

Is intraoperative volumetric assessment of breast volume reliable? Comparing volumetric assessment using a Vectra H2 handheld device in supine, sitting, and standing positions

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Background

Three-dimensional (3D) volumetric assessment is receiving increased recognition in breast surgery. It is commonly used for preoperative planning and postoperative control with the patient standing in upright position. Recently, intraoperative use was evaluated with patients in supine position. The aim of this prospective study was to evaluate volumetric changes in 3D surface imaging depending on patients' position.

Methods

3D volumetric analysis was performed using Canfield Vectra-H2 Handheld device with patients in standing, sitting and supine position. 100 complete datasets of female breasts were included in the study. The measured volumes of each evaluated breast (n=200) were compared between the 3 positions.



Fig. 1: Performing the 3D-volumetry in sitting and standing position

Results

The mean breast volume assessed while standing was 495.44 ± 204.46 cc. In the sitting position, it measured as 488.28 ± 208.14 cc, indicating no statistically significant difference ($p = 0.729$). In the supine position, the mean breast volume measured 375.13 ± 148.03 cc, and thus demonstrated a statistically significant difference from the standing position ($p < 0.001$).

The mean absolute difference of the measured breast volumes per breast between the standing and sitting positions was 7.15 ± 93.67 cc ($p = 0.281$). This suggests that the 3D volumetric assessment of patients in the sitting position is reliable and correlates well with the validated assessment performed on a standing patient.

