Comparison of patients treated with Conventional Head and Neck mask Versus Open mask using SGRT setup

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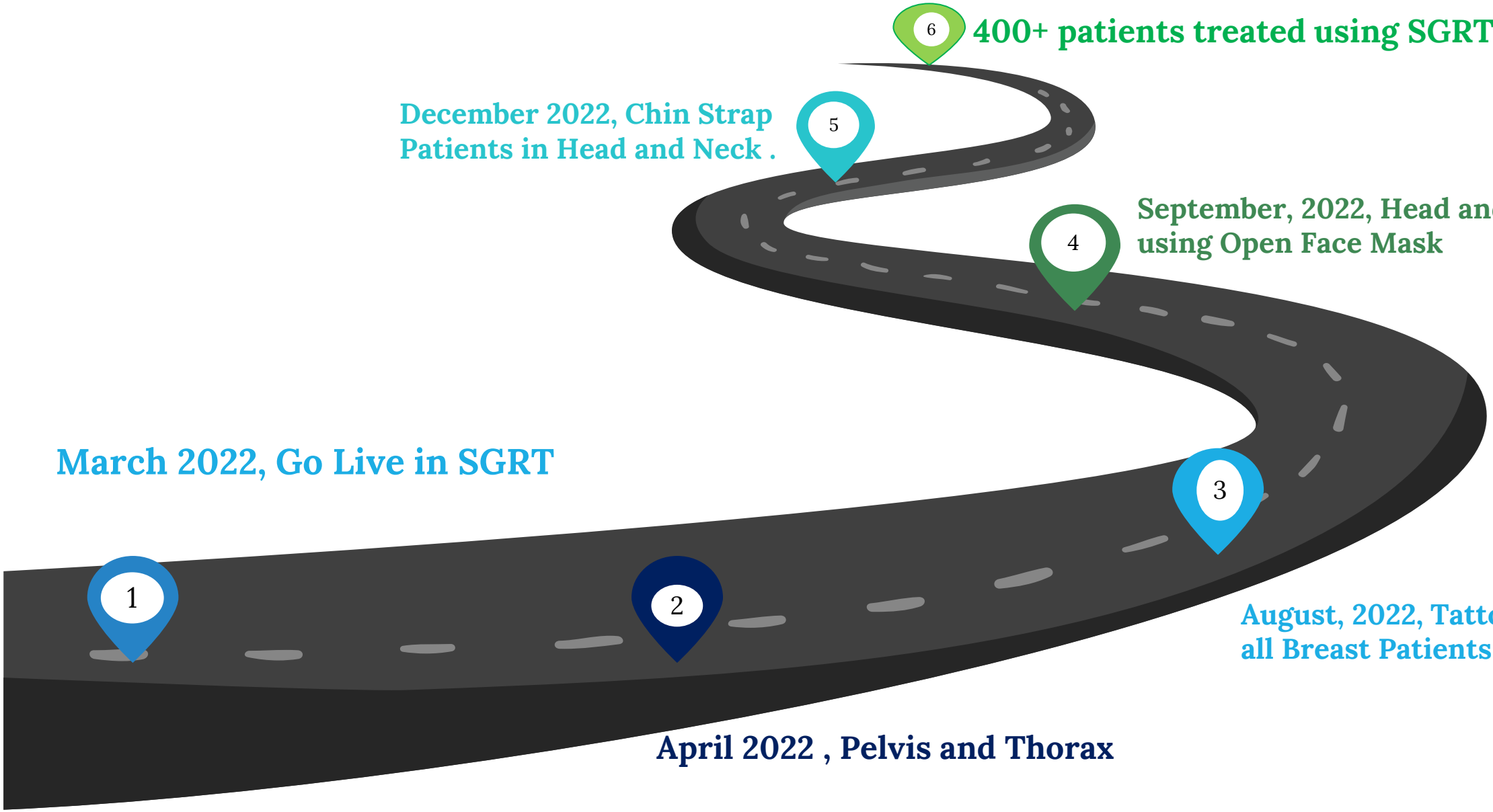
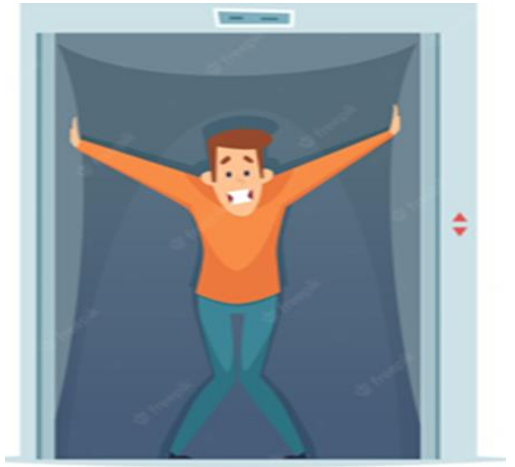
SGRT in KSSSCI



Why we need SGRT in HN?



- Thermoplastic masks many patients find masks constrictive and stressful.
- It is solution for patients suffering from claustrophobia.
- Inaccuracies due to deformation of mask over time.
- The treatment area is close to critical structures such as the spinal cord, salivary glands, and eyes.
- Intra-fraction imaging capabilities are limited for IGRT which gives rise to SGRT.

