AS11. Ovarian cancer

SO011/#834 DEVELOPMENT OF DEEP LEARNING-BASED AUTO-SEGMENTATION ALGORITHMS FOR PERITONEAL METASTASES USING COMPUTED TOMOGRAPHY IMAGE ANALYSIS OF OVARIAN CANCER

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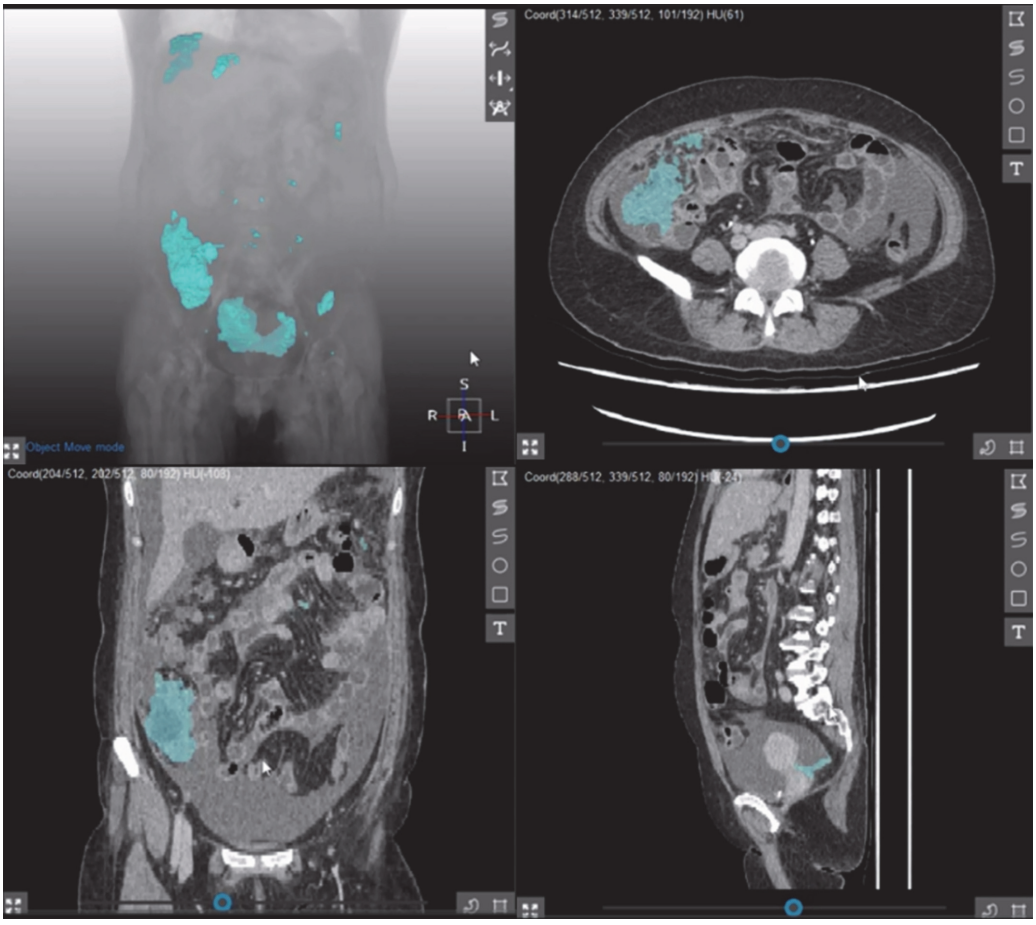
Introduction To facilitate image-guided surgery in ovarian cancer, pre-treatment diagnosis of peritoneal metastases (PM) is essential. However, manual labeling and quantifying the whole PM lesions are impractical in clinical practice. Thus, we aimed to develop a deep learning-based auto-segmentation algorithm for PM using computed tomography (CT) scan images of newly diagnosed epithelial ovarian cancer.

Methods We retrospectively collected pre-treatment CT scan images from patients with epithelial ovarian cancer who were treated at our institutional hospital. Patients were randomly assigned to training, development, and test sets with 8:1:1 ratio, and underwent 5-fold cross validation. The whole PM lesions in the abdominal-pelvic cavity of the training dataset were manually drawn by one radiologist. They also referred to surgical records and descriptions of PM lesions. 3D nnU-Net was selected as the deep-learning architecture. One radiologist manually drew the whole PM lesions in the abdominal-pelvic cavity in the test dataset twice and submitted them as references for validation.

Results Mean age at initial diagnosis was 58.2 years, and 95.5% of the study population had FIGO stage IIIB-IVB diseases. Complete resection was achieved in 57.5% of the patients. The final model was validated using corresponding test dataset, and yielded the average Dice similarity coefficient (DSC), sensitivity, and precision as 83.1%, 83.1%, and 83.9%, respectively, across all folds.

Conclusion/Implications We successfully developed a deep learning-based auto-segmentation algorithm to identify and indicate PM lesions in ovarian cancer. This model will aid radiologists' reading and facilitate image-guided surgery for advanced-stage ovarian cancer in clinical practice.



Abstract SO011/#834 Figure 1