

The Burrow Ink Test: a Simple Method to Improve the Diagnosis of Scabies



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A 25-year-old woman presented with generalized pruritus not responsive to antihistamines and topical steroids. Examination showed excoriated papules on the limbs and a whitish scale between the toes. Dermatoscopy revealed the typical “triangle sign,” which corresponds to the anterior mite (Fig. 1a). A burrow ink test (BIT) was positive and showed a classic S-shaped burrow (Fig. 1b). Dermatoscopy of BIT showed the *Sarcoptes scabiei*'s eggs (Fig. 1c). The patient and contacts were successfully treated with topical permethrin cream.

The BIT is a simple test to diagnose scabies. It is performed by rubbing a suspected burrow with ink from a marking pen. Excess ink is wiped off with an alcohol swab. If a mite burrow

is present, the ink will fill the burrow in the stratum corneum, where the mite has tunneled, revealing the characteristic S-shaped burrow¹.

The gold standard diagnostic test remains biopsy. In one study comparing the BIT to shave biopsy ($n = 55$), 36% of BIT-negative lesions had confirmed scabies-positive infections by biopsy².

Due to the paucity of mites in many cases, a negative BIT does not rule out infection. However, the BIT should be considered a non-invasive, inexpensive, easy-to-perform test for scabies diagnosis, not requiring special equipment or training.³



Figure 1 Panel a Classic dermatoscopy image of “triangle sign”, which corresponds to the anterior part of the mite (black arrows). Magnification $\times 10$. Panel b Burrow ink test: staining of the same lesion with washable blue ink. Without magnification, a clear outline and classic S-shaped burrow. Panel c Polarized dermatoscopy ($\times 10$) after ink staining. The “mother” mite is visible to the extreme side of the burrow (black arrow). Also, many eggs are evident (short red arrows).

This study was conducted at the Department of Dermatology, Escuela de Medicina, Pontificia Universidad Católica de Chile.

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2. **Woodley D, Saurat JH.** The burrow ink test and the scabies mite. J Am Acad Dermatol 1981;4:715–22
3. **Leung V, Miller M.** Detection of scabies: A systematic review of diagnostic methods. Can J Infect Dis Med Microbiol 2011;22(4):143-146. <https://doi.org/10.1155/2011/698494>

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REFERENCES

1. **Engelman D, Yoshizumi J, Hay RJ, et al.** The 2020 International Alliance for the Control of Scabies Consensus Criteria for the Diagnosis of Scabies