Study Design:

- Patients undergoing Head and Neck Treatment
- Group 1: Open Mask (OM) Vs Group 2 : Closed Mask (CM)
- 20 patients in each group

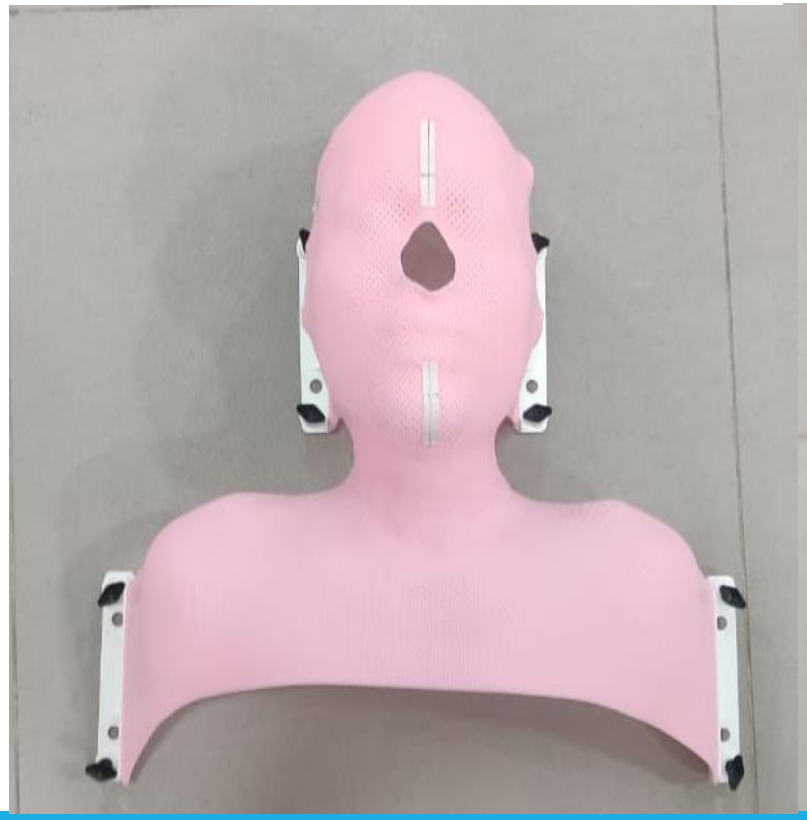
Objective 1: Analyzing SGRT Benefits in HN

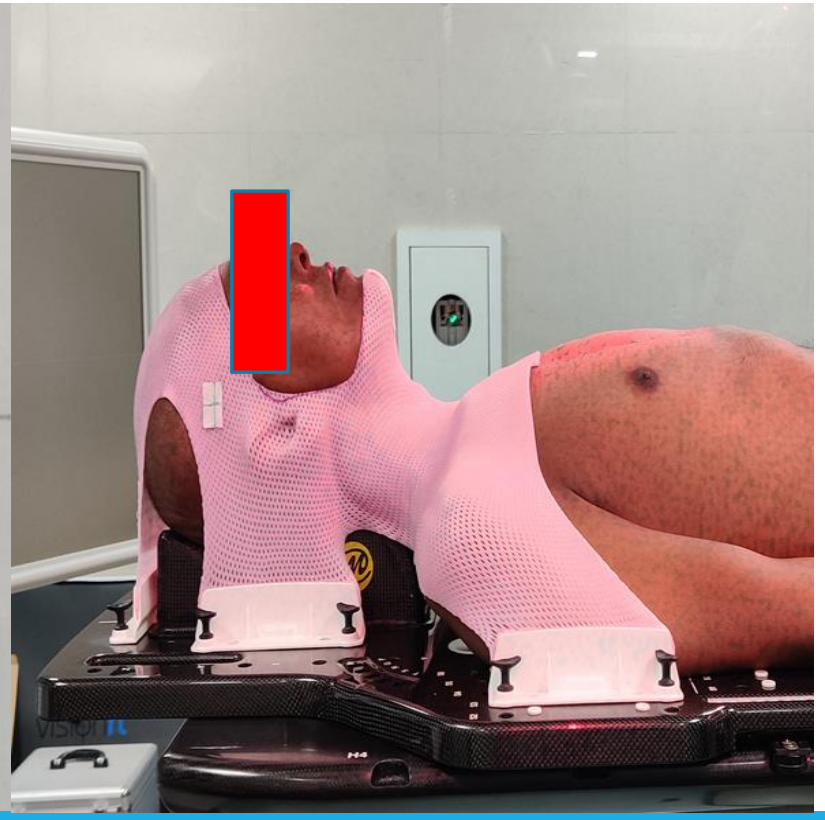
Objective 2: Consistency of Immobilization Device

Objective 3: Practical Implication of Open Face Mask

Materials:

- Group A: Open Mask - Inhouse modified RayFit/ MacroCast by Macromedics 5 Point / 2.3mm with open on the face for SGRT Compatible
- Group B: Ray fit/ MacroCast 5 Point Mask/2.3mm by Macromedics





SGRT workflow:

CT

- Custom modified Face Mask prepared

Planning

- Outer Contour as reference surface
- Export outer contour and plan/isocenter to SGRT system
- Optimize the reference surface

Preparation

- Import and verify contour & isocenter
- Define ROI
- Error thresholds of 2 mm for longitudinal, lateral, and vertical shifts and 1.5 ° for rotation, pitch, and roll .

