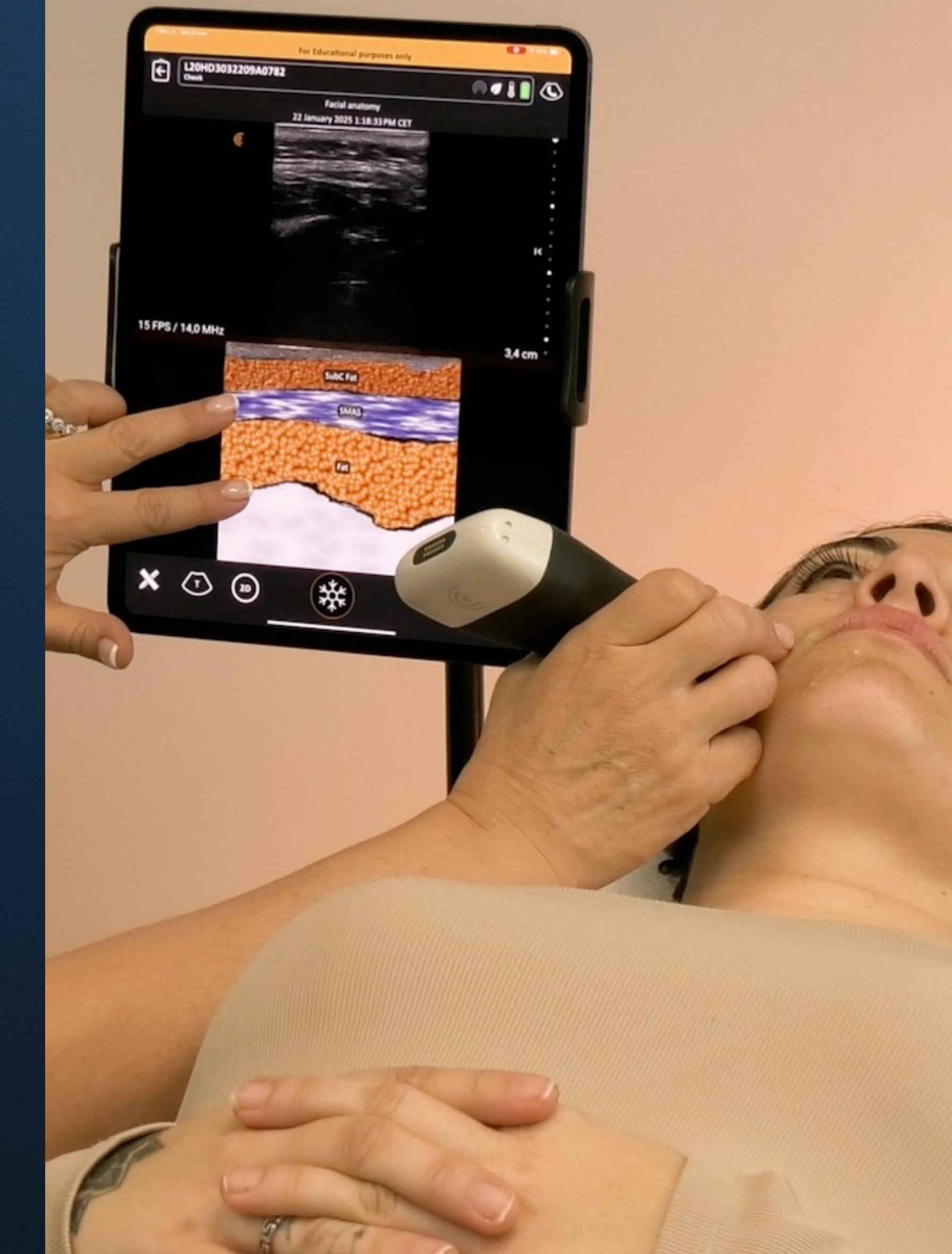




WEBINAR

Ecografía Facial Estética: Evaluación del SLEB, Planos Tisulares y Forámenes Clave

Julio 2025



Tu Anfitriona



Francisco Morando

Presentador | Gerente de Distribución, Clarius

High-frequency ultrasound in anti-aging skin therapy monitoring

“

In aesthetic medicine, the high-frequency ultrasound is applicable to support filler injections, measure dermal thickness before the aesthetic procedure, or monitor the treatment results.”

