Novel automated processing techniques of fluorescein angiography (FA) images in patients with Uveitis

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ABSTRACT

• Fluorescein angiography (FA) is a diagnostic imaging modality to visualize abnormalities in retinal and choroidal circulation such as vascular leakage.
• There is a need of objective quantification and detection of vascular pathology in uveitis.
• We demonstrate the potential of two novel automated processing techniques to detect leakage in FA images.

METHODS

• Images used in this study belonged to patients enrolled in the Uveitis/Intraocular Inflammatory Biobank (iBank) protocol at the NEI who underwent FA using the Optos 200Tx (Optos plc, Dunfermline, United Kingdom)
• Individual early and mid-phase angiographic images were selected if vascular leakage was identified by expert readers.
• Patient images were excluded in the cases of poor image quality, media opacity and severe artifacts obscuring view.
• Angiographic Images were retrospectively downloaded, removed of patient identifying information, and exported to analysis software.

RESULTS

LIMITATIONS & FUTURE DIRECTION

Limitations:
• Different FOVs in FA videos in the same clinical practice
• Distortion of images due to eye movement and blinking
• Interframe motion cannot be modeled as rigid
• Uveitis: vitreous haze could confound visible media

Future Directions:
• Refinement of algorithms + deep learning integration
• Reproducibility and repeatability across multicenter trials
• Explore skeleton structure as predictor/marker of disease

CONCLUSION

Our methods of FA image processing provides two novel algorithmic approaches to identifying leakage in patients with uveitis. Further refinement is warranted to apply to real-world patient care.

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