Introduction
Age-related macular degeneration (AMD) can often lead to the loss of foveal vision and the surrounding central visual field. This type of visual loss is extremely common (affecting nearly 7% of individuals over 40 in the United States alone) and can present particular challenges for oculomotor tasks that rely on the high-acuity foveal retina. For certain tasks, individuals develop a new, eccentric fixation area – the preferred retinal locus (PRL).

Methods
- Participants: 8 AMD participants (75-95, 5M, 4 binocular scotomas); 4 age-matched controls (72-76, 1M)
- Eye Tracking: PupilLabs head mounted, binocular tracker (120 Hz)
- Head Tracking: Head-mounted IMU (LPMS)
- Task: pursuit of a 1° spot, modified step ramp paradigm, 6 directions (0°, 90°, 135°, 180°, 270°, 315°) at 10°/s

Head movements along each movement axis (yaw, pitch, roll) with velocity peaks greater than 2 deg/s are plotted for each trial and participant. Black vertical line indicates target onset. Trace color indicates magnitude & direction (bluer: rightward/up, redder: leftward, down). Controls have overall greater head stability, but both groups have significant movement in target direction during pursuit.

Head movements started significantly later than eye movements for both groups (p < 0.0001). Participants with macular degeneration had longer head and eye latencies than controls (p < 0.0001).

Eye movements on a majority of trials for both groups started signifi cantly later than target onset. Lag between eye and head onset did not differ between groups (medianAMD = 0.189 s, medianCont = 0.132 s).

Overall, the AMD group starts tracking the target later than the control group.

Conclusions
- Both participants with AMD and age-matched controls use multiple eye and head control pursuit strategies.
- Usually head movement starts later than the eye to increase total gaze displacement.
- Overall, the AMD group starts tracking the target later and the head stability is reduced compared to controls.
- Disease severity does not affect head tracking but may affect eye movements.

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