ROL DE LA ECOGRAFÍA DOPPLER COLOR EN EL DIAGNÓSTICO Y ESTADIAJE DE HIDROSADEADENITIS SUPURATIVA

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Keratina
Colageno
Tejido Adiposo

PIEL

2D escala de grises, eje transverso – antebrazo dorsal

Normal Skin

Non Glabrous Skin
i.e. out of the palms and soles)

2D grey scale ultrasound and 3D reconstruction
( transverse view, ventral forearm)

Glabrous skin
(i.e palms and soles)

3D reconstruction
(transverse view, plantar region)

PICTORIAL REVIEW

Sonography in pathologies of scalp and hair

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ABSTRACT. Disorders of the scalp often result in severe cosmetic interference with quality of life, creating the need for optimal medical surveillance. We tested the latest generation of ultrasound machines in patients with scalp pathology and prepared a

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Foliculos Pilosos

Hair Follicles
Patrones Normales del Tracto Piloso

(region frontal region)

Estructura Hiperecogénica Trilaminar

80%

Estructura Hiperecogénica Bilaminar

20%

Keratina


“Dar informacion complementaria y util a la ya obtenida visualmente por el clinico”

Wortsman X, Jemec G. Advances in psoriasis and inflammatory skin diseases 2010; vol 2; issue 1: 9-15
Ventajas US

- Buen balance Resolucion /Penetracion (0.1-60 mm)
- Tiempo Real
- Morfología y cuantificación del flujo sanguíneo
- No irradia ni confina al paciente a un espacio reducido
- Sin efectos secundarios de contraste endovenoso

Lesiones de menor espesor que 0.1 mm

Solo epidermicas

No distingue pigmentos

Objetivos

Apoyar al clínico en:

- Detección/Diagnóstico
- Actividad
- Severidad

Wortsman X, Jemec GBE. Advances in psoriasis and inflammatory skin diseases 2010;2;1: 9-15
Equipos: Multicanales con transductores de frecuencia variable (7-22 MHz). Ideal ≥ 15 MHz.

Operador entrenado

Sedación en niños < 4 años (Hidrato de Cloral 50 mg/Kg peso/ Melatonina según edad)

Wortsman X. Ultrasound in Dermatology: Why, How and When? Seminars in Ultrasound CT and MRI 2013; 34:177-195
Objectives—To support standardization for performing dermatologic ultrasound examinations.

Methods—An international working group, called DERMUS (Dermatologic Ultrasound), was formed, composed of physicians who have been working on a regular basis and publishing in peer-reviewed articles on dermatologic ultrasound. A questionnaire on 5 critical issues about performance of the examinations was prepared and distributed by e-mail. The areas of discussion included technical aspects, main areas of application, minimum number of examinations per year required for assessing competence, qualifications of the personnel in charge of the examination, and organization of courses. Final recommendations were approved on the basis of the agreement of more than 50% of the members.

Results—The minimum frequency recommended for performing dermatologic examinations was 15 MHz. Routine use of color Doppler ultrasound and the performance of spectral curve analysis for assessing the main vascularity of lesions were suggested. Three-dimensional reconstructions were considered optional. The main dermatologic applications were benign tumors, skin cancer, vascular anomalies, cosmetic field, nail disorders, and inflammatory diseases. The minimum number of examinations per year suggested by the group for assessing competence was 300. A physician and not a sono-
Clinical usefulness of variable-frequency ultrasound in localized lesions of the skin

Ximena Wortsman, MD, and Jacobo Wortsman, MD
Santiago, Chile, and Springfield, Illinois

Background: High variable-frequency ultrasound is a recently available technique capable of clearly defining skin layers and deeper structures that also provides local perfusion patterns obtained in real time.

Objectives: The aim of the study was to assess the performance of variable-frequency ultrasound in the evaluation of skin lesions.

Methods: We performed a retrospective study of 4338 skin ultrasound examinations in predominantly localized skin lesions, and in a group of 130 healthy controls. We determined ultrasound sensitivity, specificity, and statistical level of certainty, and compared ultrasound diagnoses with clinical diagnoses.

Results: Referring diagnosis was correct in 73% of the lesions, and addition of ultrasound increased correctness to 97% ($P < .001$ for the difference). Ultrasound overall sensitivity was 99%, specificity was 100%, and statistical diagnostic certainty was 99%.

