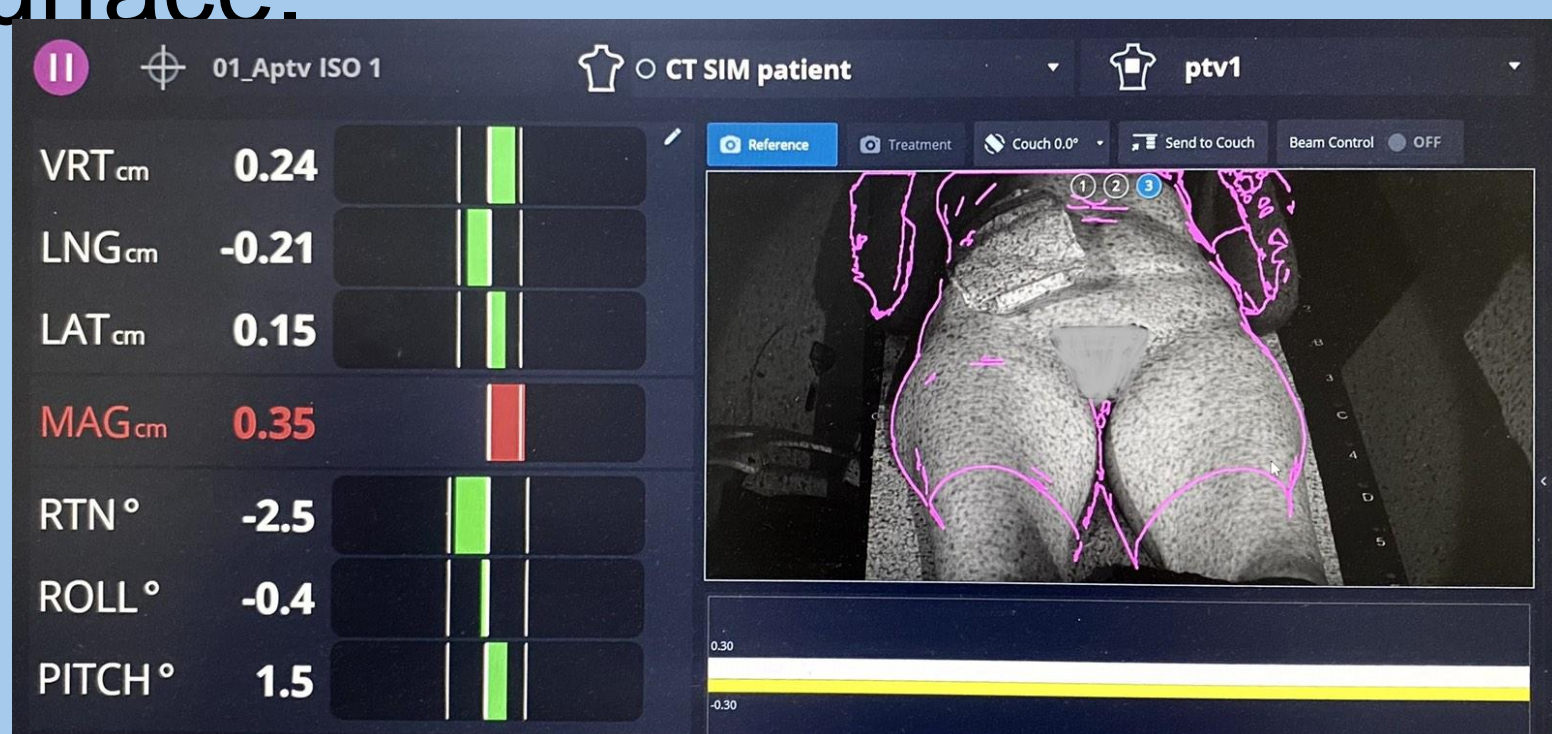
The aim of this study is to compare:
(a) the positioning accuracy,
(b) the positioning time,
between SGRT and conventional method based on tattoos-lasers for patients undergoing VMAT for gynecological malignancies.

