

Longitudinal analysis of AF in NHP baseline *in vivo* retinal images

Alex Matov
January 2023

Computer vision objectives

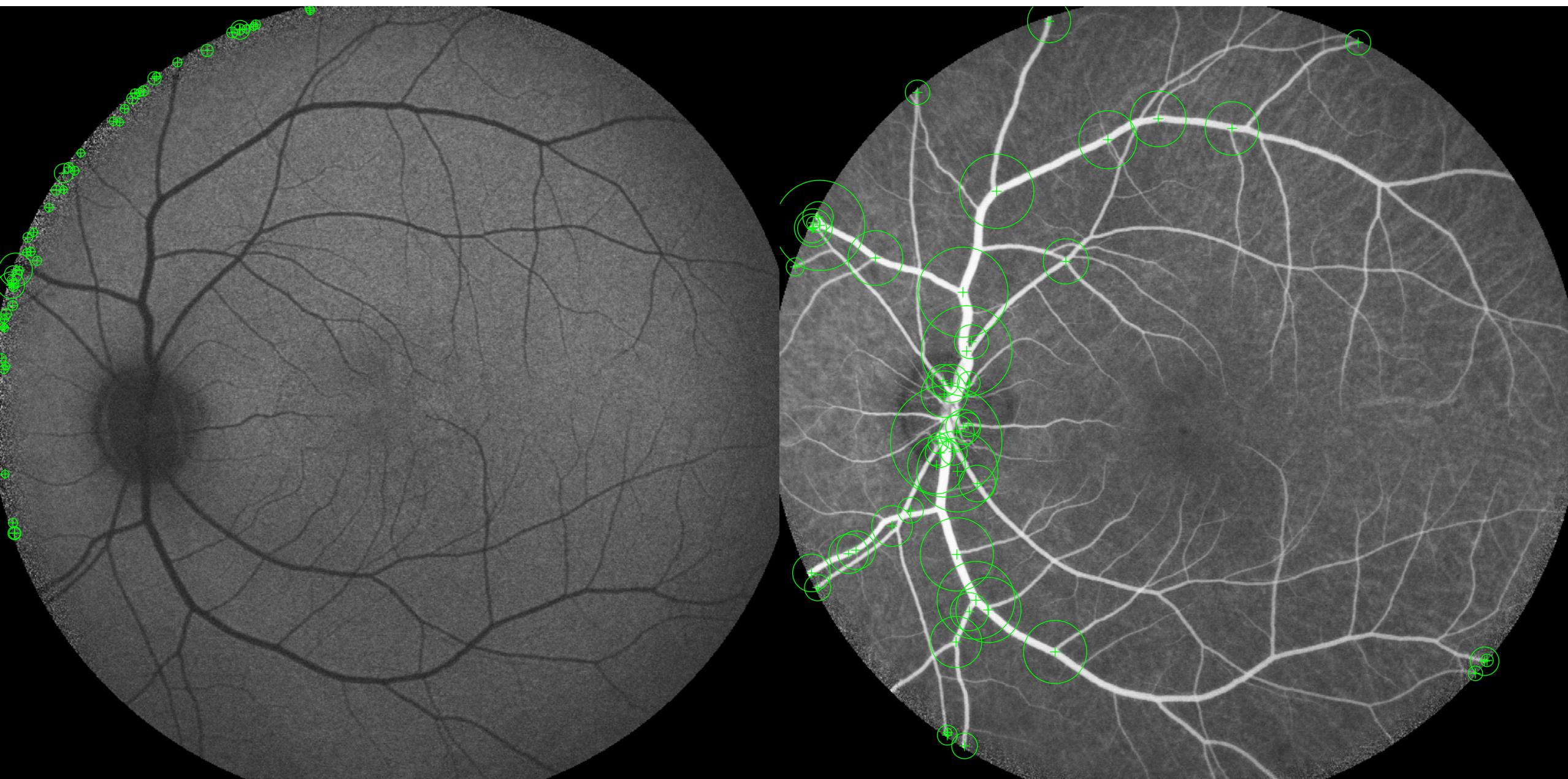
- Utilize NHP eye imaging data to develop an automated computer vision software algorithm for the automated detection and quantification of hyper-fluorescent signals on fundus fluorescence images
- Identify the presence of auto-fluorescent signal at prior to injection
- Compare pre- and post-injection images for Visit 1 (prior to surgery-induced disease) to determine if there are increased number of hyper-fluorescent puncta after injection (determine specificity of methodology)
- Compare pre- and post-injection images for Visit 2 (~1 month after surgery-induced disease) to determine if there are increased number of hyper-fluorescent puncta after injection
- Compare Visit 1 and Visit 2 post-injection images (by same time point(s), by eye)