Limitations: Ultrasound in its current version cannot detect lesions that are epidermal only or that measure less than 0.1 mm in depth.

Conclusions: Ultrasound is a reliable adjuvant for the accurate and precise diagnosis of skin lesions. (J Am Acad Dermatol 2010;62:247-56.)

Key words: dermatology; imaging; skin; sonography; tumors; ultrasound.
Sensibilidad  Clin 73%  US 97%
Falsos Positivos 0%
Falsos Negativos < 1%

62 publications included in the review, 4 studies met criteria to be assigned the highest grade for quality of evidence.

“Most therapies used to treat HS were supported by limited or weak scientific evidence”.

Ultrasound Examination of Hair Follicles in Hidradenitis Suppurativa.

Figure 1. Ultrasound image of normal axillary skin. Asterisks indicate epidermal echo; arrows, hair follicles; D, dermis; and S, subcutis.

Figure 2. Ultrasound image of paralesional skin in a patient with hidradenitis suppurativa. The diameter of the deep follicle (arrow) is increased.

Real-Time Compound Imaging Ultrasound of Hidradenitis Suppurativa

Ximena Wortsman, MD,* and Gregor B. E. Jemec, MD, DMSc†

BACKGROUND Hidradenitis suppurativa (HS) is a difficult disease to treat. Surgery may be curative, but just like cancer surgery, it must be complete to effect a cure. Preoperative imaging of hidradenitis lesions is therefore of interest.

OBJECTIVE The objective was to study the ultrasound characteristics of hidradenitis and compare these to the clinical findings.

MATERIALS AND METHODS Real-time compound imaging ultrasound systems were used (Philips HDI 5000 and IU22) to visualize HS lesions in seven patients and regional controls images from eight healthy volunteers.

RESULTS Hidradenitis-related features were identified: various fluid collections, increased dermal thickness (mean ± SD, 3.3 ± 1.0 mm vs. 1.4 ± 0.3 mm for controls) and lower echogenicity of the skin. In comparison with clinical examination, we were able to identify both subclinical lesions and subclinical extension of lesions into clinically normal looking paralesional skin. Hair follicles appeared distended.

CONCLUSION A number of HS features can be identified by ultrasound. These features include both actual lesions and possible predisposing factors such as skin thickness and hair follicle morphology. Ultrasonography can identify the true extent of lesions in HS, which may be of use in the preoperative planning.

Ximena Wortsman, MD, and Gregor B. E. Jemec, MD, DMSc, have indicated no significant interest with commercial supporters.

H idradenitis suppurativa (HS) is often a difficult disease to treat. Early or mild lesions may, however, respond to medical treatment. Three treatments have been described as potentially effective in small randomized controlled trials: topical clindamycin, tetracycline, and estrogens.1−3 Often a number of other drugs are used off-label, however, in poorly controlled cases of hidradenitis, surgery is necessary. In either case it is of benefit to the surgeon to establish an accurate estimate of the size of the lesions before embarking on the operation. The use of ultrasound may therefore be of benefit to the preoperative assessment of patients with HS if lesions can be visualized.

Materials and Methods

n=7

- Colecciones líquidas
- Aumento del espesor dermico (mean+/−SD, 3.3+/−1.0 mm vs. 1.4+/−0.3 mm for controls)
- Disminución de la ecogenicidad dérmica
- Ensanchamiento de folículos pilosos
Cambios Ecogenicidad Dermis

Agrandamiento Emergencia Foliculos Pilosos

Key points

- Hidradenitis lesions extend into the deeper tissue
- Imaging may facilitate the assessment of disease severity and treatment
- Imaging may aid differential diagnosis

axillae, the ano-genital region or under the breasts, they may penetrate far from the skin, and may reach distant sites. If this is not properly identified before treatment the presence of such lesions may adversely affect the outcome of, for example, surgery. Similarly, appropriate visualization of the extent of all lesions may help in the planning of surgery; finally, non-invasive visualization of lesions may be used to monitor the effect of, for example, medical therapy.
198 linfonodos en 10 pacientes HS (6 Hurley II y 4 Hurley III) y 101 linfonodos de controles sanos

HS: Mantienen forma y tamaño en estadios HS I y II sin diferencias significativas en tamaño o morfología

Hurley III linfonodos aumentan levemente de tamaño (1.3 +/- 0.4 cm, p = 0.03) lo que impresiona ser secundario a infección y no a la enfermedad primaria y se mantiene la morfología en su ecoestructura
Ultrasound aids in diagnosis and severity assessment of hidradenitis suppurativa.

