

What are the key sonographic signs in hidradenitis suppurativa?

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Background

Hidradenitis suppurativa (HS) is a chronic, inflammatory disease of the hair follicle that results in the formation of recurrent lesions in the intertriginous areas.¹

Recently, new sonographic signs related to disease severity have been described thanks to the emergence of the ultra-high frequency ultrasound (UHFUS), which allows the detection of lesions up to 0.05 mm with higher image quality and more detailed analysis of visible structures than with previous ultrasound devices.²⁻³ The sonographic correlates of abscesses and fistulas have been previously described.⁴ Conversely, **nodules**, **tombstone comedones**, and **HS-related scars** have been less precisely defined from a sonographic point of view.

Our objective was to identify the key ultrasonographic signs of nodules, tombstone comedones, and scars in HS.

Materials and methods

We retrospectively evaluated sonographic images and videos realised with UHFUS on 72 HS patients who attended the Department of Dermatology, Hôpital Erasme, ULB, Brussels.

The UHFUS device used was the Vevo[®]MD (VisualSonics) which features three probes at different frequency (22 MHz, 48 MHz, 70 MHz).

Results

The following UHFUS findings were detected:

- **Nodule** – It can be ultrasonographically characterized by the presence of *epidermal cysts* (Fig. 1), *pseudocysts* (Fig. 2) or *widened hair follicles* (Fig. 3), each containing hair tracts.
- **Tombstone comedo** – The key ultrasonographic sign commonly found in this lesion is the *bridge sign* (Fig. 4).
- **HS-related scar** – Two types of scars exist : the *cribriform scar* and the *cord*. Both of them can be characterized by the presence of *micro-tunnels* (Fig. 5).

Clinical-sonographic Correlation

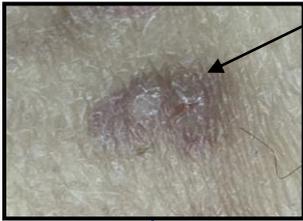


Figure 1. 48 MHz. Epidermal cyst containing numerous hair tracts.

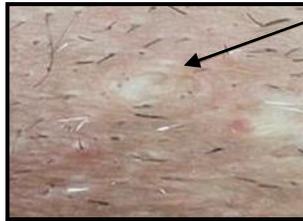


Figure 2. 70 MHz. Pseudocyst containing a widened, "balloon-shaped" hair follicle which displays the so-called "donor sign" (ie, dilated hair follicle that may be a potential donor of keratin and protrudes into a pseudocyst, fluid collection, or tunnel).

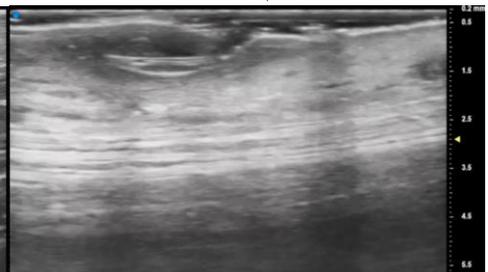


Figure 3. 70 MHz. Widened hair follicle containing a bilaminar hair tract.

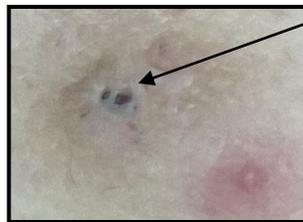


Figure 4. 70 MHz. The "bridge sign", which is a hypochoic band that connected the base of 2 or more dilated hair follicles, is often found in tombstone comedos.

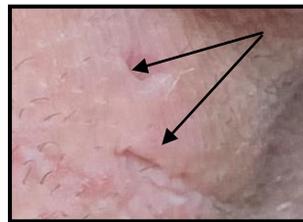
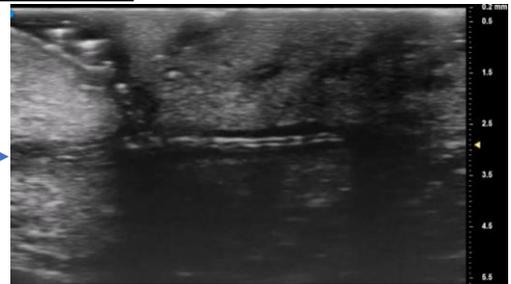
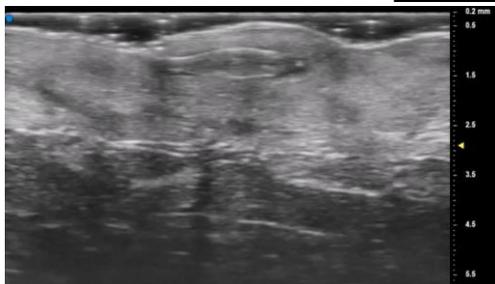


Figure 5. 70 MHz. A micro-tunnel, which is a sub-type of tunnel characterized (ie, a small transversal diameter (<2 mm) with a triple connection to the epidermis).



Conclusion

Clinically similar lesions can be characterized by different ultrasonographic signs and therefore potentially related to different physiopathological mechanisms. The use of UHFUS may help better understanding the physiopathology of HS, as well as enhance early detection and severity assessment of the disease.

1. Daxhelet M et al. Proposed Definitions of Typical Lesions in Hidradenitis Suppurativa. *Dermatology*. 2020;236(5):431-8.

2. Wortsman X et al. Seventy-MHz Ultrasound Detection of Early Signs Linked to the Severity, Patterns of Keratin Fragmentation, and Mechanisms of Generation of Collections and Tunnels in Hidradenitis Suppurativa. *Journal of Ultrasound in Medicine*. 2020;39(5):845-57.

3. Oranges T et al. Advanced evaluation of hidradenitis suppurativa with ultra-high frequency ultrasound: a promising tool for the diagnosis and monitoring of disease progression. *Skin Res Technol*. 2019.

4. Martorelli A, Giovanardi G, Gomez-Palencia P, Sanz-Motilva V. Defining Fistular Patterns in Hidradenitis Suppurativa: Impact on the Management. *Dermatol Surg*. 2019 Oct;45(10):1237-1244.