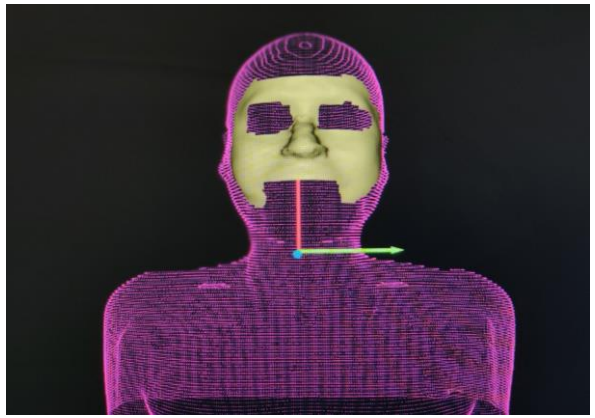
Positioning

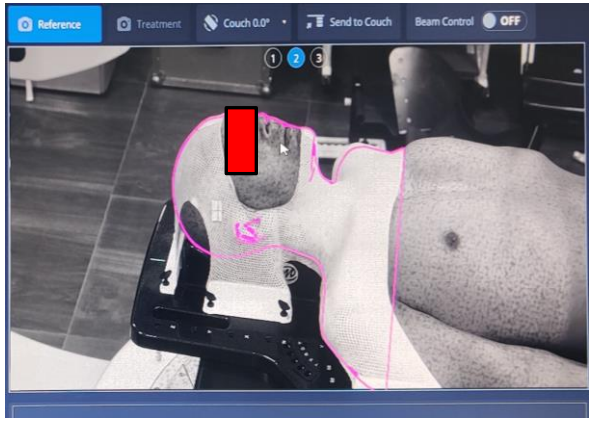
- Position Patient with reference image
- Align the nose and chin followed by lower neck and shoulder will be matched
- Verify pre Treatment Position and applied shifts

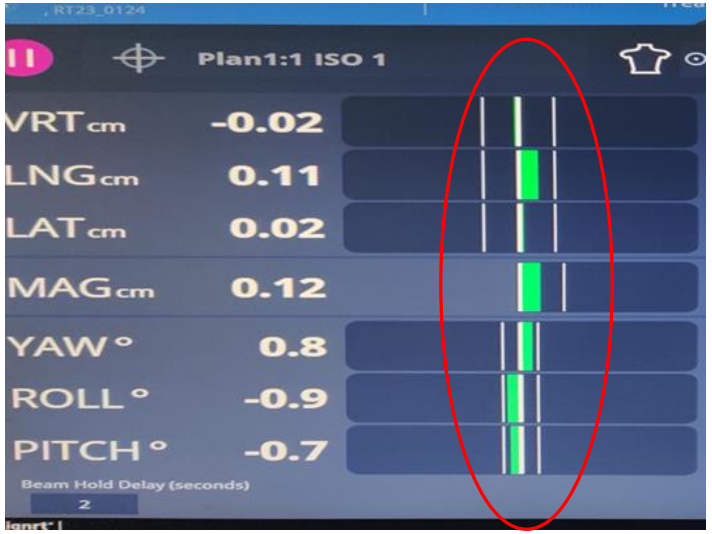
Treatment

- Continue Surface Monitoring Beam Hold If patients moves


SGRT treatment workflow:







Skin Surface data taken from reference CT

One ROI drawn at the face

Initial setup with nose and chin after that lower neck and shoulder will be matched

Error thresholds of 2 mm for longitudinal, lateral, and vertical shifts and 1.5 ° for rotation, pitch, and roll .

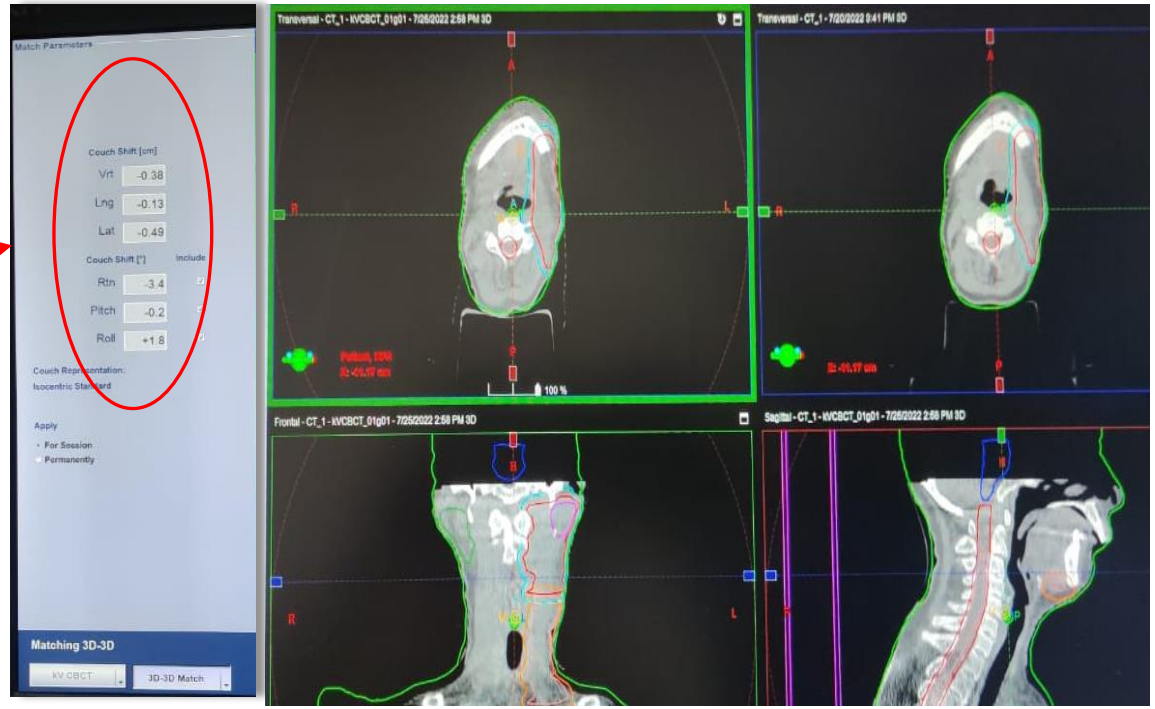
Online CBCT matching first included bony spine and skull anatomy, followed by soft tissue matching around PTV.