Kelekis, N; Efstathopoulos, E; Balanika, A; Spyridopoulos, T; Pelekanou, A; Kanni, T; Savva, A; Brountzos, E; Giamarellos-Bourboulis, E British Journal of Dermatology. 162(6):1400-1402, June 2010.

N=19
91 sitios afectados

Echo score (grosor epidermis-dermis)
5 Hurley stage I = 11.60 ± 6.43;
5 Hurley stage II = 17.40 ± 7.44
9 Hurley stage III = 41.00 ± 26.62
(P = 0.018 vs. stage I; P = 0.045 vs. stage II).

Engrosamiento dermico

Fig 2. (a) Right axilla of a 38-year-old female patient. Ultrasound (US) findings of one of the lesions: (b) sagittal US image showing a hypoechoic dermal lesion with dermal-hypodermal rupture; (c) sagittal US image showing vascularity at the periphery of the lesion; and (d) spectrum analysis showing low resistance arterial flow (resistance index = 0.44) at the lesion's periphery.
Ultrasonido podría ayudar a establecer diagnóstico y severidad.
A 3D Ultrasound Study of Sinus Tract Formation in Hidradenitis Suppurativa

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A 3D Ultrasound Study of Sinus Tract Formation in Hidradenitis Suppurativa

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Abstract

Imaging of hidradenitis suppurativa allows the study of both the lesion morphology and evolution. Hidradenitis lesions of different stages were studied using 3D ultrasound in a cross-sectional pilot study. A total of 25 HS patients (18 female/7 male, aged 18–46 year-old) and 10 healthy controls (5 female/5 male, aged 21–49 year-old) were studied. All patients were referred by dermatologists. All examinations were performed on the right axilla and compared with both controls and the skin outside the lesional areas.

3D ultrasound images demonstrated enlargement of the deepest portion of the hair follicles in early stages. In more advanced stages dermal and subcutaneous sinus tracts were identified that were commonly connected to the base of the regional hair follicles. At the end stage of the disease, these sinus tracts were further dilated and multiple.

Ultrasound allows early detection and characterization of the morphological changes in hidradenitis, which include the variable degrees of involvement of the hair follicles and the appearance of fluid collections and sinus tracts. Knowledge of this anatomical information may allow the identification of lesions that can benefit from medical or surgical management.

Anatomía Normal 3D de la piel

Hurley I
Cambios tempranos
Foliculos Pilosos

Hurley II
Ensanchamiento Foliculos Pilosos
Fistula

Hurley III
Colección comunicada a base foliculos pilosos ensanchados

Ultrasound In-Depth Characterization and Staging of Hidradenitis Suppurativa

Ximena Wortsman, MD, Claudia Moreno, MD, Rosary Soto, MD, Javier Arellano, MD, Carlo Pezo, MD, and Jacobo Wortsman, MD

BACKGROUND: The clinical diagnosis of fistulous tracts and recurrent fluid collections in hidradenitis suppurativa (HS) may be complex. Information on subclinical involvement and grading of severity may improve management.

OBJECTIVE: To study HS lesions and evaluate the relevance of adding ultrasound (US) to the clinical examination.

METHODS AND MATERIALS: We reviewed the sonograms of consecutive patients with HS from January 1, 2010 to May 31, 2012. The abnormalities observed in the US examinations were organized, classified, and integrated into a clinical-sonographic scoring system (SOS-HS), to stage the disease.

RESULTS: Thirty-four patients with HS with a total of 142 lesioned areas were evaluated. US findings included subclinical fluid collections in 76.4% of the patients, fistulous tracts in 29.4%, dermal pseudocysts in 70.6%, and widening of the hair follicles in 100%. Concordance with the clinical HS scoring performed by dermatologists showed a significant fair agreement (κ = 0.50; p < .001); concordance of SOS-HS with clinical scores was acceptable but significantly lower (κ = 0.27; p = .02) because clinical scores consistently underestimated disease stage and severity.

CONCLUSION: US examination of HS lesions provides anatomic information that is clinically unavailable. HS is possible to stage sonographically.

The authors have indicated no significant interest with commercial supporters.