Summary of data & findings

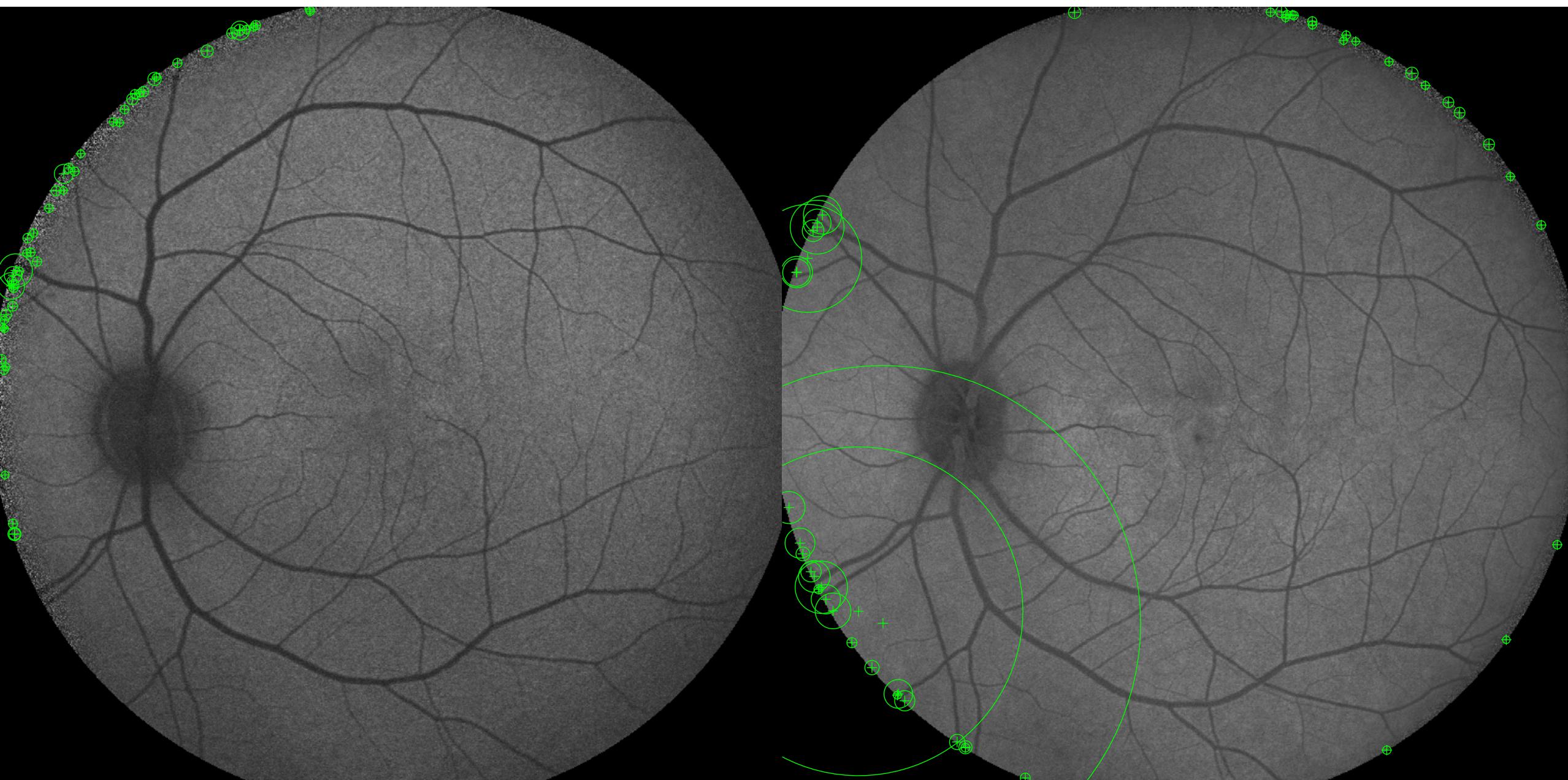
- 24 eyes from 12 NHP over 2 visits 3 months apart
- AF channel images were acquired prior to and 2 min, 5 min, 15 min & 20 min post dye injection
- 2 of 13 eyes exhibit no auto-fluorescent (AF) puncta prior to injection
- Multiple analysis parameters to optimize:
 1. Detection -> contrast threshold, edge threshold, #layers in SIFT octave, Gauss filter sigma
 2. Matching -> method, match threshold, max. ratio, distance metric, uniqueness

