Innovative rapid detection of ocular surface parasitosis in under-resourced facilities

Dear Editor,

Parasitic infection of the eye is a major cause of ocular surface disease globally; the disease spectrum varies with geographical location, local customs and hygiene, living and eating habits, and the types of animals around people. Ophthalmic manifestations of parasites on the ocular surface commonly involve lid edema, redness, watering, itching, foreign body sensation, moving visual shadows, orbit or peri-orbital inflammation and even vision loss.[1] Most parasitic infections are treatable; however, substantial damage by parasites is mostly because of late diagnosis or mis-diagnosis as a result of unfamiliarity with their latent and confusing characteristics. The diagnosis and identification of the parasite are important for appropriate management as late diagnosis and treatment can cause substantial damage.[2] The current mode of image-based diagnosis is by identification of the parasite at the root of the lashes by light microscopy. However, laboratory-based microscopes are costly, time-consuming, labor-intensive, and not always available. We used the intra-ocular lens (IOL) in two innovative forms – anterior segment photography with IOL (ASPI) and an IOL-based microscope (IOLSCOPE) for rapid detection and management of patients suspected with parasitic infestation without the aid of slit lamp and light microscopy.[3,4]

We demonstrated patients with suspected parasitic infestation first with ASPI attached to the smartphone camera which detected the moving or stuck pathogens with the help of photos/videos. The pathogens were then removed with the help of anesthetic eye drops and epilating forceps and placed on a KOH mount. The IOLSCOPE was then aligned on the smartphone camera with a micro-pore. The prepared slide was placed on top of a light source. The smartphone was then brought close to the slide and focused to get the required microscopic image and video from the slide. The microscopic image and video obtained were of good quality and led to the easy detection of the parasite. Appropriate treatment was initiated following diagnosis. Using this technique, we could detect and manage parasitic infestations such as ophthalmomyiasis, demodex, hard tick, Loa loa, and Phthiriasis palpebrabum [Fig. 1]. Hence, this technique is a cost-effective and rapid tool for evaluation and management of ocular parasitosis in setups devoid of slit lamps and light microscopes.

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Conflicts of interest

There are no conflicts of interest.

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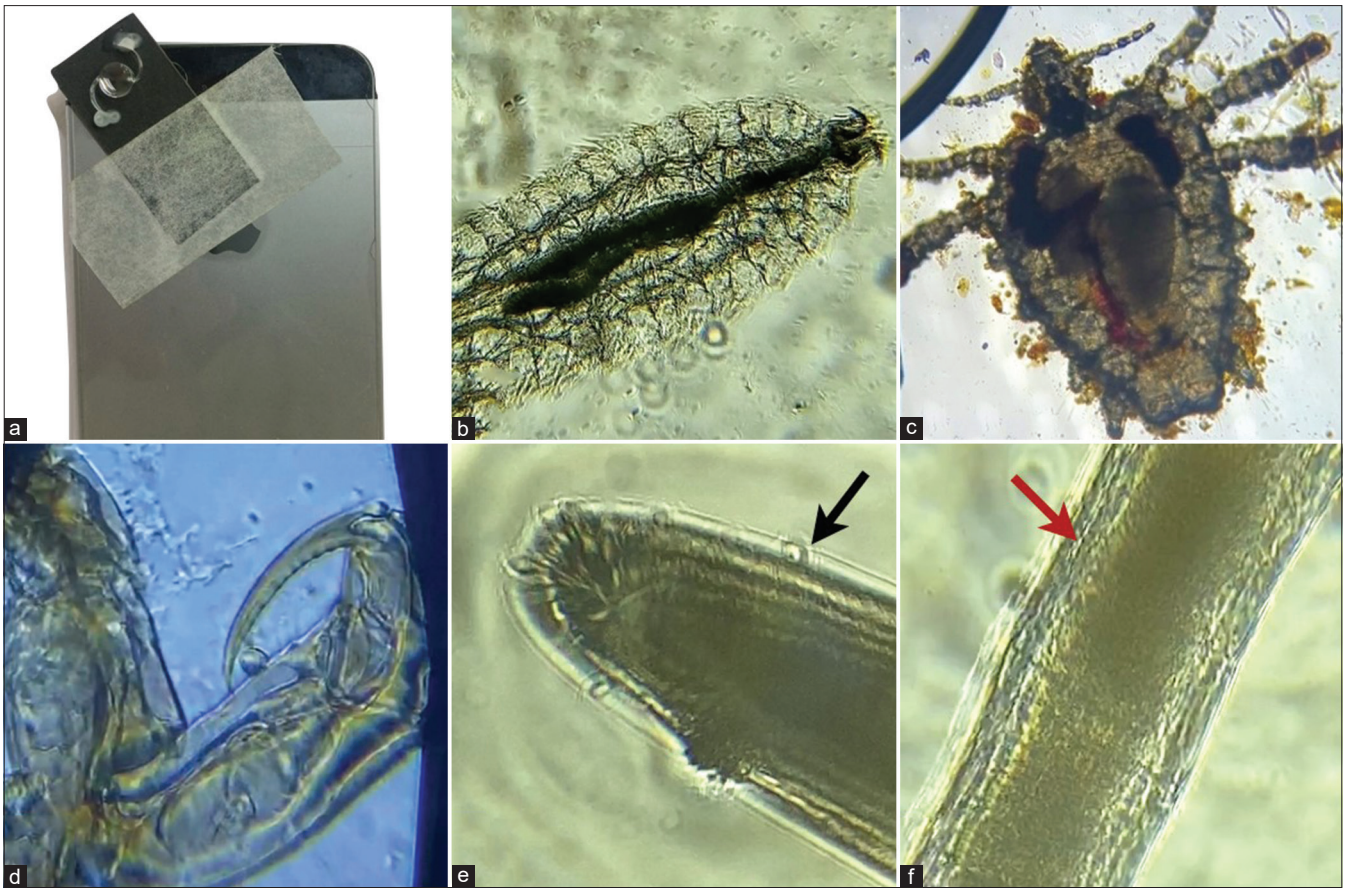

Figure 1: (a) Four 30D IOLs attached to the smartphone camera to form the optical system of IOLSCOPE; microscopic images of parasites obtained using IOLSCOPE, (b) Oestrus ovis larvae; (c) Phthiriasis palpebrarum; (d) Claw-like legs of Phthiriasis palpebrarum; (e) Loa loa microfilariae showing cuticular bosses; (f) Longitudinal cuticular ridges of Loa loa

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