Hidradenitis suppurativa (HS), also called acne inversa, is a chronic recurrent inflammatory disease that affects the skin-bearing terminal hair follicles and apocrine glands. Clinically, HS is findings and is easy to perform but provides insufficient detail on severity to be useful for application in clinical trials. Another classification, by Sartorius, incorporates four valuable factors: anatomic region...
Antecedentes

-Hasta la fecha el diagnóstico y el estadiaje de hidrosadenitis supurativa (HS) estaba basado en criterios clínicos

-El diagnóstico clínico de fístulas y colecciones líquidas en HS puede ser complejo

-El manejo de HS puede ser difícil

-La presencia de fístulas y colecciones líquidas puede implicar una modificación en el manejo

Objetivo

- Estudiar por ecotomografía Doppler color (EDC) las lesiones de HS y evaluar la relevancia de adicionar ultrasonido (US) al examen clínico.

Material y Método

- Estudio retrospectivo de los examenes de ECD (Enero 2010- Mayo 2012) con diagnostico clinico (dermatologo) y ultrasonografico de HS

- Para scoring clinico: pacientes fueron clasificados clinicamente por 3 miembros del Departamento de Dermatologia a través de teleimagenes y clasificacion de Hurley

- El mismo radiologo realizó todos los examenes de US, diseñó reporte y scoring sonografico (SOS-HS) para establecer severidad

- El análisis de scoring fue ciego entre los dermatologos y el radiologo

- Test de Kappa para evaluar concordancia entre los clinicos (95% intervalo de confianza)

Criterios Ultrasonograficos Diagnosticos de HS

Presencia de ≥ 3 criterios de tabla 3

# SOS-HS Staging of Severity

## Table 2. Sonographic Scoring of Hidradenitis Suppurativa (SOS-HS)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Single fluid collection and dermal changes (hypoechoic or anechoic pseudocystic nodules, widening of the hair follicles, alterations in the dermal thickness or echogenicity) affecting a single body segment (e.g., axilla, groin, breast, buttock) (uni- or bilateral) without fistuluous tracts</td>
</tr>
<tr>
<td>II</td>
<td>Two to four fluid collections or a single fistulous tract with dermal changes affecting up to two body segments (uni- or bilateral)</td>
</tr>
<tr>
<td>III</td>
<td>Five or more fluid collections or two or more fistulous tracts with dermal changes or involvement of three or more body segments (uni- or bilateral)</td>
</tr>
</tbody>
</table>
Resultados

- 34 pacientes con criterios clínicos y ultrasonográficos de HS, 80% F/ 20% M, edad promedio 26.7 ± 10 años.

- 142 zonas lesionales

US Compromiso:
- 65% solo axilar
- 9% solo inguinal
- 17% axilar e inguinal
- 9% otras (inframx, retroauric, txca; 3% c/u)

Trayecto Fistuloso Inguinal
SOS HS III

Abreviaciones y Simbolos:
*, tracto que conecta a la zona subepidermica

Resultados

Por US el compromiso multiregional (≥ 2 segmentos corporales en 27% casos)

Promedio: 1,3 segmentos corporales comprometidos por paciente

Resultados

- Lesiones Subclínicas:
  - Colecciones líquidas 76%
  - Tractos fistulosos 29%
  - Pseudoquistos dérmicos 71%

Colecciones Liquidadas Subclínicas

- Extension: 0,6-5,3 cm transv; 0,1-0,9 cm esp y 0,2-7 cm long
- 38% 2-4 colecciones
- 35% 1 colección
- 8,8% ≥ 5 colecciones

Colecciones comunicadas a bases foliculos pilosos

Fistulas Subclínicas

- Presentes en el 29% de los pacientes
- Extension:
  - 1,7-12,2 cm en eje mayor
  - 0,02-1,1 cm espesor
- Dermis y subcutáneo superficial
- Comunicadas a las bases de los foliculos pilosos

Resultados

- Concordancia entre clínicos fue significativamente aceptable (k: 0.30; p < 0.001).
- Concordancia entre clínica y SOS-HS fue aceptable pero menor (k=0.27; p=0.02)

Scores clínicos subestimaron la severidad sonográfica

Confirma la existencia de lesiones subclínicas en HS
Puede ayudar al diagnóstico y modificar el manejo clínico de HS en forma más temprana (cambio manejo clínico-quirúrgico o cambios en el manejo clínico)

82% cambió el manejo clínico
24% cambió manejo médico a quirúrgico

Ecografía de la hidradenitis supurativa

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PALABRAS CLAVE
Ecografía cutánea; Ultrasonido; Hidradenitis supurativa; Hidrosadenitis supurativa; Acné inversa