Materials & Methods:

Ten female patients who underwent dual-arc VMAT (Infinity, Elekta) treatment for gynecological cancer were divided into two equal groups:

Materials & Methods:

| Group A	Group B
• 111 sessions. • Conventional method for patient positioning.	• 82 sessions. • SGRT method for patient positioning using the AlignRT system (VisionRT Ltd, London, UK).
Pre treatment planning CT (RTCT)	RTCT & creation of patient's contour.
Patient positioning using tattoos and lasers.	Patient positioning using 3D cameras & patient's contour.
CBCT for position verification.	CBCT for position verification.
Recording of CBCT's system 3D shifts: lateral (lat), vertical (vrt), longitudinal (lng).	Recording of CBCT's system 3D shifts: lat., vrt., lng.
Total shift: $v = \sqrt{lat^2 + lng^2 + vrt^2}$	Total shift: $v = \sqrt{lat^2 + lng^2 + vrt^2}$

Recording of positioning time:
Time from the moment the patient lies on the couch until the begging of CBCT.

Results (a):

	Vrt	Lat	Lng	Total
Median corrections (cm)				
Group A	0.30±0.03	0.30±0.03	0.40±0.04	0.66±0.03
Group B	0.30±0.02	0.20±0.02	0.20±0.03	0.51±0.03
p-value	0.55	<0.05	<0.05	<0.05

Results (b):

