

Radiological and morphological features of vanishing lung syndrome development in patients with COVID-19 community-acquired viral pneumonia

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Conflict of interest: none

BACKGROUND. Presently actively new direction develops in digital treatment of CT images – radiomics, that presents the result of co-operation on verge of different sciences (radiology, computer sciences and mathematical statistics). Inaccessible for the unarmed eye additional information of CT images can be got by means of their mathematical treatment and creation of the segmented histograms. Last it is possible to compare and analyse both isolated and with regard to the dynamics of physiopathology descriptions of organs and fabrics at the different human diseases.

OBJECTIVE. To define the roentgenologic and morphological features of development of vanishing lung syndrome for patients with non-hospital viral pneumonia.

MATERIALS AND METHODS. Data of CT are analysed in a dynamics for patients with non-hospital viral pneumonia of COVID-19, that were on treatment in SI “National institute of phthiology and pulmonology named after F.G. Yanovsky of the NAMS of Ukraine” or were directed from other medical establishments. The Dragonfly program from Object Research Systems (Montreal, Canada), which performs micro-X-ray structural analysis of the examined tissues, was used to analyze CT images of chest. Pathomorphological examination was performed in the laboratory of pathomorphology of the institute.

RESULTS. Monitoring of CT is conducted in the group, that consisted of 90 patients with non-hospital viral pneumonia of COVID-19. 27 (30,0 %) patients (18 men and 9 women in age from 23 to 68) are educed with the roentgenologic signs of vanishing lung syndrome. 12 from them (9 men and 3 women in age from 23 to 56) were on treatment in the institute in an acute period of disease. Other 15 patients (9 men and 6 women in age from 26 to 68) directed from other curative establishments, where they treated oneself 3-4 months ago.

CONCLUSIONS. Micro-X-ray structural analysis of data of CT allows to educe the features of changes of parenchima at development of vanishing lung syndrome. These changes are confirmed by the educed changes at pathomorphological research of postoperative preparations of lungs.

KEY WORDS: COVID-19 pneumonia, vanishing lung syndrome, CT, radiomics, histogram, digital programmatic processing, micro-X-ray structural analysis.