Repeat Surface capturing is acquired

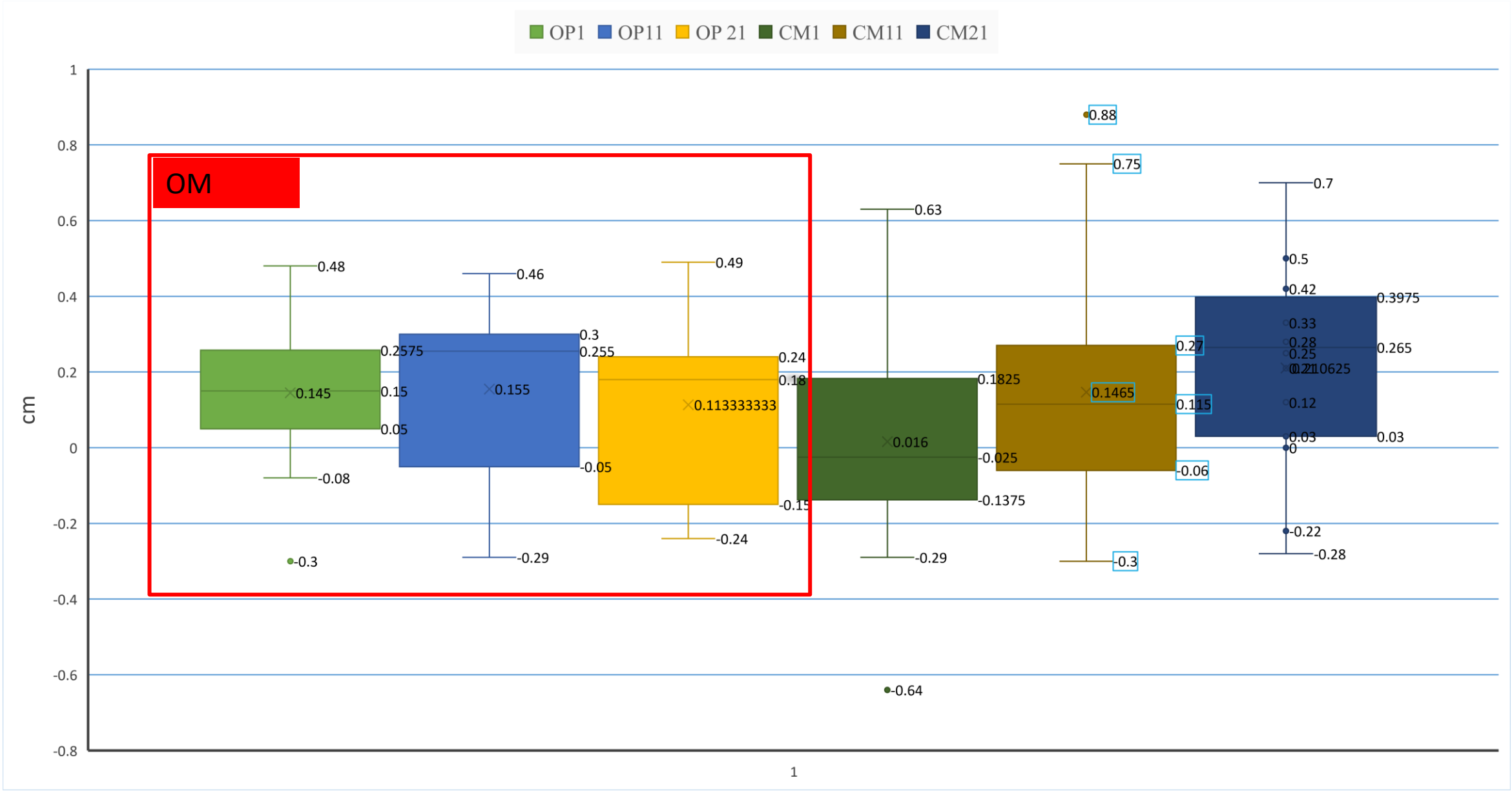
CBCT Matching Workflow:

- Online CBCT matching with bony spine and skull anatomy, followed by soft tissue matching around PTV
- We have take setup error data during 1st , 11th and 21st fraction.
- 120 images analysed for this studied.
- True Beam SVX 6D Couch

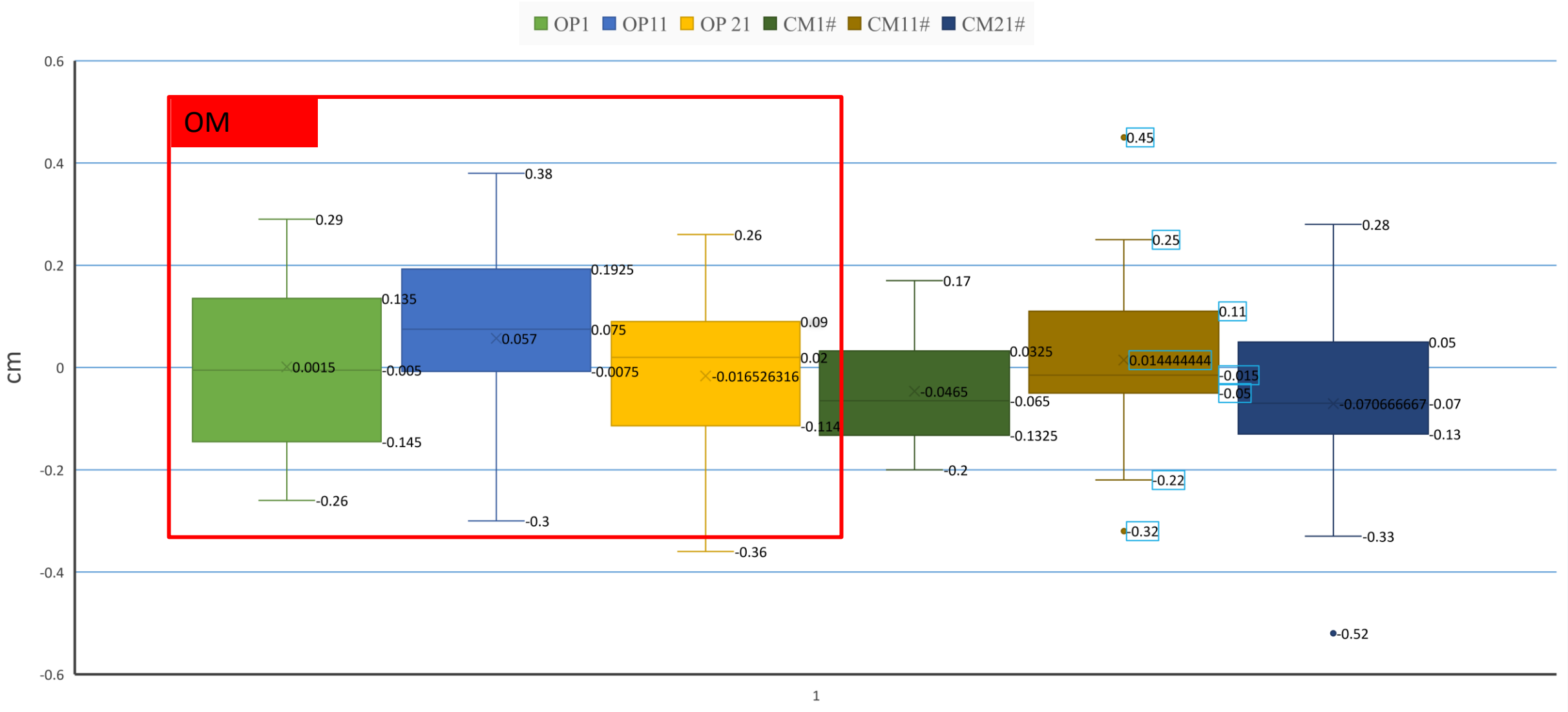
1. Vertical
2. Longitudinal
3. Lateral
4. Yaw
5. Pitch
6. Roll