Czajkowska J, Juszczyk J, Bugdol MN, Glenc-Ambroży M, Polak A, Piejko L, Pietka E. High-frequency ultrasound in anti-aging skin therapy monitoring. *Sci Rep.* 2023 Oct 18;13(1):17799. doi: 10.1038/s41598-023-45126-y. PMID: 37853086; PMCID: PMC10584894.

Randomized Controlled Trial > *Sci Rep.* 2023 Oct 18;13(1):17799.
doi: 10.1038/s41598-023-45126-y.

High-frequency ultrasound in anti-aging skin therapy monitoring

Joanna Czajkowska ¹, Jan Juszczyk ², Monika Natalia Bugdol ², Małgorzata Glenc-Ambroży ³, Anna Polak ⁴, Laura Piejko ⁴, Ewa Pietka ²

Affiliations + expand

PMID: 37853086 PMCID: PMC10584894 DOI: 10.1038/s41598-023-45126-y

Abstract

Over the last few decades, high-frequency ultrasound has found multiple applications in various diagnostic fields. The fast development of this imaging technique opens up new diagnostic paths in dermatology, allergology, cosmetology, and aesthetic medicine. In this paper, being the first in this area, we discuss the usability of HFUS in anti-aging skin therapy assessment. The fully automated algorithm combining high-quality image selection and entry echo layer segmentation steps followed by the dermal parameters estimation enables qualitative and quantitative evaluation of the effectiveness of anti-aging products. Considering the parameters of subcutaneous layers, the proposed framework provides a reliable tool for TCA-peel therapy assessment; however, it can be successfully applied to other skin-condition-related problems. In this randomized controlled clinical trial, forty-six postmenopausal women were randomly assigned to the experimental and control groups. Women were treated four times at one-week intervals and applied skin cream daily between visits. The three month follow-up study enables measurement of the long-term effect of the therapy. According to the results, the TCA-based therapy increased epidermal (entry echo layer) thickness, indicating that the thinning process has slowed down and the skin's condition has improved. An interesting outcome is the obtained growth in the intensity of the upper dermis in the experimental group, which might suggest a reduced photo-aging effect of TCA-peel and increased water content. The same conclusions connected with the anti-aging effect of TCA-peel can be drawn by observing the parameters describing the contribution of low and medium-intensity pixels in the upper dermis. The decreased share of low-intensity pixels and increased share of medium-intensity pixels in the upper dermis suggest a significant increase in local protein synthesis.

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[PubMed Disclaimer](#)

Conflict of interest statement

The authors declare no competing interests.

Figures

Characterization of skin aging through high-frequency ultrasound imaging as a technique for evaluating the effectiveness of anti-aging products and procedures

“

...high-frequency ultrasound imaging allows a higher level of evaluation of the efficacy of dermatological procedures and cosmetic products.”

Vergilio MM, Vasques LI, Leonardi GR. Characterization of skin aging through high-frequency ultrasound imaging as a technique for evaluating the effectiveness of anti-aging products and procedures: A review. *Skin Res Technol.* 2021 Sep;27(5):966-973. doi: 10.1111/srt.13033. Epub 2021 Mar 31. PMID: 33788312.

Characterization of skin aging through high-frequency ultrasound imaging as a technique for evaluating the effectiveness of anti-aging products and procedures: A review

Mariane Massufero Vergilio ¹, Louise Idalgo Vasques ², Gislaine Ricci Leonardi ^{1,2}

Affiliations + expand

PMID: 33788312 DOI: [10.1111/srt.13033](https://doi.org/10.1111/srt.13033)

Abstract

Introduction: High-frequency ultrasound skin imaging analysis (HFUS) is a non-invasive technique that allows a unique approach to the analysis of skin aging, as well as in evaluating the effectiveness of dermatological and cosmetic products, especially for skin rejuvenation.

Objective: To describe the impact of skin aging and different anti-aging strategies from the perspective of high-frequency ultrasound.

Methods: A bibliographic survey was carried out, selecting relevant articles that evaluated the characterization of the skin features from different points of view such as gender (male and female), age (young skin and mature skin), and ethnicity, in addition to individual variations between body regions and daily variations.

