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73 The Digital Cullen Chart: An App to Assess the Visual Field in the Context of Sellar/parasellar Tumours

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Aim: 30 years ago, Cullen1 (a neuro-ophthalmologist) developed and validated a simple paper chart for evaluation of the central 25 degrees of the visual field. We re-developed this concept in digital form (as a smartphone application) and sought to assess its sensitivity and specificity in detecting field loss, through comparison with formal machine-based perimetry.

Method: A case series pilot study was performed to test the app-based Cullen chart for concordance with formal machine-based perimetry (Humphrey and Octopus). 18 patients with a range of sellar/parasellar tumours (pituitary adenoma, craniopharyngioma, and meningioma) being managed in a single neurosurgical centre were involved in this study. Patients underwent formal visual field perimetry as part of standard care. They also underwent assessment using the smartphone-based Cullen chart as part of routine outpatient assessment. 37 eye episodes were assessed, incorporating pre- and post-treatment assessment for a range of potentially compressive pathologies.

Results: The digital Cullen chart had a sensitivity of 75% and specificity of 98% compared with machine-based perimeters. The positive predictive value was 93% and negative predictive value was 92%.

Conclusions: In the context of visual field assessment for patients with sellar/parasellar tumours, this smartphone-based chart shows strong concordance with machine-based perimeters. It is therefore an accessible visual field screening and monitoring tool for clinicians. With further study, there is also potential for approval as a remote patient-led visual field monitoring method.