Resumen La hidradenitis supurativa es una enfermedad cutánea crónica, inflamatoria, recurrente y debilitante del foliculo piloso, que se presenta habitualmente con lesiones dolorosas, profundas e inflamadas en las áreas del cuerpo que albergan glándulas apocrinas, y son más frecuentes en las regiones axilares, inguinales y anogenitales. Se trata de una entidad de difícil manejo, ya que, en muchas ocasiones, es complicado precisar la verdadera naturaleza y la extensión de las lesiones. La ecografía cutánea permite una visualización en tiempo real de las estructuras cutáneas en estudio que define el tipo de lesión, su extensión anatómica y el grado de actividad inflamatoria, lo que repercutirá en el manejo adecuado del paciente. En la presente revisión analizamos la relevancia de la ecografía en la valoración del paciente con hidradenitis supurativa.

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KEYWORDS
Ultrasound examination of hidradenitis supurativa

n=12 (≤ 15 años)
Pseudoquistes 92%
Colecciones Liquidas 83%
Fistulas 58%
SOS-HS II 67%

En niños la ecografía cambió el manejo en 95%

Histología limitada por el extenso compromiso transregional

Otros métodos de imágenes son limitados
- CFM/ OCT penetración muy baja (≤ 2 mm)
- MRI/CT resolución baja en piel
Clave: Pelo

Proceso autoinmune/inflamatorio relacionado con la síntesis del pelo

Ensanchamiento (inflamación) de los folículos pilosos a nivel de su base

Fragmentos de pelos secuestrados y que no pueden ser removidos volviéndose irritantes locales y agentes pro inflamatorios crónicos

50 pacientes HS Julio – Diciembre 2014 (32 F/18 H; edad promedio: 31 años (SD 12.3; rango: 7-54 años).

80% demostró fragmentos de pelos ectópicos dentro de las colecciones y fistulas a través de la dermis e hipodermis corriendo en forma paralela a la piel.

Largo promedio de los fragmentos de pelos: 4.4 mm, con una amplia dispersión (SD 6.9; range: 2-31.7 mm).

Imaging of Hidradenitis Suppurativa

Ximena Wortsman, MD*

KEYWORDS
- Hidradenitis suppurativa • Hidradenitis suppurativa ultrasound • Hidradenitis imaging
- Hidradenitis MRI • Hidradenitis suppurativa color Doppler ultrasound
- Hidradenitis suppurativa sonography • Skin ultrasound • Dermatologic ultrasound
- Inflammation ultrasound • Hidradenitis staging

KEY POINTS
- Clinical examination alone can underestimate the severity of HS.
- Color Doppler ultrasound may support the management of hidradenitis suppurativa.
- Sonographic criteria for supporting the diagnosis are established.
- Disease staging is possible using ultrasound.
- MRI can help in the diagnosis of extensive and deep anogenital lesions.

Videos of Power Doppler and gray scale ultrasound accompany this article at http://www.derm.theclinics.com/

INTRODUCTION
Hidradenitis suppurativa (HS) is a complex disease of difficult management. The actual origin of the disease remains unclear. Moreover, according to a review by Rambhatla and colleagues, most therapeutic approaches, such as surgical debridement, antibiotics, and systemic agents, are often limited due to the nature of the disease. Furthermore, palpation may lead to misinterpretation of a fistula for a nodule, which can produce an erroneous assignment of the stage of abscesses, and fistulae may also be subject to reinterpretation under imaging. Palpation seems to be limited spatially because of the strong presence of inflammation and it may lead to misinterpretation of a fistula for a nodule, which can produce an erroneous assignment of the stage of...
-La ecografía Doppler color es el examen de imágenes de elección para el soporte del diagnóstico y tratamiento en HS

-Permite detectar y monitorear lesiones subclínicas y vascularización

-Ayuda a establecer la actividad y/o severidad

Examen clínico solo puede subestimar la severidad de HS

Ultrasonido puede ser una herramienta que apoye al diagnóstico y permita establecer extension, tipo de lesiones y severidad

HS puede ser susceptible de estadiar sonográficamente

La provisión de esta información puede apoyar un mejor y más temprano diagnóstico y manejo en esta compleja enfermedad

El US permite proveer información subclínica objetiva que puede ser utilizable en clinical trials