



Detection of Scabies Mites with a Handheld Magnifier and Portable Microscope

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The patient was a 67-year-old man who presented with a worsening maculopapular rash on his body, arms, hands, and thighs. He was hospitalized for two weeks to participate in an inpatient abstinence program for alcohol use disorder. The primary psychiatrist consulted the author (M.K.), who observed several burrows and a “delta-jet-sign”¹ at the tip of the burrows on the patient’s palms using a 10× handheld magnifier (RF-100; Mizar-tech, Tokyo, Japan, Figure 1a). The burrows were scraped and peeled off using adhesive tape, which was then placed on paper and examined using a 120× portable microscope (STV-120M WSA; Kenko, Tokyo, Japan). The original adhesive tape method employs an adhesive tape to directly catch

mites and transfer them to a glass slide.² However, we modified the method because the portable microscope requires a flat surface larger than a standard glass slide. The mites and skin fragments are dispersed on the tape, but we cannot move the portable microscope like the mechanical stage of a traditional microscope to detect mites on the small glass slide. A mite was identified in only one of the samples (Figure 1b), and he had no crusted lesions. Therefore, he was diagnosed with classic scabies, and oral ivermectin was administered. Within three weeks of commencing treatment, his symptoms progressively subsided.

Because of its infectivity and the availability of specific treatments, scabies is a disease that must not be overlooked when examining a rash. Typically, a dermoscope and microscope are required to identify,¹ but these devices are not readily available in resource-limited settings. Worldwide, microscopes are not consistently accessible.^{3,4} In our experience, microscope availability in primary care outpatient clinics in Japan is low. Therefore, we proposed a potential solution for clinicians struggling with a diagnosing scabies. Handheld magnifiers with light-emitting diode lights are not ideal for a precise examination of cutaneous diseases in general. However, they are adequate for checking for burrows and mites signs. The macro lens zoom feature of high-end smartphone models can be an alternative tool for magnification, but we believe its unstable focal length makes its use difficult for skin examination. Similarly, portable microscopes may lack sufficient functionality and magnification power but are adequate for visualizing mites. These two devices are compact and easily available, with prices ranging from \$20 to \$30 USD for each device. Several previous studies have examined portable devices for identifying scabies mite, but these methods necessitate the use of mineral oil or a digital microscope.^{5,6} Despite its relatively low sensitivity,⁷ this method is cost-effective and easy to implement and may aid physicians in diagnosing scabies in resource-limited settings.

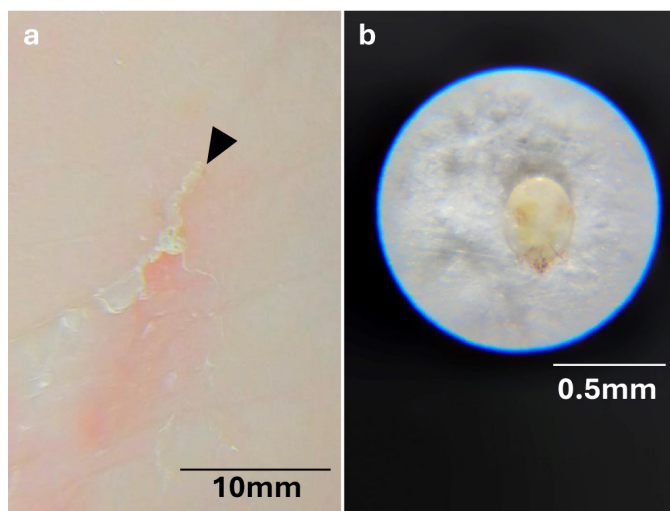


FIG. 1. (a) 10× magnified view of the patient palm using a handheld magnifier. (b) Microscopic view of mites using a portable microscope (120×, light microscope). The image was captured using the smartphone shooting adapter included with the microscope. We offer product names for reference; however, we did not compare any items and do not intend to endorse any specific brand.

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Informed Consent: Written informed consent was obtained from the patient for the publication of this clinical image.

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REFERENCES

1. Bernigaud C, Fischer K, Chosidow O. The Management of Scabies in the 21st Century: Past, Advances and Potentials. *Acta Derm Venereol.* 2020;100:adv00112. [\[CrossRef\]](#)
2. Katsumata K, Katsumata K. Simple method of detecting sarcoptes scabiei var hominis mites among bedridden elderly patients suffering from severe scabies infestation using an adhesive-tape. *Intern Med.* 2006;45:857-859. [\[CrossRef\]](#)
3. Tuan T, Dung VT, Neu I, Dibley MJ. Comparative quality of private and public health services in rural Vietnam. *Health Policy Plan.* 2005;20:319-327. [\[CrossRef\]](#)
4. Chanda P, Castillo-Riquelme M, Masiye F. Cost-effectiveness analysis of the available strategies for diagnosing malaria in outpatient clinics in Zambia. *Cost Eff Resour Alloc.* 2009;7:5. [\[CrossRef\]](#)
5. Flint ND, Simister S, Secrest AM. Usefulness of an Inexpensive, Battery-Powered, Handheld Microscope in Low-Resource Dermatologic Practices. *Indian Dermatol Online J.* 2021;12:645-646. [\[CrossRef\]](#)
6. Miller H, Trujillo-Trujillo J, Feldmeier H. In Situ Diagnosis of Scabies Using a Handheld Digital Microscope in Resource-Poor Settings-A Proof-of-Principle Study in the Amazon Lowland of Colombia. *Trop Med Infect Dis.* 2018;3:116. [\[CrossRef\]](#)
7. Walter B, Heukelbach J, Fengler G, Worth C, Hengge U, Feldmeier H. Comparison of dermoscopy, skin scraping, and the adhesive tape test for the diagnosis of scabies in a resource-poor setting. *Arch Dermatol.* 2011;147:468-473. [\[CrossRef\]](#)