

School of Health

and Life Sciences

MSc Clinical Ophthalmology & Vision Research

Project/Dissertation

**TITLE:** Shape processing in macular disease

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**Abstract**

**Purpose**

To measure shape discrimination performance in individuals with macular disease, with a view to exploring the possibility of using such a task as a new sensitive screening test for detecting macular diseases at early stages. In this study, the ability of observers with macular diseases to discriminate RF patterns from circles was investigated and compared to the performance of the age-matched controls.

**Methods**

A total of thirteen subjects were recruited for the study (age range, 21 – 86 years); five eyes with macular diseases, eight age-matched normal eyes, and ten young normal eyes. The stimuli used in the study were radial frequency (RF5) patterns, in four conditions; fully and partially modulated pattern with 4, 3, and 1 modulated cycles. The mean radius of RF pattern was 1.5 degrees, and the peak spatial frequency was 4 cycle/deg. A two-alternative forced-choice adaptive (staircase) method was used, with 40 trials displayed in each block.

**Results**

Eyes with macular diseases had significantly higher RF detection thresholds than the age-matched control eyes, and the detection thresholds for fully modulated patterns did not correlate significantly with the degree of the visual loss. Moreover, subjects with unilateral macular disease showed lower performance in the eyes with macular disease than in their healthy fellow eye.

**Conclusions**

The results obtained from our study using the adaptive method were comparable to the previous studies, and the main finding of the study was that patients with macular disease showed deficits in performing the RF discrimination tasks. The sensitivity of this test in detecting visual impairment caused by maculopathy suggests that shape discrimination tasks can serve as a potential screening test.