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VIDEO REPORT ....

A new approach for visualisation of dye leakage in fluorescein angiography

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ABSTRACT

Introduction: Fluorescein angiography (FA) is the more common investigation performed for macular diseases.[1] Frozen FA pictures are obtained but direct visualisation of the kinetics of FA is possible only once, by the investigator. The kinetics of FA examination is imagined from static FA pictures based on our experience.[2 3] We evaluated a new software that re-create automatic pseudo-movie from static pictures, in order to share the visualisation of dye leakage.

Methods: EyeToolkit software (EDC Lamy EyeToolkit software, EDC LAMY, Carvin, France) performs an automatic and rapid overlay (0.5 to 3 seconds) from the different angiographic frames. Five images from the same examination, from early to late phase, are required to generate a movie. The resulting movies could be seen either with the EyeToolkit software or be exported to video format. We submitted a minimum of six images issued from printed photographs or any digital instrument (Topcon retinal camera, TRC-50, Topcon, Tokyo, Japan; Heidelberg Retina Angiograph, HRA 2, Heidelberg Engineering, Heidelberg, Germany), to the EyeToolkit software: sequences of fluorescein angiograms of patients harbouring various patterns of exudative age-related macular degeneration (AMD), with or without treatment, were selected in order to visualise active leakage of dye and to differentiate it from staining. In addition, we submitted to the EyeToolkit software images issued from one single FA examination (early phase to 10′) in case of central serous chorioretinopathy (CSC), in order to see the kinetics of the leakage and to visualise leakage of dye from active areas of CSC.

Comment: We evaluated two kinds of leakage: chorio-retinal leakage from choroidal new vessels (CNVs) due to AMD, and retinal leakage from active areas of CSC. In exudative AMD patients, the rapid overlay (<10′′) applied in a movie mode obviously demonstrated the progressive enlargement of the hyperfluorescence, materialising the leakage of fluorescein from CNVs. The FA movies generated with EyeToolkit permitted to clearly see the active leakage from a newly diagnosed classic CNV (Video 1), and from a newly diagnosed minimally classic CNV (Video 2). Moreover, the FA movies generated with EyeToolkit permitted to easily detect the minimal leakage from a still active classic choroidal neovascularisation previously treated by photodynamic therapy (PDT) (Video 3), and to visualise the filling of the vascularised pigment epithelium detachment from an occult choroidal neovascularisation previously treated by PDT (Video 4). In CSC, the FA movies generated with EyeToolkit permitted to see the kinetics of the classic smokestack-type leakage (Video 5) and to easily visualise leakage of dye from active areas of CSC (Video 6). EyeToolkit software is a new automatic and efficient tool for a rapid overlay of images, obtaining an angiographic movie from any image. It leads to easy visualisation of leakage from CNVs and from active areas of CSC; thus, owing to the easy differentiation of active leakage from staining, EyeToolkit software would seem particularly helpful for the decision of treatment and re-treatment. Easy visibility of the kinetics of the dye in angiography, in a movie mode, also represents a useful approach for teaching. Based on this preliminary analysis, this software can be considered for (1) recreating pseudo-kinetics of dye in retinal angiography, (2) easy sharing of retinal angiograhy; voice comments can be included within the file, and (3) teaching and e-learning. The comparative evaluation of the generated movies versus classic angiographic pictures must validate its use for diagnosis and indications of treatment.

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