

Mobile phone video detection of ectopia lentis in Homocystinuria using a solar powered low cost ophthalmoscope?

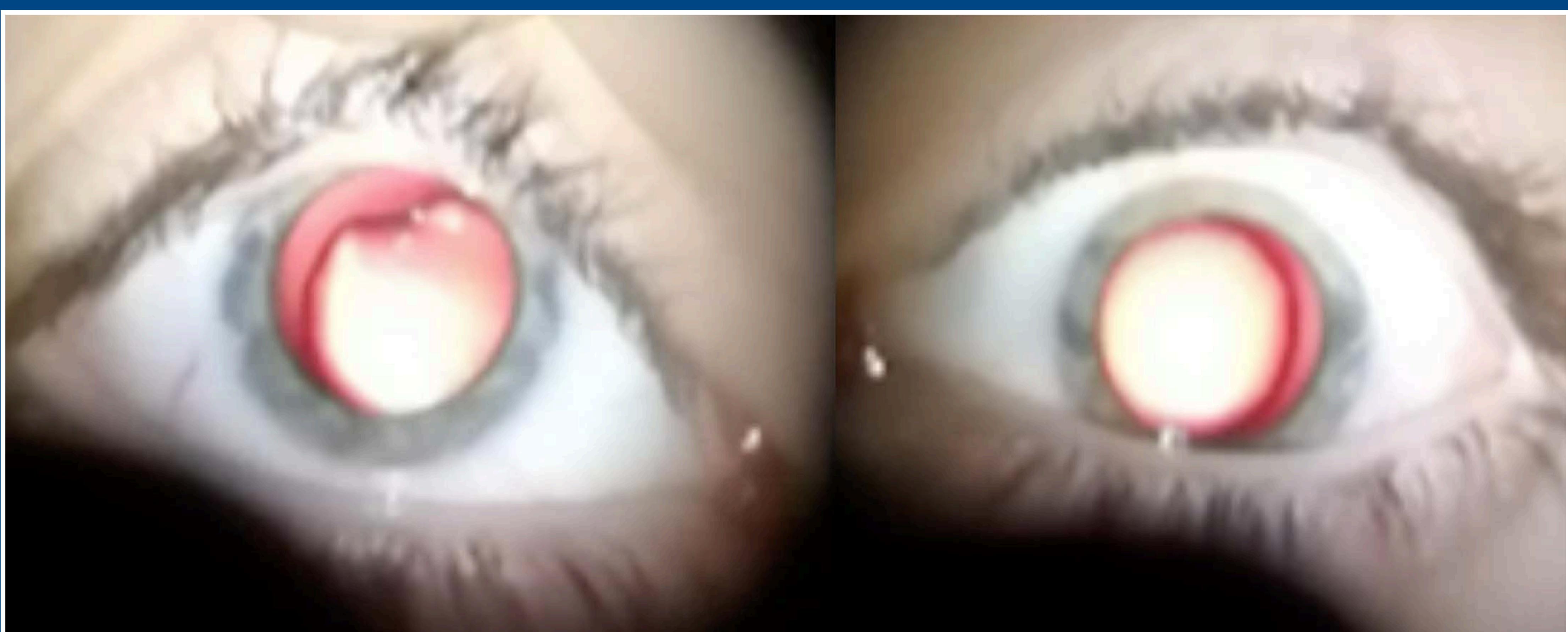
T Changulani, P Wilson, A Blaikie
Queen Margaret Hospital

Introduction

- The Arclight is a pocket-sized solar powered low cost ophthalmoscope created with the needs of users in low resource settings in mind.
- It can easily be attached to a mobile phone to record 'red reflex' and direct ophthalmoscopy findings.
- We present a case of a 7 year old boy who was diagnosed with ectopia lentis using an Arclight attached to a mobile phone camera which assisted in making a final diagnosis of homocystinuria.

Case Report

- A 7-year-old boy was referred by his optician for progressive myopic shift from -5 to -15 dioptres.
- Visual acuity was reduced despite correction (20/80 Both Eyes).
- He had no systemic features of connective tissue disease and had some mild learning and behavioural difficulties but was attending mainstream school.
- Dilated 'red reflex' examination using an Arclight ophthalmoscope (1,2) attached to a mobile phone camera (Figure 1) demonstrated bilateral inferonasal lens subluxation (Figure 2) with prominent phacodonesis in the right eye (Video Link 1).
- In view of the findings and the associated learning difficulties a diagnosis of homocystinuria was suspected. Blood tests subsequently confirmed cystathione-beta synthetase deficiency. He was treated with vitamin B12 injections, oral folic acid and pyridoxine with improvement of corrected visual acuity to 20/25 in both eyes as well as his learning and behavioural difficulties. This case for the first time demonstrates the benefit of illustrating lens subluxation and phacodonesis in homocystinuria using a low-cost Arclight direct ophthalmoscope attached to the camera of a mobile phone. This approach offers opportunities to record and illustrate signs of other red reflex abnormalities for the purposes of documentation, teaching and remote diagnosis. This is especially relevant in the COVID-19 era.



References

- 1 Kousha O, Blaikie A. The Arclight and how to use it. *Community Eye Health*. 2019;32(107):50-51.
- 2 Blundell R, Roberts D, Fioratou E, Abraham C, Msosa J, Chirambo T, Blaikie A. Comparative evaluation of a novel solar powered low-cost ophthalmoscope (Arclight) by eye healthcare workers in Malawi. *BMJ Innov*. 2018 Apr;4(2):98-102.