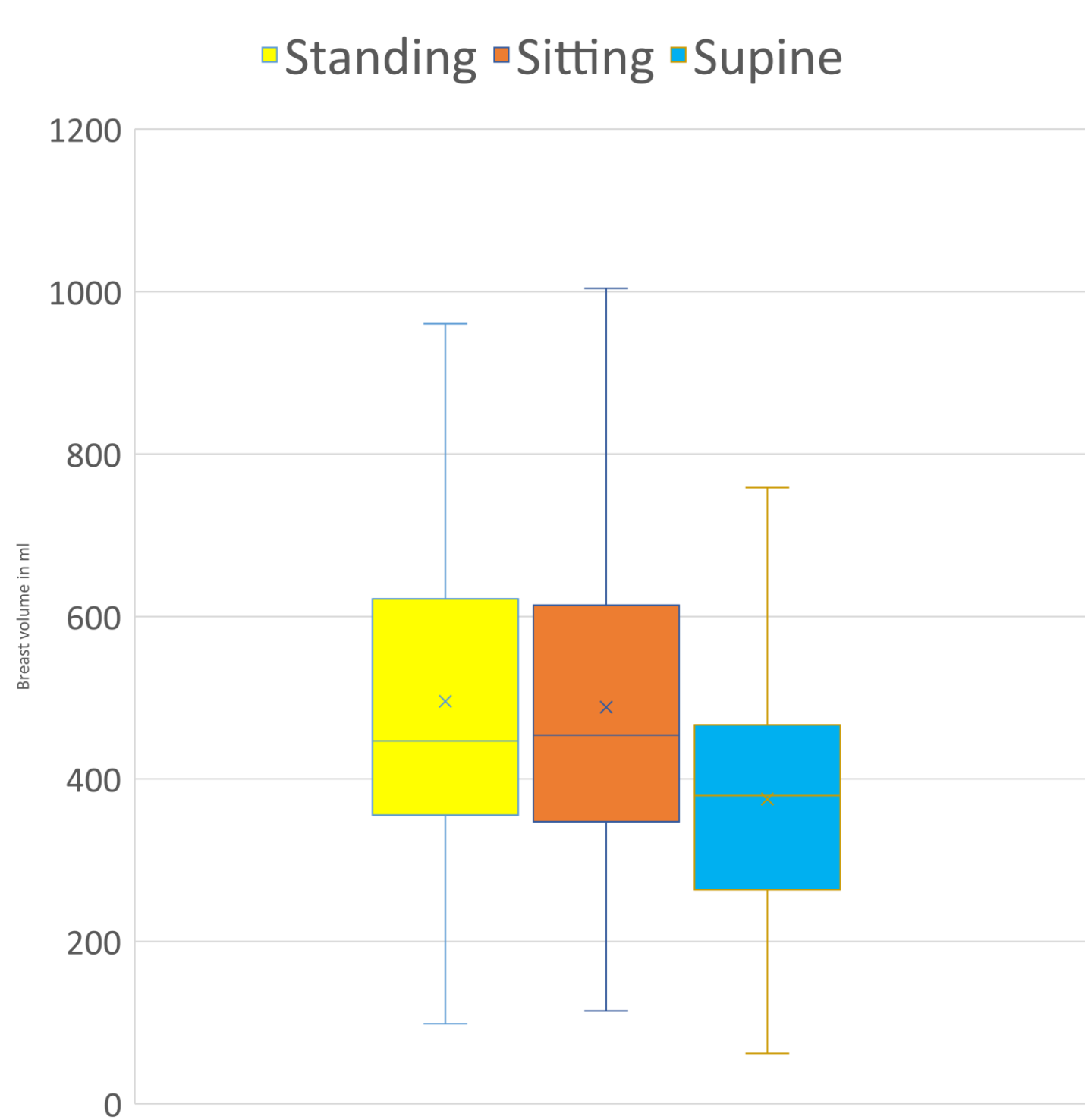


Fig. 2: Measured median breast volumes per position

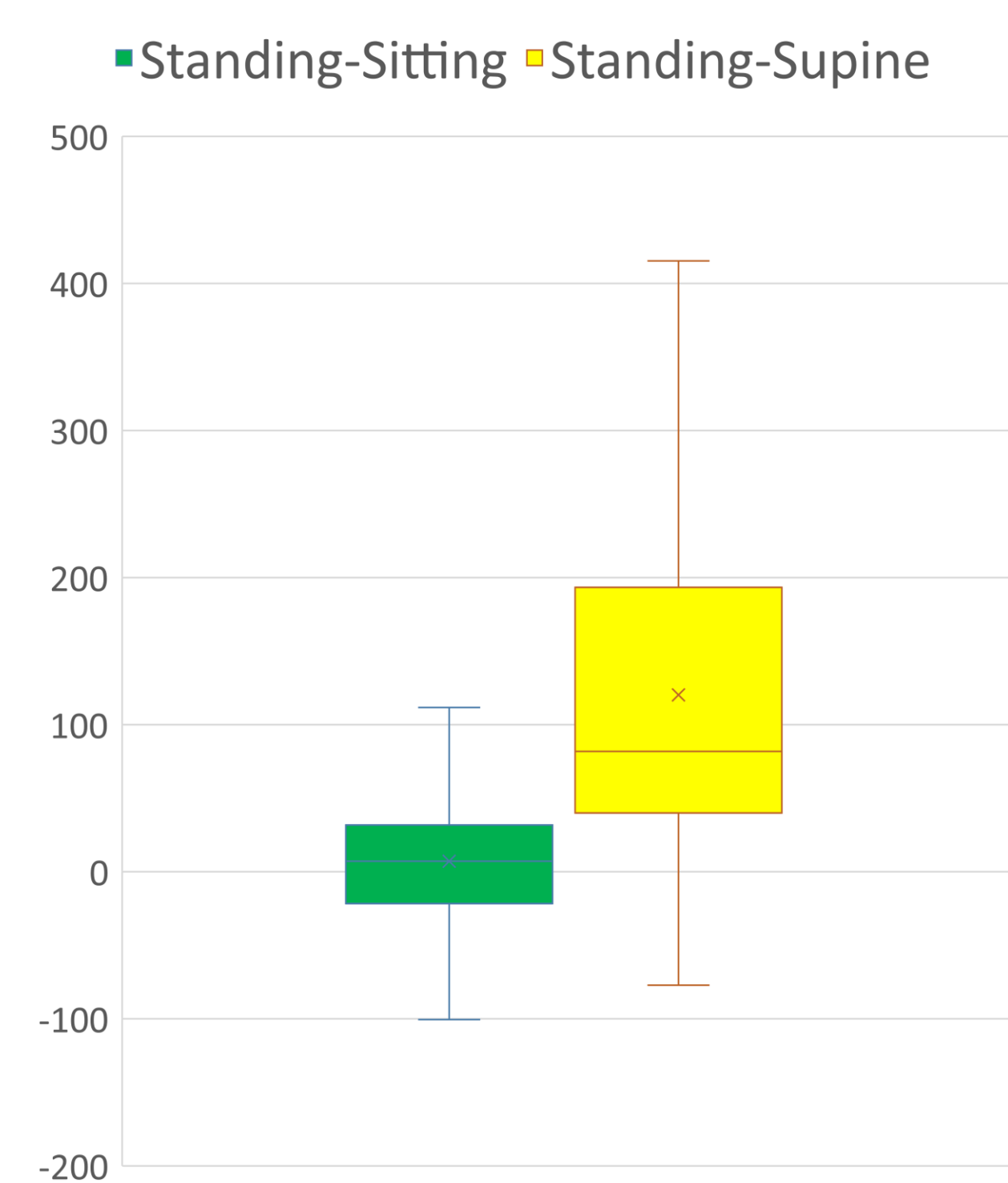


Fig. 3: Difference of measured breast volume standing vs sitting position and standing vs supine position

Conclusion

Three-dimensional volumetric assessment of breasts in supine position did not statistically correlate with the validated