

The additional role of unmodified iPhone X as a direct ophthalmoscope

Dear Sir,

Smartphone-based image acquisition is increasingly becoming popular in the field of ophthalmology. Higher resolution camera applications have made it possible to acquire high-definition images of the anterior segment, posterior segment, and the periorbital lesions with great ease and at a lesser cost. We have described a few techniques of the anterior segment and optic disc image acquisition using a smartphone-macro lens combination (a small, magnifying lens attachment called the macro lens, no financial interest).^[1,2] The cost of this lens is less than 2USD, and using this lens we were able to acquire high-resolution images. These are very simple techniques that help in a better appreciation of the finer details of the cornea, iris, retina, and the optic nerve head (for retina and the disc 90D lens is additionally used). In addition, we also highlighted the utility of this technique for the quantification of the iris torsion.^[3]

Using an unmodified iPhone X, Gunasekera *et al.* have described on how to capture the images of optic disc.^[4] We also performed an observation using unmodified iPhone X and found that the image qualities obtained by this technique are also of good quality. In addition, the details of the peripapillary area and the macula can also be better appreciated; however, this has been lacking in the previous observation by Gunasekera *et al.* [Fig. 1a and b]. Therefore, this expands the existing knowledge regarding the utility of unmodified iPhone X just to image the optic disc.

As significant ocular pathologies along disc, macula, and the peripapillary area can be documented with greater ease in one frame, the unmodified iPhone X can be helpful in imaging the major posterior pole retinal diseases. Therefore, the resident

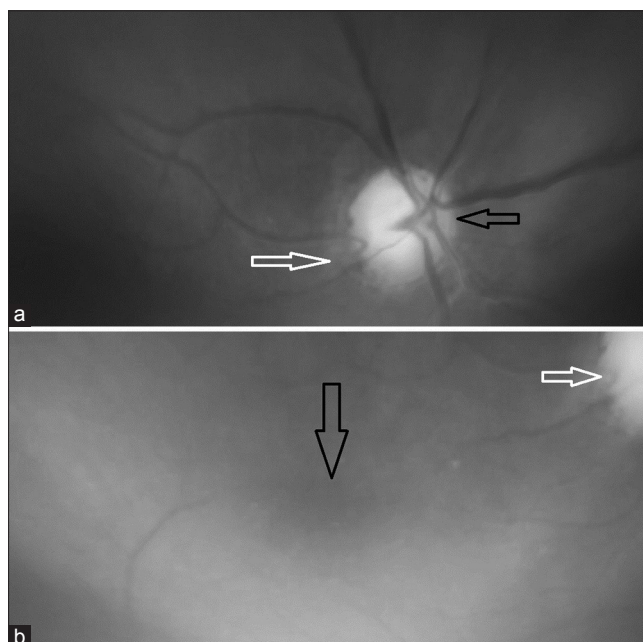


Figure 1: (a) Optic disc (*black arrow*) and the peripapillary area (*white arrow*) can be better appreciated in their entirety. (b) Macula details including dull foveal details (*black arrow*) can be very well appreciated with unmodified iPhone X. Smartphone recorded videos possess better details as compared to the screenshots (standstill images) obtained from them

ophthalmologists and other practitioners can adopt these techniques and further refine them to maximize the utility of smartphone-based imaging technology in ophthalmology. This, in turn, helps in saving precious time in busy clinics to serve the patients better.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

**Amar Pujari, Ashish Markan, Rohan Chawla,
Meghal Gagrani**

Dr. Rajendra Prasad Centre for Ophthalmic Sciences,
All India Institute of Medical Sciences, New Delhi, India

Correspondence to: Dr. Amar Pujari,

Dr. Rajendra Prasad Centre for Ophthalmic Sciences,
All India Institute of Medical Sciences, Room No 212, Second Floor,
RPC-1, New Delhi - 110 029, India.
E-mail: dramarpujari@gmail.com

References

1. Pujari A, Mukhija R, Singh AB, Chawla R, Sharma N, Kumar A. Smartphone-based high definition anterior segment photography. *Indian J Ophthalmol* 2018;66:1375-6.
2. Pujari A, Mukhija R, Chawla R, Phuljhele S, Saxena R, Sharma P. Smartphone-based evaluation of the optic nerve head. *Indian J Ophthalmol* 2018;66:1617-8.
3. Pujari A, Mukhija R, Phuljhele S. Quantification of change in iris torsion using a smartphone. *Ophthalmology* 2018;126:126.
4. Gunasekera CD, Thomas P. High-resolution direct ophthalmoscopy with an unmodified iPhone X. *JAMA Ophthalmol* 2018;29:1-2.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_90_19

Cite this article as: Pujari A, Markan A, Chawla R, Gagrani M. The additional role of unmodified iPhone X as a direct ophthalmoscope. *Indian J Ophthalmol* 2019;67:1253-4.

© 2019 Indian Journal of Ophthalmology | Published by Wolters Kluwer - Medknow