Number of detected AF puncta per eye

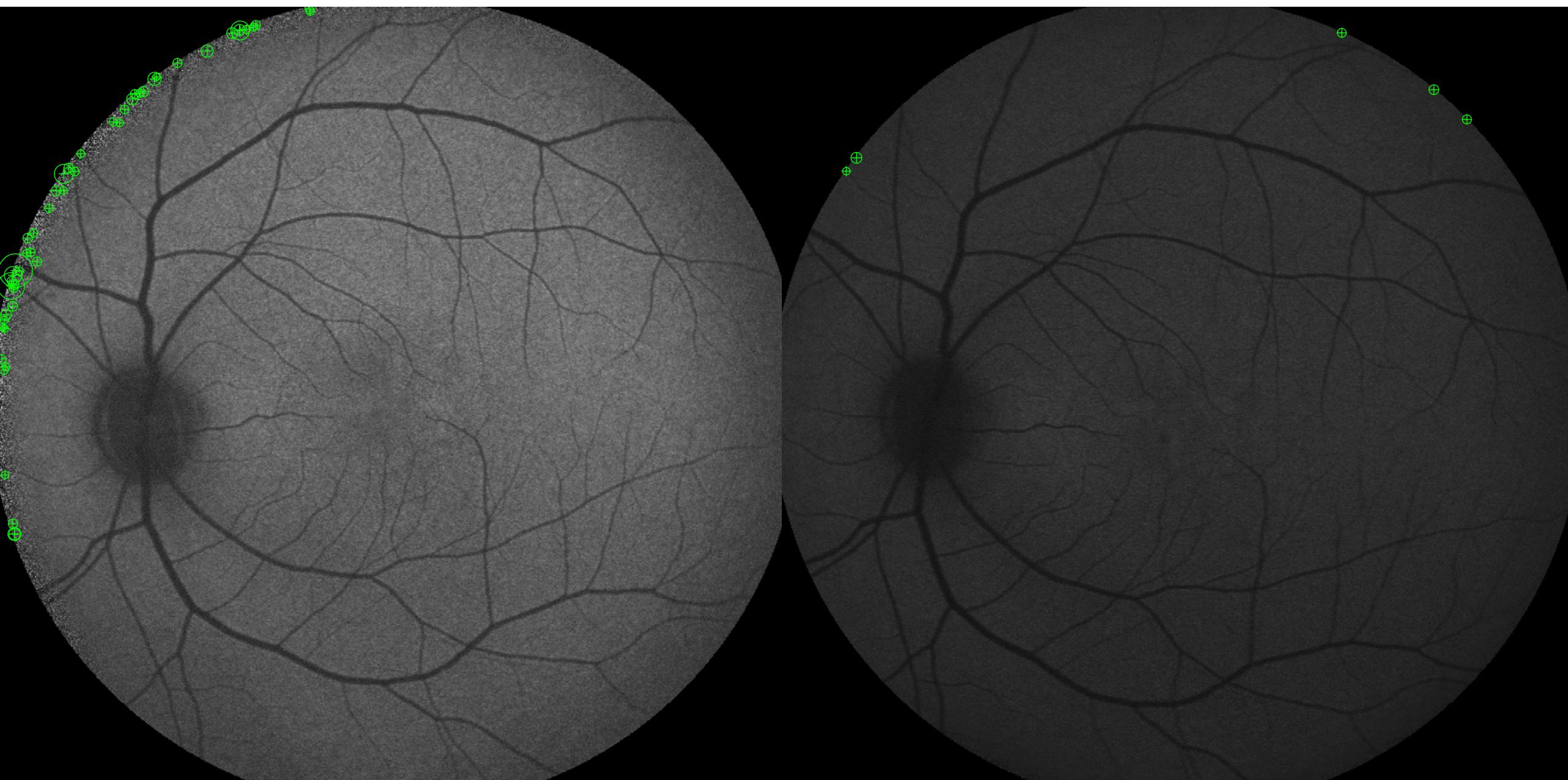
Cyno 191817 OS, V1 Pre-inj vs V1 Post 2min