assessment of breast volume in standing position while breast volume in sitting position is reliable and correlates with the assessment of a standing patient. We conclude that intraoperative volumetric assessment should be performed with patients in upright sitting position.

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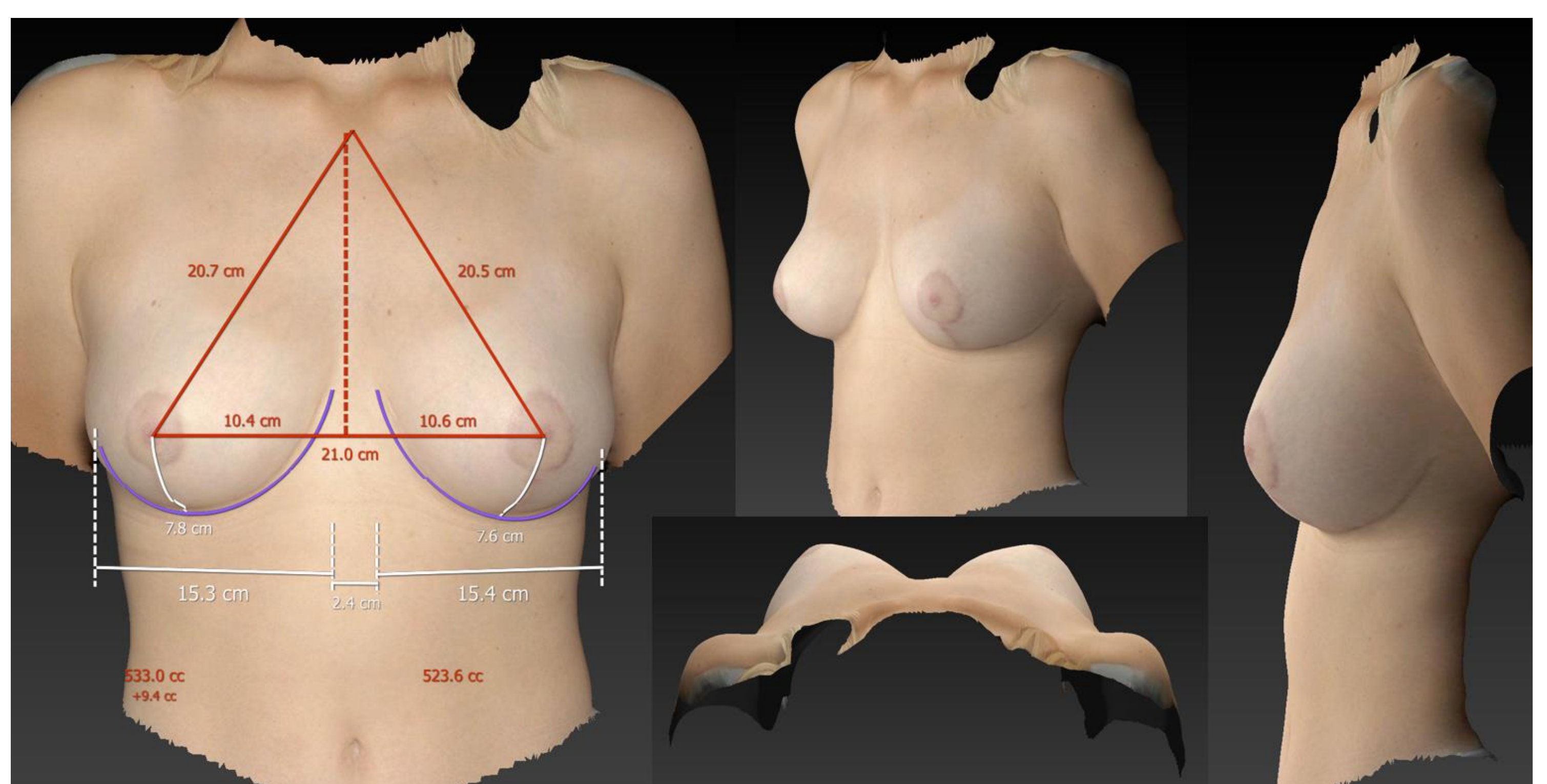


