A fast and effective option for tissue flattening: Optimizing time and efficacy in ex vivo confocal microscopy

Javiera Pérez-Anker, MD, MSc, Susana Puig, MD, PhD, and Josep Malvehy, MD, PhD
Barcelona, Spain

Key words: digital stain; ex vivo confocal microscopy; Mohs microscopic surgery; optimizing time; skin cancer surgery; tissue flattening device.

TECHNOLOGY CHALLENGE

Ex vivo confocal microscopy has opened the door to rapid, intraoperative diagnosis of tissue specimens. However, to avoid false-negative diagnosis, it is critical to optically visualize the whole specimen. To achieve that, the tissue specimen should be in full contact with the glass slide. Because of variability in sample density and constitution, perfect flattening is a real challenge.[1]

Several devices have been developed to achieve this aim; for example, compression of the specimen between 2 glass slides attached together with silicon glue or modeling clay has been suggested.[2] However, both techniques are time consuming and only partially effective.

THE SOLUTION

To meet this challenge, we have developed a system of magnets of different sizes and strengths attached to the slide and the cover (Fig 1). The first step is to remove all air bubbles from the sample and slide. A sponge is then placed on the sample and the cover. The slide and cover are then secured together by the magnets, which are glued to both slide and cover. The sponges and magnets vary to fit different samples. With thicker samples, thicker and denser sponges are required, and stronger magnets are needed to ensure stability. The technique of correct flattening and scanning is shown in the explanatory Video 1.

In case of thick specimens, the epidermis and dermis can also be separated from the fat with a surgical scalpel. In summary, we describe a novel tissue-flattening device that enhances optical scanning of the entire surgical specimen.

From the Melanoma Unit, Dermatology Department, Hospital Clínic de Barcelona, Institut d'investigacions Biomèdiques August Pi i Sunyer, Universitat de Barcelona.
Funding sources: None.
Conflicts of interest: This device is protected with the patent number 10 2019 101 035.7, January, 16, 2019.
Reprint requests: Javiera Pérez-Anker, MD, MSc, Dermatology Department, Hospital Clínic—IDIBAPS, University of Barcelona, Carrer de Villarroel, 170, 08036 Barcelona, Spain. E-mail: javiperezanker@gmail.com, perez12@clinic.cat.
J Am Acad Dermatol 2020;82:e157-8.
0190-9622/$36.00

https://doi.org/10.1016/j.jaad.2019.06.041

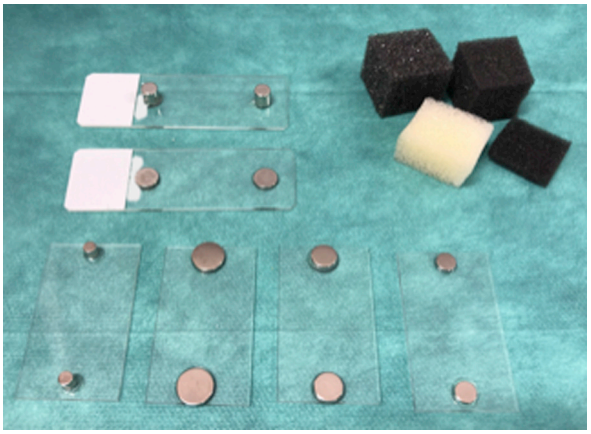

Fig 1. Magnets of different sizes and strength. Sponges of different sizes and densities.

REFERENCES

1. Pérez-Anker J, Malvehy J, Moreno-Ramírez D. Microscopia confocal ex vivo con método de fusión y tinción digital: cambiando paradigmas en el diagnóstico histológico. *Actas Dermosifiliogr*. In press.
2. Cinotti E, Grivet D, Labeille B, et al. The 'tissue press': a new device to flatten fresh tissue during ex vivo confocal microscopy examination. *Skin Res Technol*. 2017;23(1):121-124.