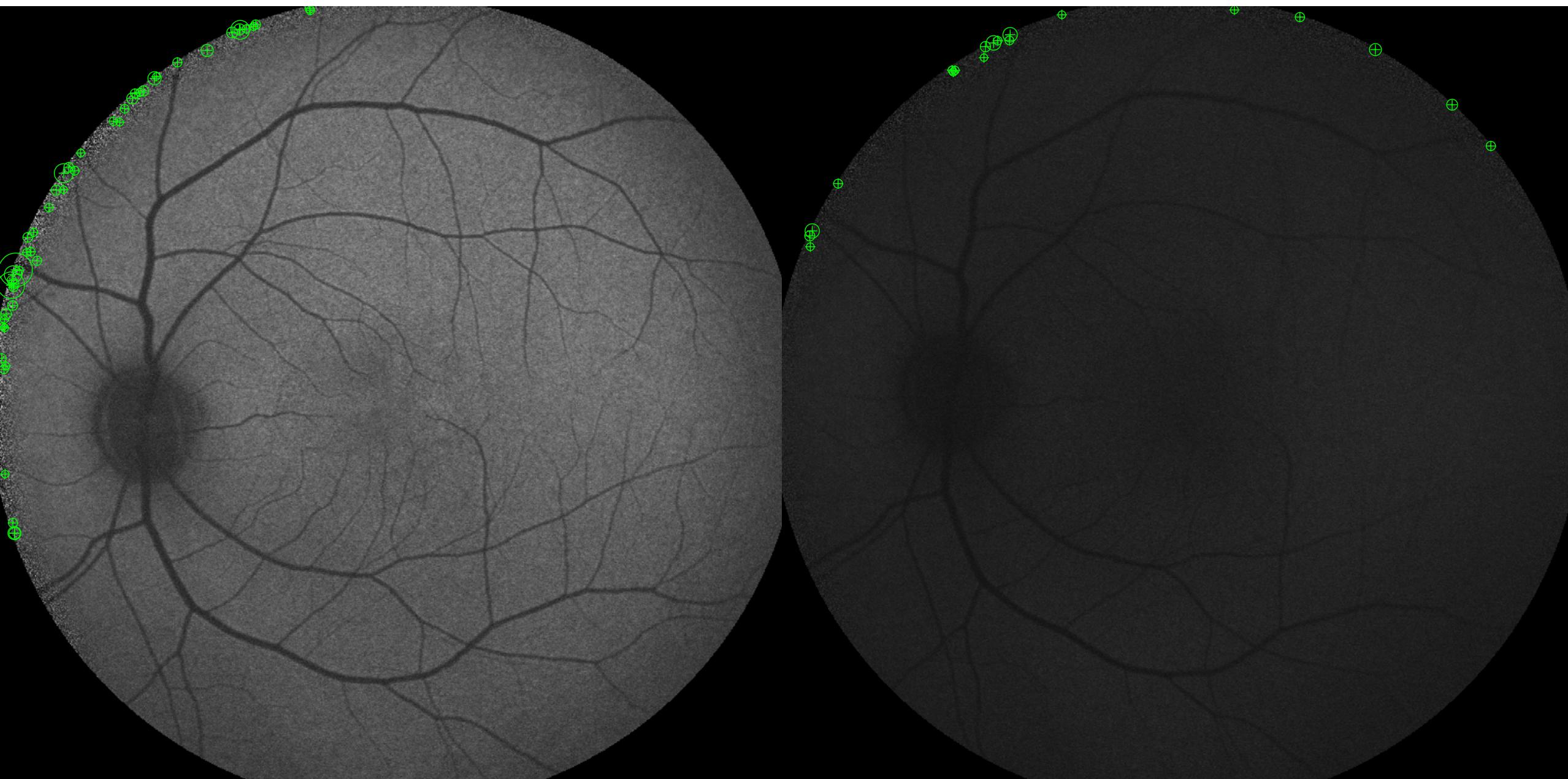
Cyno 191817 OS, V1 Pre-inj vs V1 Post 5min



