



Pupil-Based Detection of Asymmetric Glaucomatous Damage –

Comparison of the Konan RAPDx Pupillograph, Swinging Flashlight Method & Magnifier-Assisted Swinging Flashlight Method

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Purpose

- Afferent pupillary defect (APD) testing is most commonly performed using the swinging flashlight method (SFM).
- The magnifier-assisted SFM (MA-SFM), which involves holding a +20-diopter lens in front of the eye, has previously been found to increase the sensitivity of APD detection.
- Pupillography devices, such as the Konan RAPDx, may also allow for improved APD detection, while providing objective measurements of pupil response parameters.
- This study aims to compare the ability of the RAPDx pupillograph with the SFM and MA-SFM in the detection of asymmetric glaucomatous damage.

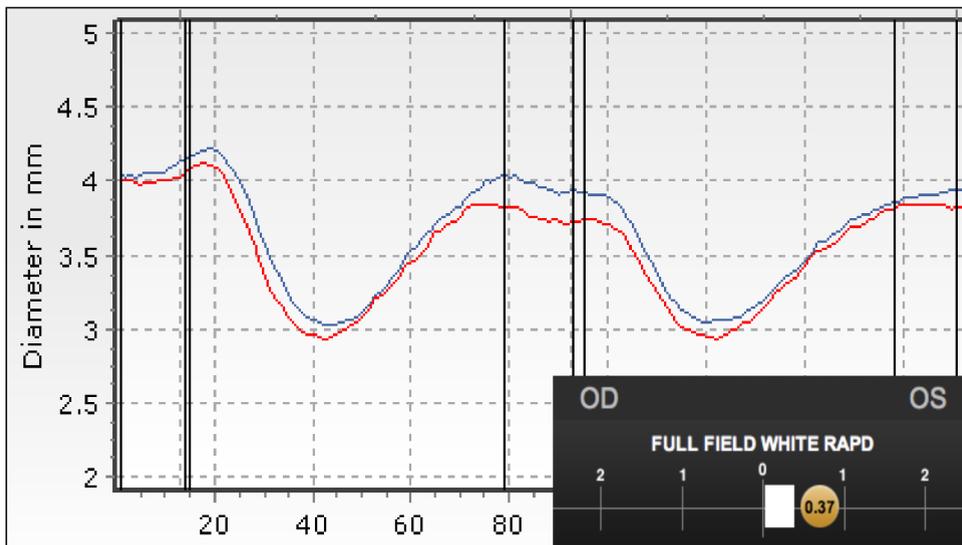


Figure 1: Pupil response curves

- Actual pupil response curves from a patient with a +RAPD in the left eye. Red curve is OD, blue curve is OS. Testing sequence: 0.1-second stimuli, 2-second pauses between stimuli.
- The Amp_c (0.37 OS) is recorded as seen in the screenshot in the bottom right. The amplitude of constriction is smaller when light is directed into the left eye (i.e. +APD).

Methods

- **Patients:** 118 patients with glaucoma were tested with the SFM, MA-SFM, and RAPDx.
- **Examiners:** Separate examiner for each test, blinded to patients' clinical data and results of other tests.
- **“Apparent” APD:** With SFM/MA-SFM - defined by presence of immediate or delayed pupillary dilation. With RAPDx - defined by a calculated index of defect (Amp_c) > 0.2.
- **“Corroborated” APD:** An apparent APD was considered “corroborated” when there was a difference of (a) ≥ 1 Disc Damage Likelihood Scale unit between both eyes or (b) ≥ 0.1 cup/disc ratio between both eyes (Figure 2).

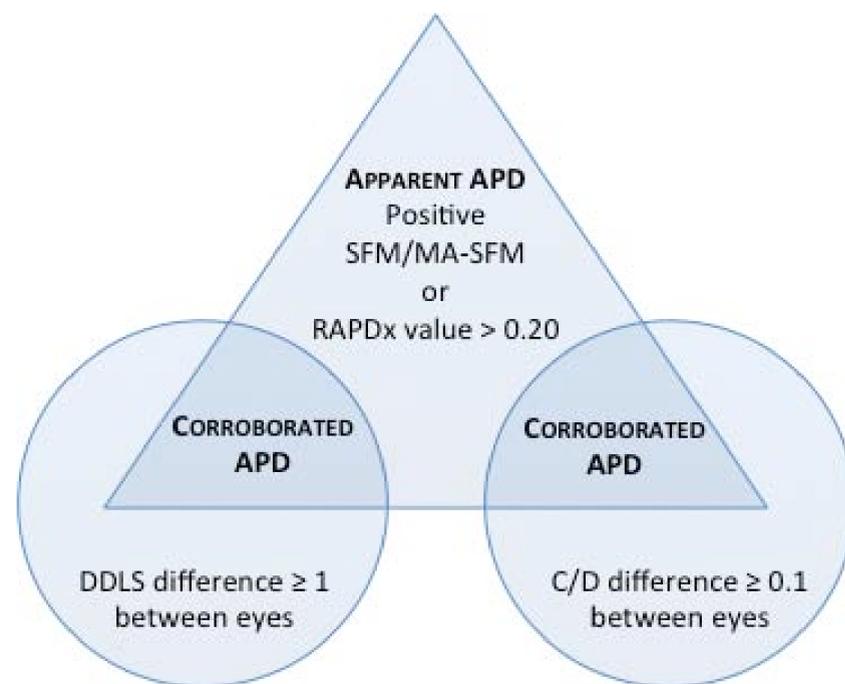


Figure 2: Apparent and corroborated APD methods

Results

- **Excluded:** 39/118 patients excluded because of retinal disease or insufficient clinical data.
- **Unable to Complete:** 22 patients (18.6%) were unable to complete pupillography testing for reasons such as ptosis and irregular or fixed pupils.
- **APD Detection:** Frequencies of “apparent” and “corroborated” APDs detected by SFM, MA-SFM, and RAPDx are shown in Table 1.
- **Clinically detected asymmetry in disc damage was missed** in 49.1%, 21.1%, and 21.1% by the SFM, MA-SFM, and RAPDx, respectively (Table 1).

Table 1: APD detection and asymmetric disc damage missed by testing method

	“Apparent” APDs Detected	“Corroborated” APDs Detected	Asymmetric Disc Damage Missed
SFM (n=57)	26.3%	15.8%	49.1%
MA-SFM (n=57)	61.4%	36.8%	21.1%
RAPDx (n=57)	61.4%	38.6%	21.1%

Conclusions

- The RAPDx pupillograph and MA-SFM are useful tools in the detection of asymmetric glaucomatous damage and are able to detect apparent and corroborated APDs more often than the SFM.

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