An effective, low-cost technique for photograph and video capture, wireless transmission, and quality assurance assessments for dermatopathology, anatomic pathology, and Mohs micrographic surgery

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CLINICAL CHALLENGE

Dermatopathology, like clinical dermatology, is dependent on effective teaching, mentoring, and quality assurance steps. The advent of digital cameras has allowed dermatologists to easily share clinical images around the world, but expanding this technology to histopathology has been fraught with logistical challenges. Using a standard binocular microscope precludes the ability of the dermatopathologist to easily share live or stored images of glass slides, while privacy considerations and the irreplaceability of slides limit the ability to share original material for quality assurance purposes, and multiheaded microscopes with specialized video camera arrays cost many thousands of dollars.

SOLUTION

Using a commercially available plastic binocular adapter for a smartphone (Snapzoom Universal Digiscoping Adapter, HI Resolution Enterprises, Honolulu, HI), an iPhone (Apple Inc, Cupertino, CA) is securely fixed to the eyepiece of a standard single-head binocular microscope. After adjustment, opening the Camera application will show the view of the glass slide directly on the smartphone screen.

Using the AirPlay feature, included standard on all iPhones, all content visible on the handset can be automatically mirrored wirelessly to any television or projector attached to an Apple TV unit (Apple Inc) linked to the same wireless network. Internet access is not required, so that even in resource-strapped environments, an inexpensive wireless router can be used.

Alternatively, video chat may be used if Internet access is present, and images can be captured directly and shared as well. In addition, simply using the digiscoping adapter and a smartphone, still images or videos may be recorded directly onto the smartphone and sent electronically to a colleague without using the Apple TV unit.

One previous report addressed the use of a commercial binocular adapter for dermatopathology instruction,[1] although it relied on a wired system consisting of an Lightning Digital Adapter (Apple Inc) coupled with a high-definition multimedia interface cable connected to a projector. This wired system does not result in a significant cost savings, however, and makes connection to a distant television monitor more challenging, which may require the purchase of a specialized cable or standalone projector.

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Using off-the-shelf equipment, any microscope can be converted to a wireless teaching or quality assurance laboratory for less than $150, with image quality rivaling that seen with systems previously only available to large institutions.

REFERENCE

1. Streicher JL, Kini SP, Stoff BK. Innovative dermatopathology teaching in a resource-limited environment. *J Am Acad Dermatol*. 2016;74:1024-1025.