

A novel approach for remote monitoring of European exudative AMD patients using macular thickness maps



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PURPOSE

- OCT has been widely accepted as the gold standard for retinal structural visualization, but analysis of entire OCT volumes can be time-consuming and difficult to integrate in a telehealth workflow.
- In this retrospective study, we compared the ability to detect changes using macular thickness maps (MTMs) alone with the ability to detect changes using the entire OCT review station, to determine if MTMs alone could accurately predict recurrent exudation in European patients with exudative age-related macular degeneration (eAMD).

METHODS

- Retrospective data from 44 eyes of 31 European patients with eAMD imaged using CIRRUS™ HD-OCT 5000 (ZEISS, Dublin, CA) over 7 consecutive visits (a period of ≥ 2 years), were analyzed.
- Patients in this study were placed under a treat-and-extend protocol and imaged using a macula centered 6x6 mm (512x128 pixels) OCT scan.
- Three graders (retina specialists) reviewed two consecutive images that were assumed to be acquired at the patients’ home.
- Graders were asked to determine if there were changes that warranted a full clinical assessment after viewing two consecutive scans using one of the two data sets: MTMs alone (Figure 1) or using the entire CIRRUS review station to evaluate all the information contained in the OCT scans.

RESULTS

- A total of 257 pairs of images were reviewed by each grader for each exercise.
- The consensus ground truth was reached by the graders using a CIRRUS review station to evaluate all the information contained within the OCT scans.
- For the 257 images, the majority recommended clinical assessment was warranted in 61 cases.
- When comparing the majority agreement on the MTM exercise with the ground truth, there was 83.27% agreement.
- The inter-grader agreement between all 3 graders when viewing macular thickness maps alone was 81.32% and the inter-grader agreement between all 3 graders when viewing the entire review station was 79.77%.
- The Fleiss Kappa was highest when using thickness maps alone, and both exercises resulted in a substantial level of agreement.

Scenario	3 graders – Thickness Maps	3 graders – CIRRUS Review Station
# of scan pairs	257	257
# of matched scans	209	205
Agreement %	81.32	79.77
95% Confidence Level	(76.01, 85.90)	(74.33, 84.50)
Fleiss’ Kappa	0.71	0.64

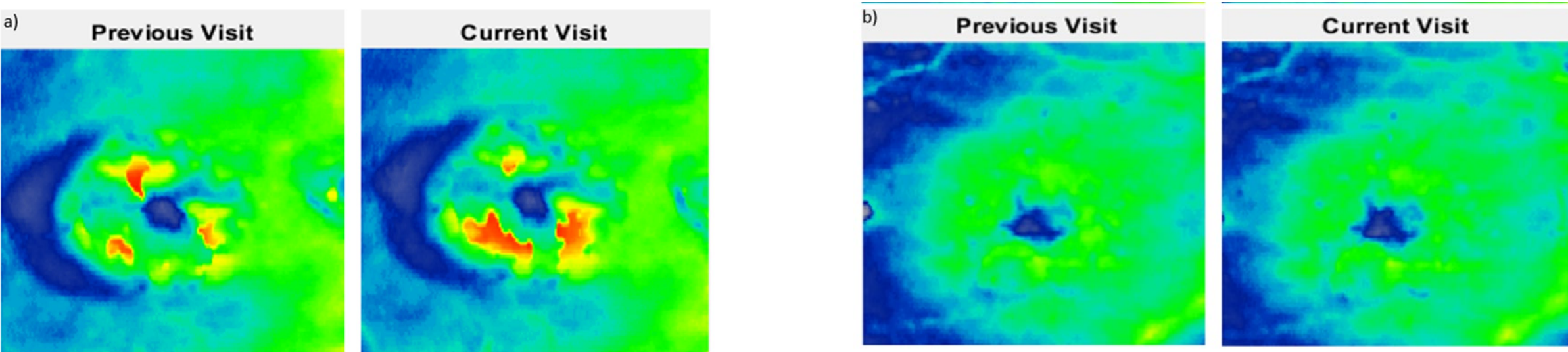


Figure 1. Examples of consecutive MTMs: a) Clinical assessment needed; b) Continue remote monitoring

CONCLUSIONS

This study demonstrates that in European eAMD patients, MTMs alone may be a useful tool in determining recall if monitoring patients remotely.