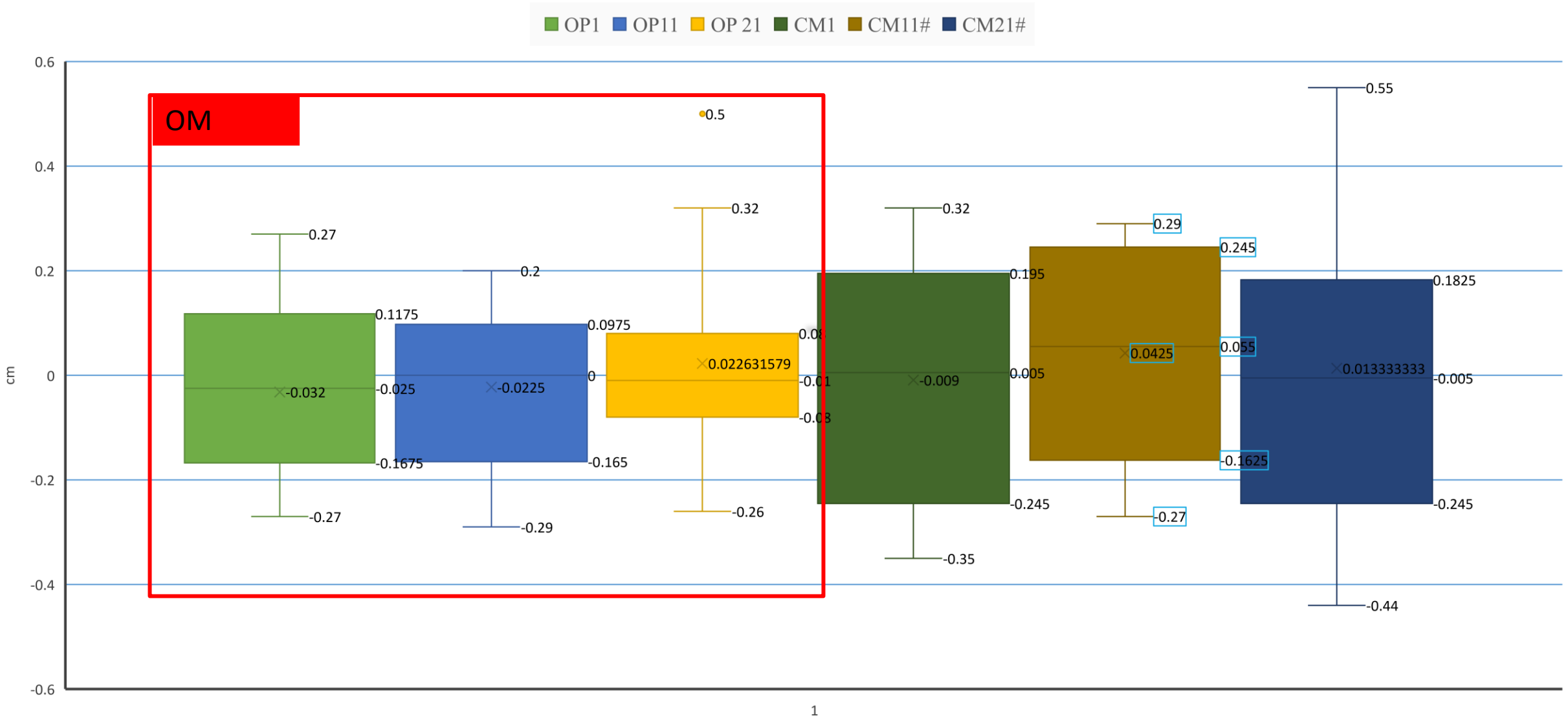
Vertical Setup Error b/w Open Face Mask (OM) and Closed Mask(CM)



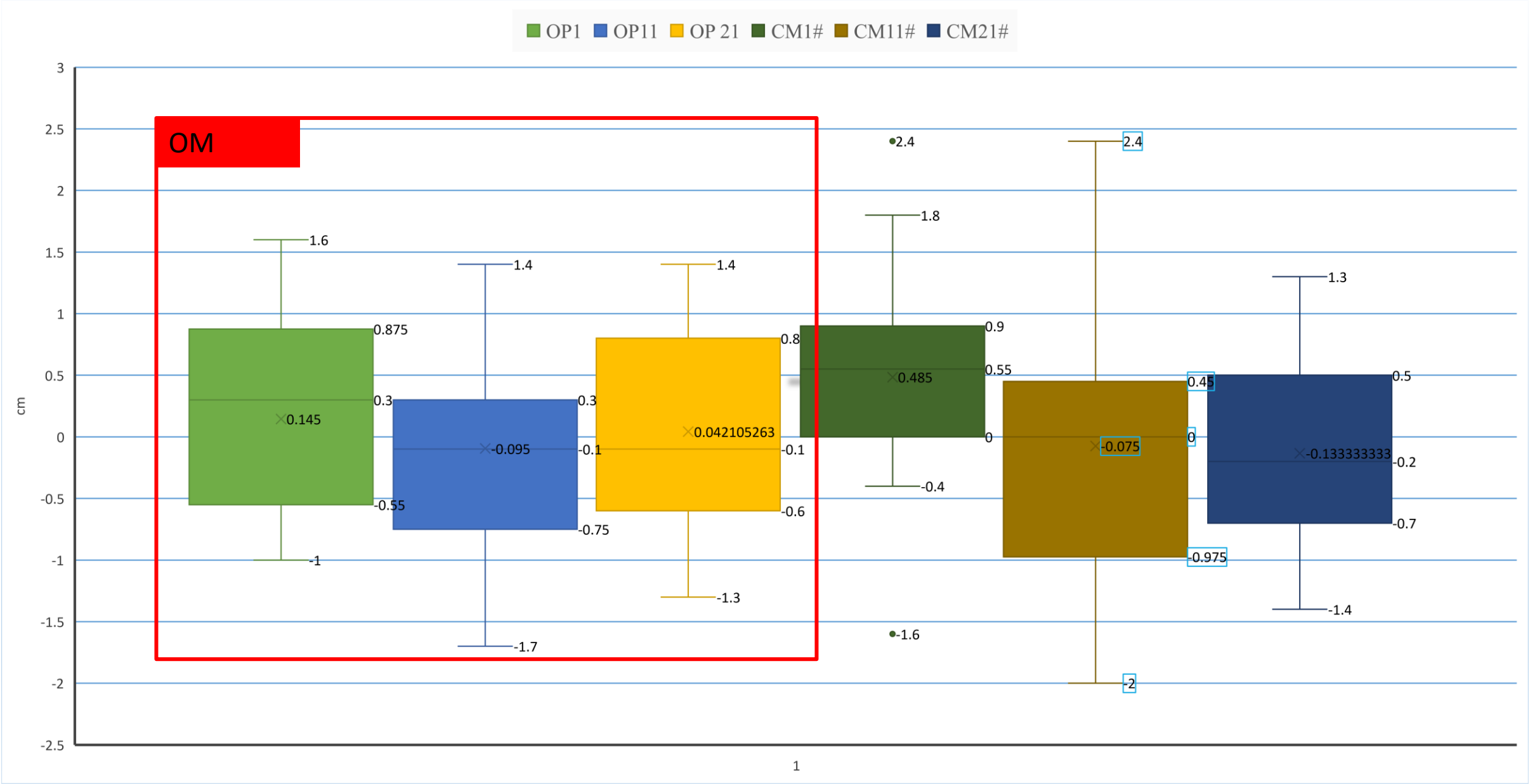
Longitudinal Setup error b/w Open Face Mask (OM) and Closed Face Mask (CM)