Cyno 191817 OS, V1 Pre-inj vs V1 Post 15min



Cyno 191817 OS, V1 Pre-inj vs V1 Post 30min

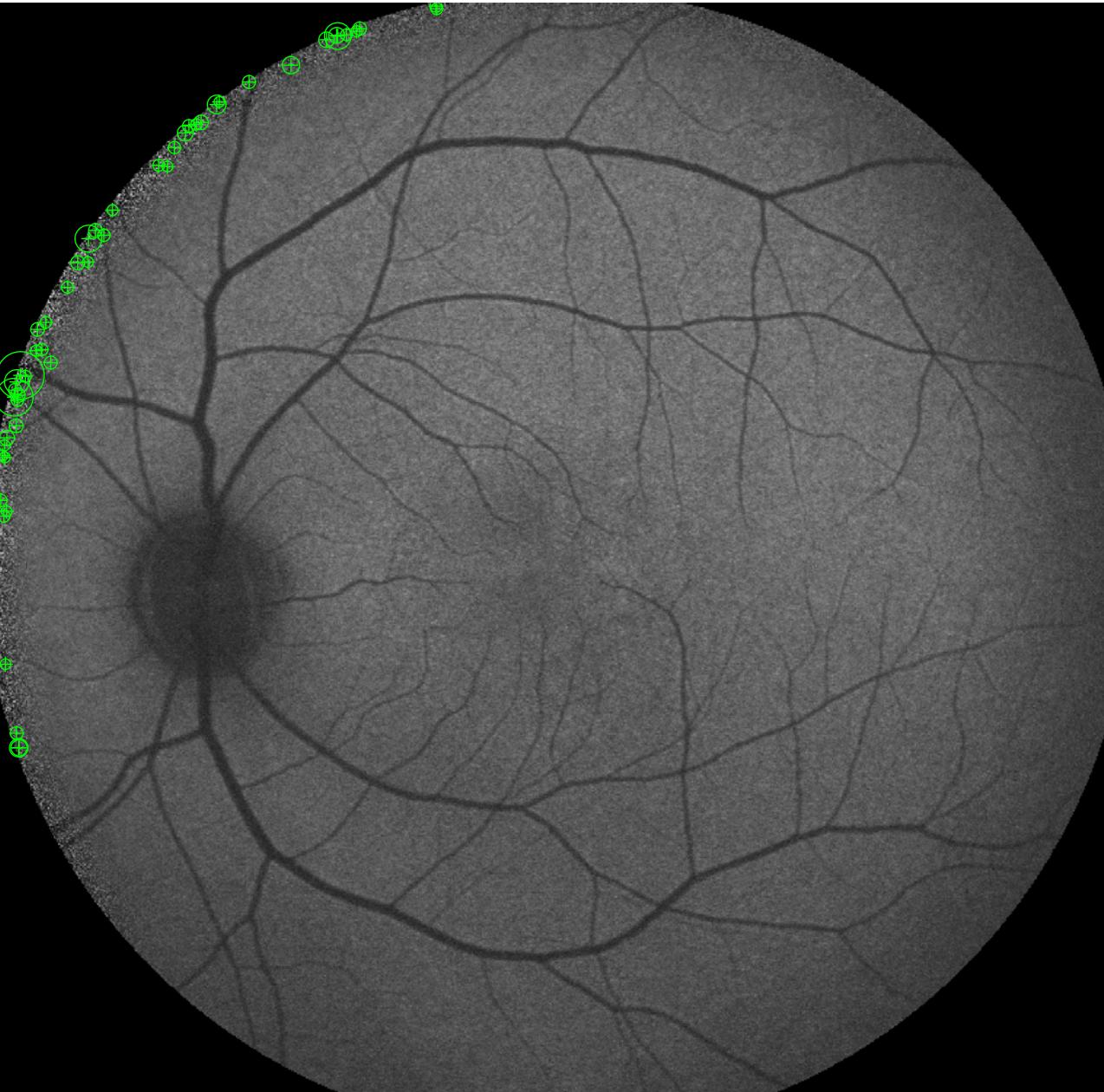


Cyno 191817 OS, V2 Pre-inj vs V2 Post 2min



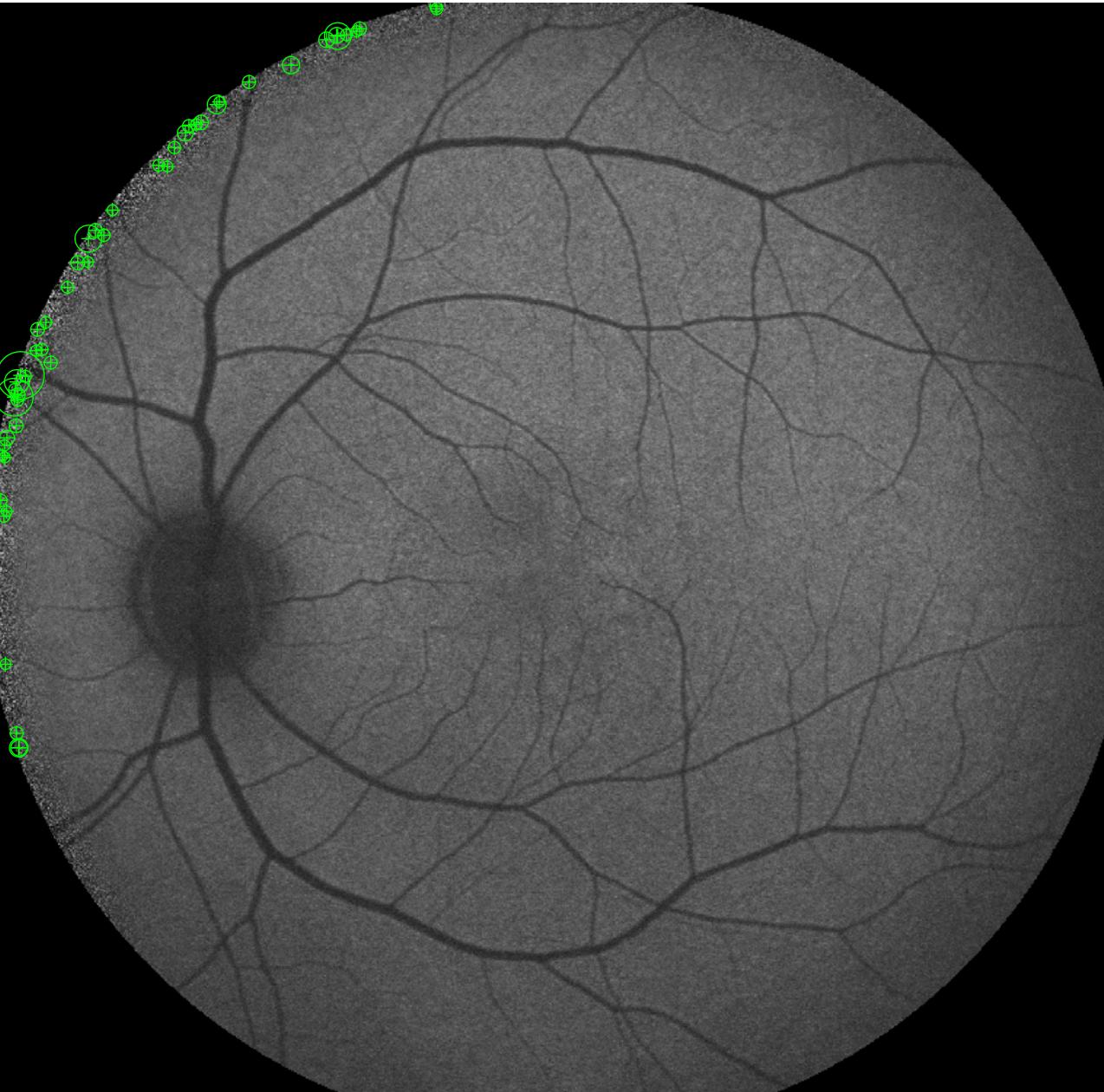
Data for Visit 2 is the same as Visit 1
with a time stamp from October

Cyno 191817 OS, V2 Pre-inj vs V2 Post 5min



Data for Visit 2 is the same as Visit 1
with a time stamp from October

Cyno 191817 OS, V2 Pre-inj vs V2 Post 15min



Data for Visit 2 is the same as Visit 1
with a time stamp from October

Cyno 191817 OS, V2 Pre-inj vs V2 Post 30min



Data for Visit 2 is the same as Visit 1
with a time stamp from October