

Imaging-Based Assessment of Omental Volume: Expanding Options for Autologous Breast Reconstruction

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Introduction

- The omentum is an alternative tissue source for breast reconstruction in patients who are not candidates for traditional autologous flaps and prefer to avoid implants
- Current approaches require laparoscopy to assess omental suitability, increasing operative morbidity and cost
- There are no established noninvasive perioperative methods to evaluate omental volume for reconstructive planning
- This study proposes the use of 3D CT segmentation to enable preoperative assessment of omental volume

Methods

- Omental volume was quantified using CT-based 3D segmentation.
- Volumes were calculated by manual measurement of individual slices and summation across the dataset.

Results

50 patients (28 females, 22 males) were included

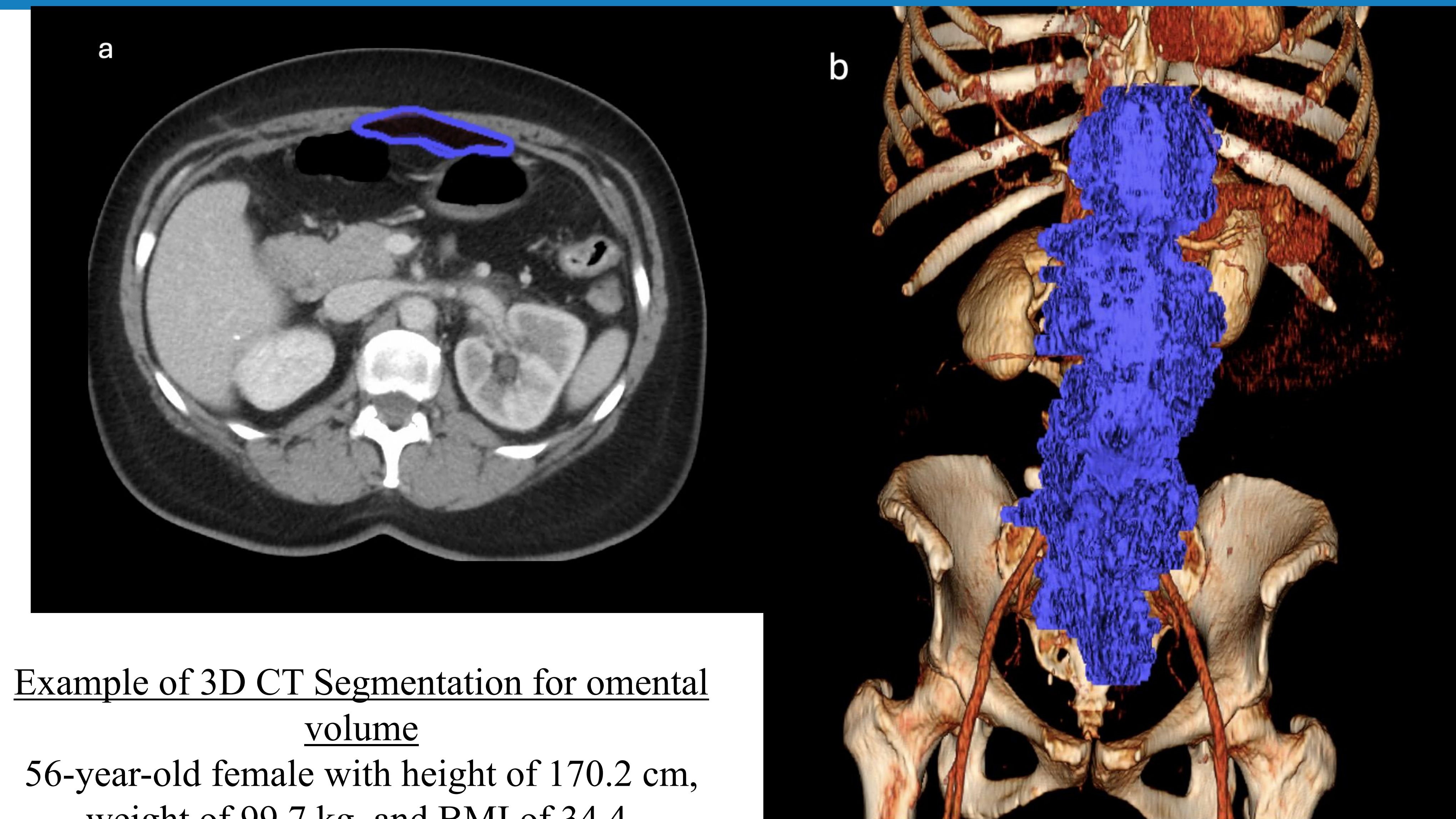
Omental volume was captured in all cases and interrater reliability assessed

Mean Height	170.4 cm
Mean Weight	102.3 kg
Mean BMI	29.4
Mean Omental Volume	166 mL
Volume Range	37–304 mL

Linear regression demonstrated a significant correlation between BMI and omental volume (regression coefficient 3.502; 95% CI 1.184-5.819, $p=0.0004$).

Height and weight alone were not significant predictors.

In a multiple linear regression model controlling for age, height, and weight, BMI continued to be a predictor (regression coefficient 3.667, 95% CI 1.338-5.997, $p=0.003$).



Example of 3D CT Segmentation for omental volume

56-year-old female with height of 170.2 cm, weight of 99.7 kg, and BMI of 34.4.

CT segmented volume of 247 mL.

- (a) Axial CT with omentum segmented (blue)
(b) 3D rendering of omentum volume (blue)

Conclusions

3D CT segmentation offers a novel, noninvasive method for preoperative omental volume evaluation.

As previously validated with hepatic volumetrics, 3D segmentation has the potential to evaluate the omental volume availability in the context of breast reconstruction, potentially reducing the need for laparoscopy.