# Abstract 402

## A DEEP LEARNING MODEL FOR VOLUMETRIC ANALYSIS AND FOLLOW-UP OF LAMELLAR HOLE PROGRESSION

Arkan I.[2], Gumusay B.[1], Cengiz M.[1], Karsligil E.[1], Cakir A.*[2]

*[1]Yldiz Tecnical Univercity ~ Istanbul ~ Turkey, [2]Department of Ophtalmology, Prof. Dr. Cemil Tascioglu City Hospital ~ Istanbul ~ Turkey*

**Introduction:**

To evaluate the progression of the lamellar macular hole (LMH) by volumetric analysis via artificial intelligence (AI) – based on deep learning models.

**Materials and methods:**

In this observational cross-sectional, single-center study, 68 eyes of 59 patients with LMH were analyzed by spectral-domain optic cohorens tomography (SD-OCT). OCT images of the subjects were recorded in each visit for analysis throughout the follow–up period. Of the 1077 OCT images, 775 (%72) were used for training, 86 (%8) for validation, and 216 (%20) for testing. An AI approach based on convolutional neural networks (CNNs) were used to identify the lamellar hole. The OTSU thresholding method is then used to determine the boundaries of the lameller holes. Volumetric analysis was performed by applying these procedures to all OCT sections where lamellar holes were located.

**Results:**

The model was tested with 86 images. Accuracy, Mean Absolute Error (MAE), Intersection over Union (IoU), and Area Under Curve (AUC) metrics were used to evaluate the model. The accuracy of the model was found to be 0.997, MEA was found to be 0.0021, IoU was 0.608, and AUC was 0.842.

**Conclusions:**

The progression of the lamellar macular hole can be followed accurately by using volumetric analyzes obtained with the deep learning models based on artificial intelligence.