Fig. 4: 3D volumetric assessment of a patient after reduction mammoplasty (Patient 1) in standing position

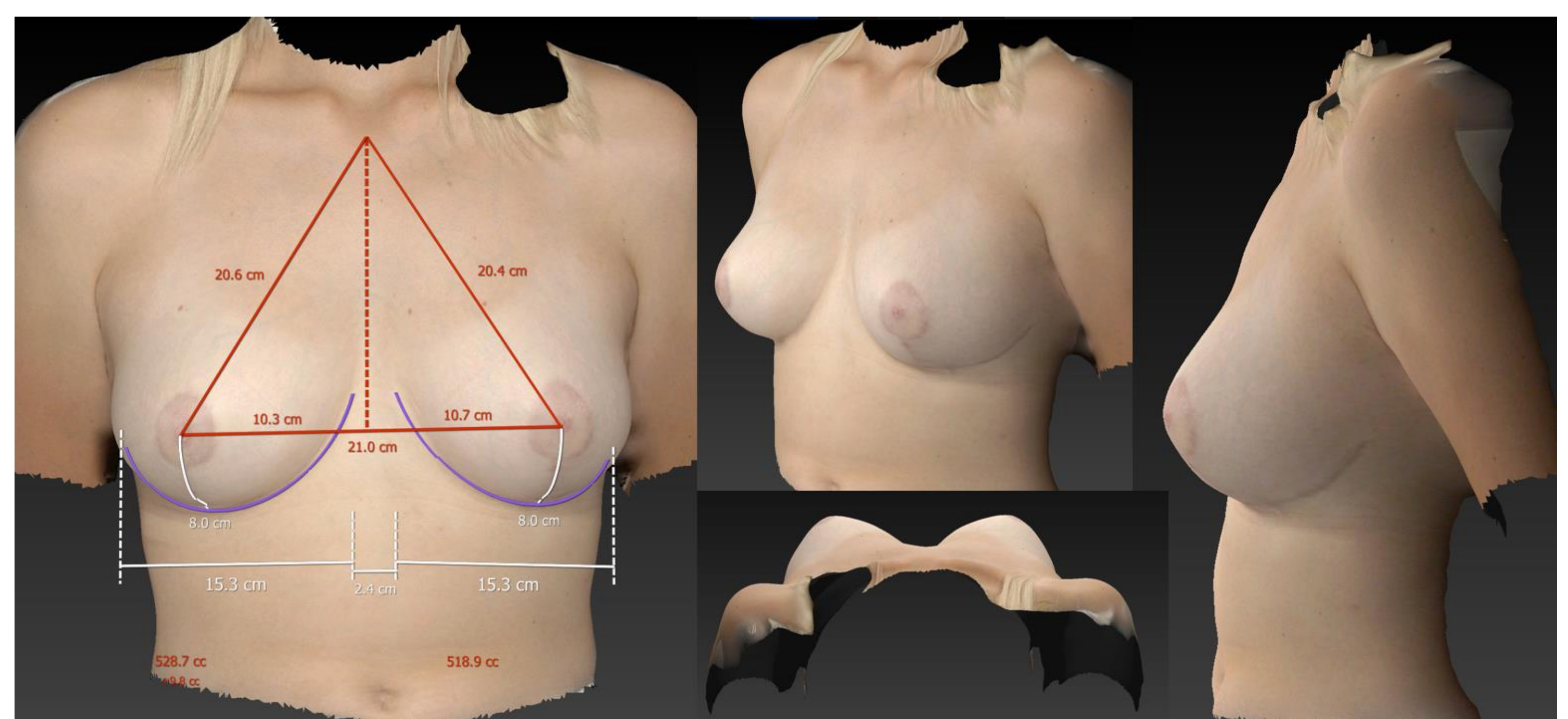


Fig. 5: 3D volumetric assessment in sitting position (Patient 1)

