Bead retention test in koilonychia

Problem

Koilonychia is an important clinical clue to the associated dermatoses such as psoriasis, lichen planus, alopecia areata, onychomycosis, genodermatoses, iron deficiency anemia, hypothyroidism, hyperthyroidism, diabetes mellitus and repeated occupational trauma. Unlike pitting and pterygium, koilonychia is difficult to diagnose on visual examination. Complex mathematics is required to measure nail convexity; thus, taking measurements is not practical or feasible in the clinical setting. Water-drop test is a classically described clinical test to diagnose koilonychia.[1] In this test, a few water drops are poured over the nail plate using a 1 ml syringe. In koilonychia, these droplets pool over the concave nail plates, unlike the normal convex nail plates. However, nails are highly hydrophilic.[2] Water droplets even attach to vertically placed windowpanes because of the adhesive properties of water.[3] It will be difficult to interpret whether pooling of water droplets on the hydrophilic nail plates in the water-drop test is due to this adhesive property of water or due to pooling of water on concave nail plates of koilonychia. Accordingly, sometimes, we observe false-positive water-drop test in individuals with normal smooth convex nail plates [Figure 1a and b].

Solution

We use easily available spherical plastic beads to rule out koilonychia. Unlike water droplets which may stick to the nail plate, these beads easily roll down from the normal

Figure 1a: False-positive water-drop test. Normal convex nail plates with smooth surfaces

Figure 1b: False-positive water-drop test. After applying a few drops of water on the nail plates using 1 ml syringe. Water droplets could be seen adhered to the nail plates giving a false-positive water-drop test

Figure 2a: Bead retention test. Koilonychia in a patient of iron deficiency anemia

Figure 2b: Bead retention test. Spherical plastic beads are placed on the spoon-shaped nail plates. Beads got retained on these nail plates without rolling down, giving a rapid and easily interpretable visual impression of koilonychia

Figure 3a: The technique to facilitate bead retention test in clinically inapparent koilonychia. Place the palmar aspects of hands on a rigid flat surface

Figure 3b: The technique to facilitate bead retention test in clinically inapparent koilonychia. This will avoid the frequent rolling down of the plastic beads due to the undue hand movements and will help to document koilonychia even at its early stages

convex nails. But, nail plates of koilonychia retain these beads on their concave surface. To demonstrate this, we placed spherical plastic beads on the nail plates of an iron deficiency anemia patient with associated koilonychia. The beads were retained on the nail plates and did not roll down [Figure 2a and b]. Placing the patient's hands on a rigid, flat surface helps to counter undue hand movements. This circumvents the technical difficulty in retaining the beads on the nail surface, particularly in the setting of a clinically inapparent koilonychia [Figure 3a and b].

This simple test not only circumvents the false-positive interpretation regarding koilonychia but also gives an excellent visual impression to both clinicians and patients. We have demonstrated this test further in five koilonychia patients (5/5 tested positive) and five controls with normal convex nails (5/5 tested negative). Even though we did not find any false-positive or false-negative test results with this novel test, further studies are needed to validate this test in koilonychia.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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