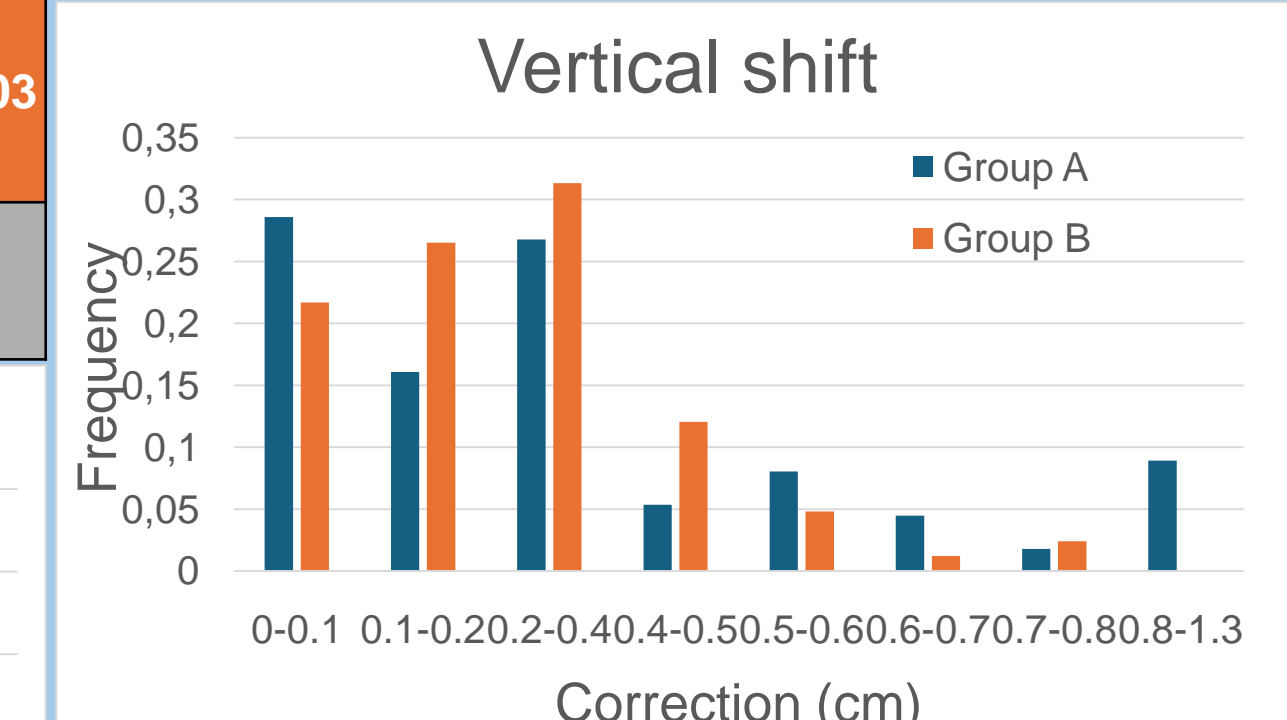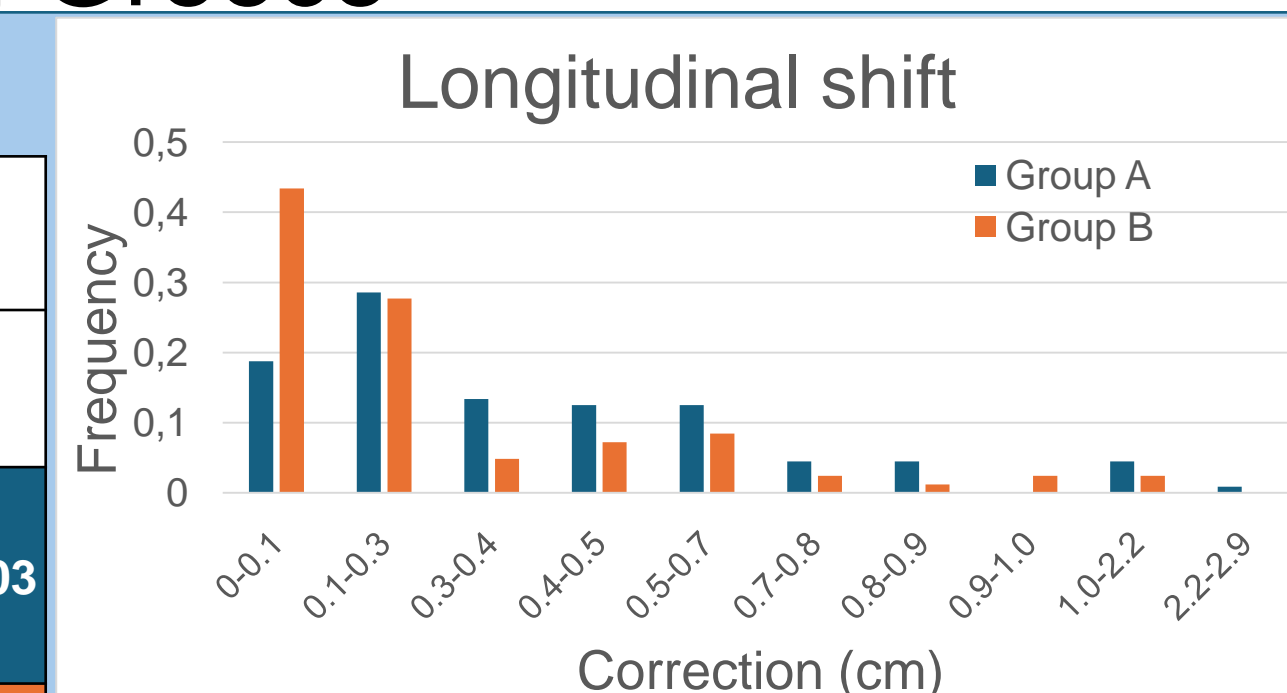| Median Time (min)	
Group A	1.6±0.1
Group B	2.0±0.1
p-value	<0.05
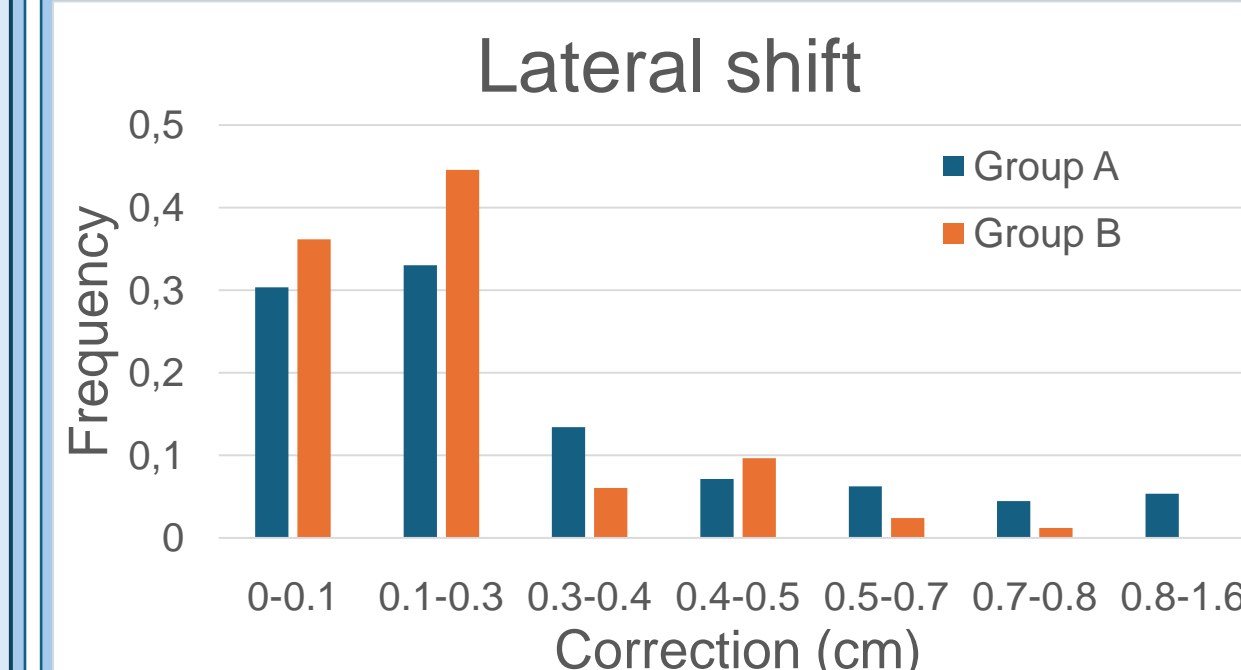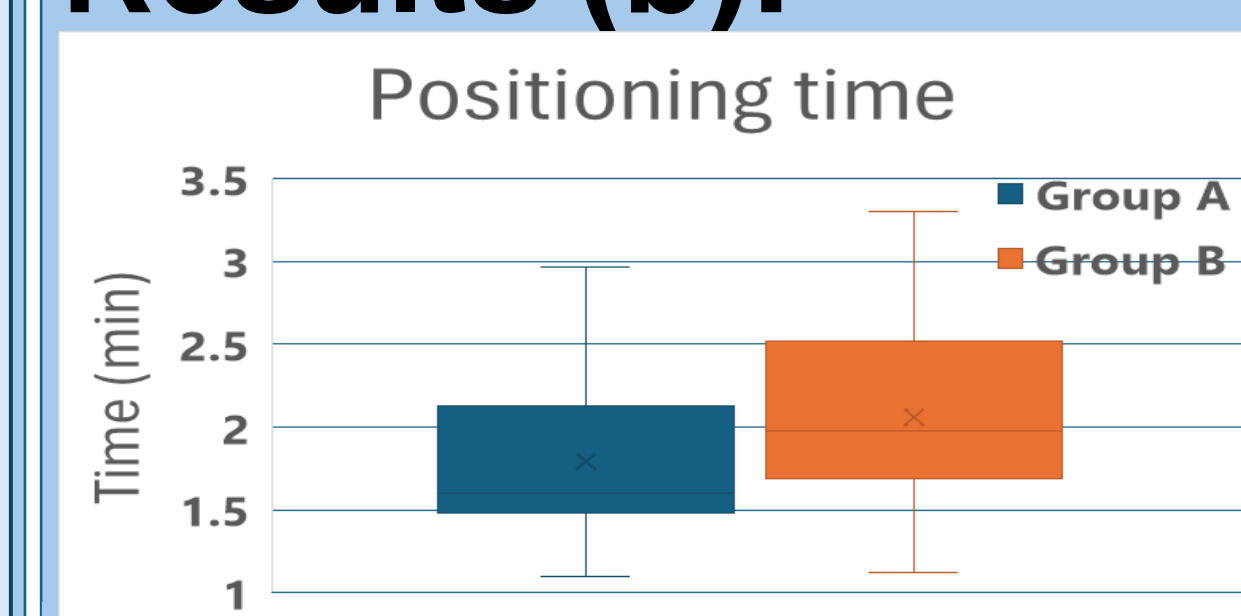
Conclusion:

These preliminary results show that the SGRT can significantly reduce the positioning corrections. However, the SGRT led to slightly increased positioning times in respect to the laser-tattoos method.