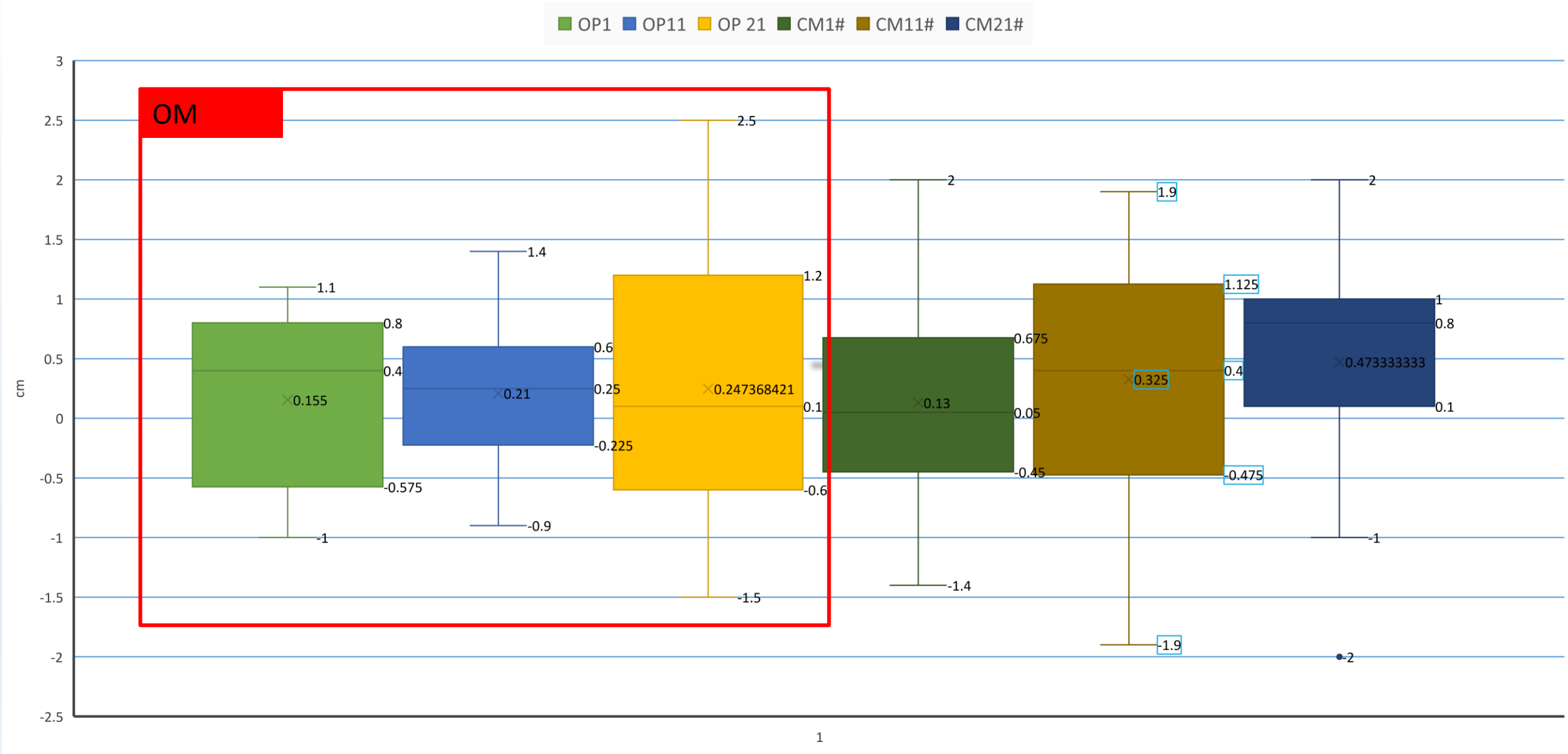
Lateral Setup error b/w Open Face Mask (OM) and Closed Face Mask (CM)