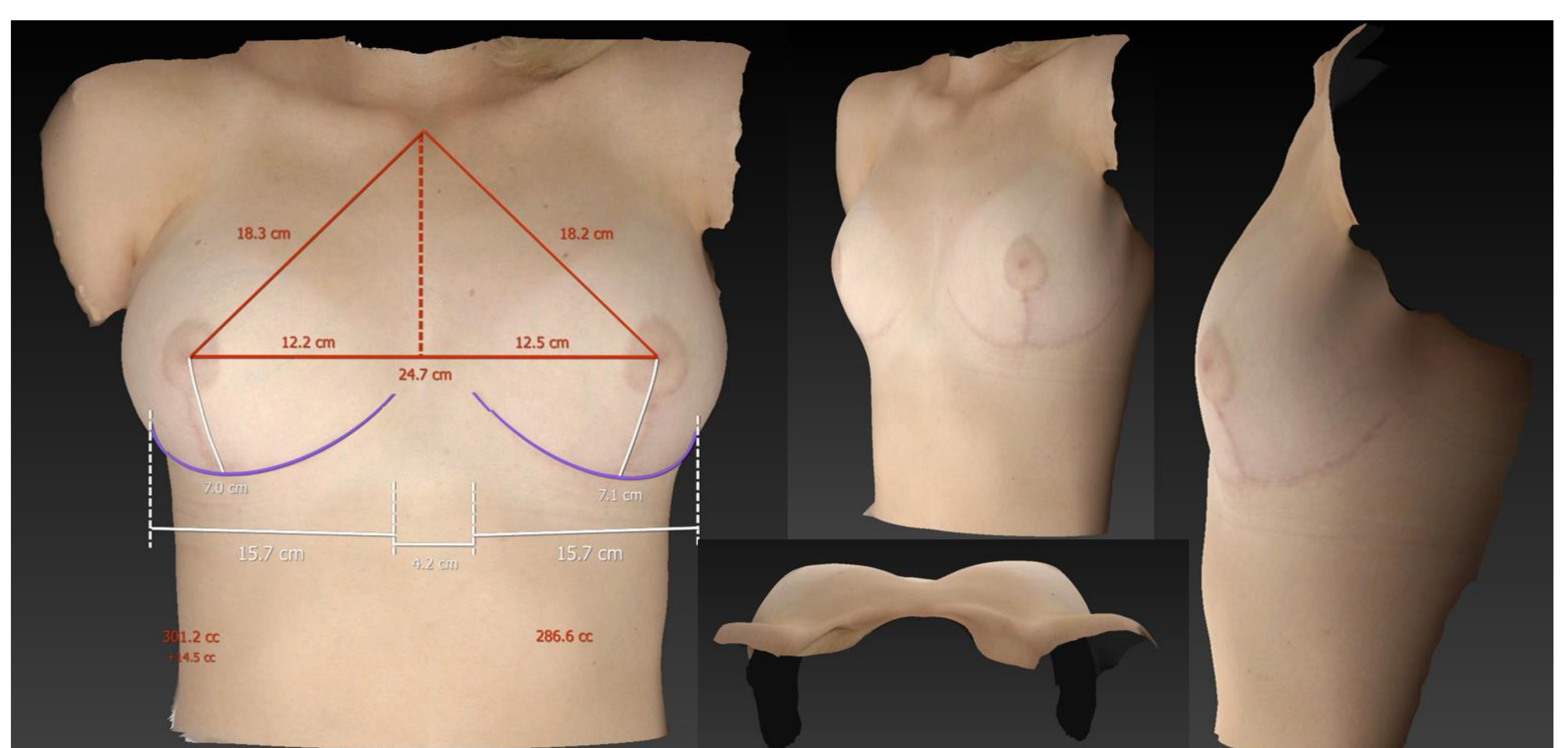


Fig. 6: 3D volumetric assessment in supine position (Patient 1)