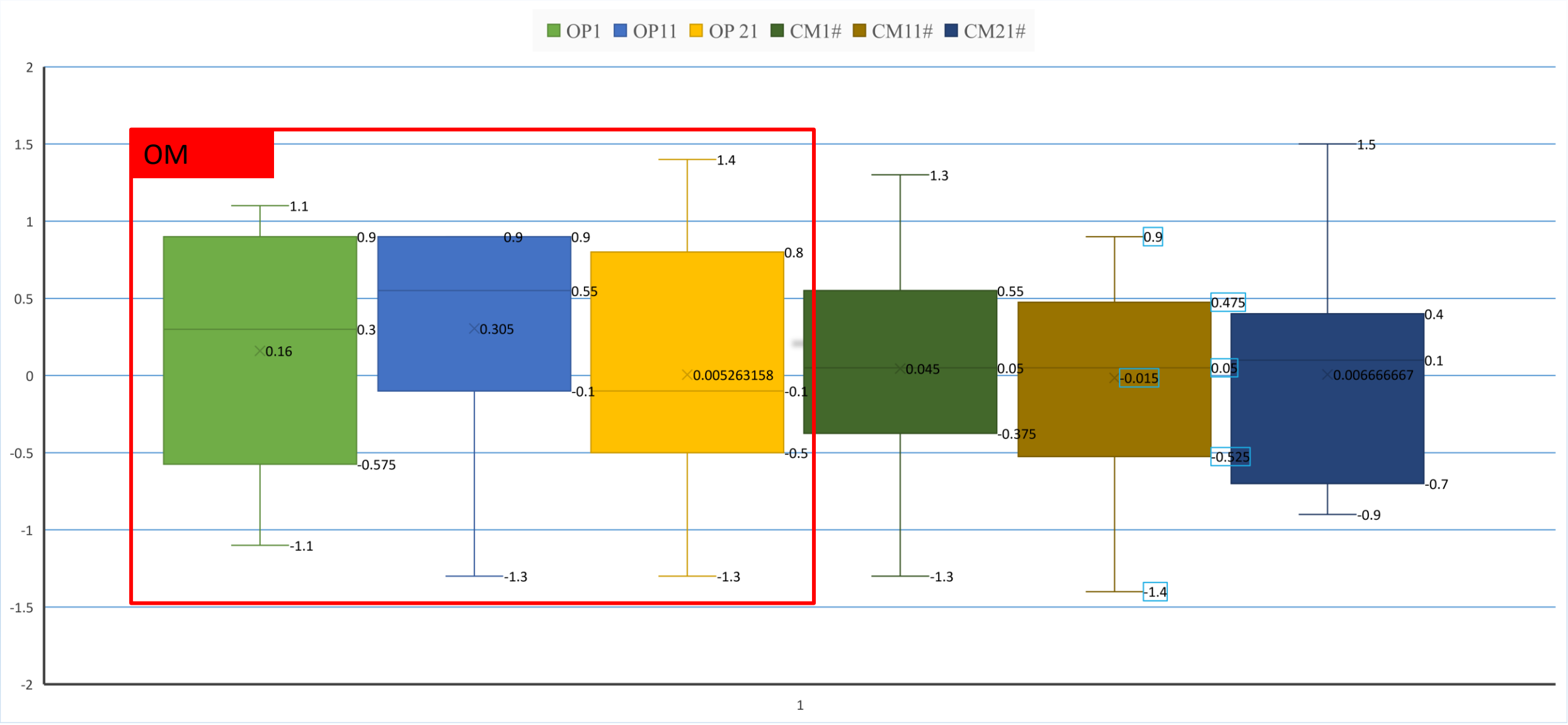
Pitch Setup error b/w Open Face Mask (OM) and Closed Face Mask (CM)



Roll Setup error b/w Open Face Mask (OM) and Closed Face Mask (CM)



Yaw Setup error b/w Open Face Mask (OM) and Closed Face Mask (CM)



Results:	Mean and SD			
Axes	Type of Immobilizations	1	11	21
Vertical	OM	0.145±0.169	0.155±0.220	0.048±0.250
	CM	0.016±0.271	0.1465±0.169	O.210±0.257
	T Test	**0.08**	**0.921**	**0.069**
Long	OM	0.001±0.016	-0.042±0.198	-0.0165±0.163
	CM	-0.0465±0.102	-0.066±0.155	-0.070±0.0188
	T Test	**0.287**	**0.665**	**0.385**
Lateral	OM	-0.032±0.167	-0.022±0.158	0.022±0.261
	CM	-0.009±0.212	0.0425±0.202	0.055±0.2611
	T Test	**0.706**	**0.266**	**0.684**
Pitch	OM	0.145±0.790	-0.095±0.8055	0.042±0.182
	CM	0.485±0.873	-0.075±1.056	-0.133±0.794
	T Test	**0.204**	**0.946**	**0.531**
Rolls	OM	0.155±0.722	0.21±0.599	0.247±1.062
	CM	0.13±0.784	0.325±1.002	0.473±1.047
	T Test	**0.917**	**0.662**	**0.539**
Rotation	OM	0.16±0.739	0.305±0.656	0.0052±0.767
	CM	0.045±0.730	-0.015±0.663	0.006±0.694
	T Test	**0.623**	**0.133**	**0.995**

Conclusion

1. Consistency is better in Open Face Mask
2. There is no statistical difference found between the two groups.
3. Open Face Mask should be suitable immobilization for patients suffer Claustrophobia and anxiety
4. No need of virtual simulation procedures
5. Open mask is good replacement for closed mask based on this study

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