Results: Some studies also evaluated the impact of cosmetic treatments and esthetic procedures in the skin. Parameters such as dermal thickness, echogenicity, skin texture, and subepidermal low-echogenic band (SLEB) were analyzed. It can be concluded that there is a trend, although not unanimous in the consequences of aging on the skin, being different between men and women, plus the individual nuances resulted from each one's lifestyle and exposure to the sun.

Conclusion: As for the technique, it is concluded that high-frequency ultrasound is an important evaluative alternative for dermatological studies and the effectiveness of anti-aging products and treatments.

Keywords: anti-aging strategies; dermis age-related echogenicity; high-frequency ultrasound; skin aging; subepidermal low-echogenic band.

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¿Usa ecografía en
su práctica
actualmente?
Encuesta Interactiva

Su Oradora Invitada Experta



Dra. Karina Ravera, MD

Médica Especialista en Diagnóstico por
Imágenes | Post grado en Medicina Estética



WEBINAR

**Ecografía facial estética:
evaluación del SLEB, planos
tisulares y forámenes clave**

Dra. Karina Ravera





DRA. KARINA RAVERA

Médica Especialista Diagnóstico por Imágenes

Especial dedicación en Radiología de tejidos blandos

Posgrado en Medicina Estética Universidad de Buenos Aires

Miembro Patient Safety Committee Craniofacial Research and Study Center Miami University USA

Directora MÉdica de Ultraskinus , plataforma de aprendizaje de Ecografía Cutánea e Intervencionismo Percutáneo

Scientific advisor DÉrmica Laboratoires

Docente Master Medicina Estética Universidad de Barcelona

Miembro European Medical College



Anatomía facial

- **Microanatomía ultrasonográfica de la piel**
- **Sleb**
- **Compartimientos grasos superficiales**
- **SMAS**
- **Compartimientos grasos profundos**
- **Superficie ósea y forámenes**

Aspectos técnicos

- **Sondas o transductores de 20 Mhz (15 Mhz).**
- **Aplicar una generosa cantidad de gel**
- **Técnica de escaneo: sin ejercer presión sobre los tejidos blandos**

(Evitar deformaciones anatómicas, disminuir espesores y comprimir estructuras vasculares y lesiones si las hay).



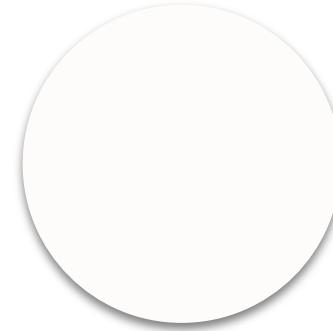
Anatomía facial

- **Microanatomía ultrasonográfica de la piel**
- **Capas de la piel:**
- **Epidermis:** capa externa, alto contenido de queratina (espesor 0,06 - 0,6 mm).
Us: Línea hiperecoica-blanca (doble en piel glabral).
- **Dermis:** capa intermedia. Alto contenido en colágeno y elastina (espesor 1-4 mm).
Us: Dermis papilar o superficial, hipoecoica o gris intermedio.
Dermis reticular o profunda, hiperecoica o gris claro-blanco.
- **Hipodermis o tejido subcutáneo:** capa profunda. Alto contenido de células adiposas y tabiques fibrillares.
Us: hipoecoica o gris oscuro con septos o tabiques hiperecoicos o blancos.

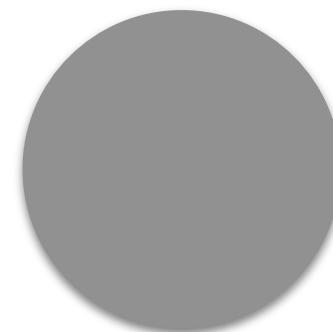
Nomenclatura básica

CLASIFICACIÓN de la ecogenicidad

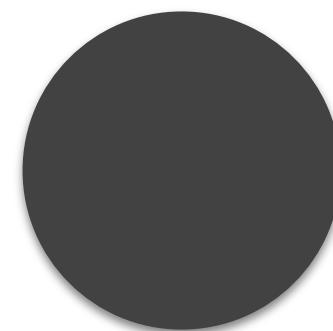
Ecogenicidad es la capacidad de un tejido o estructura para reflejar las ondas de ultrasonido durante un estudio ecográfico. Es la **intensidad del eco** que un tejido devuelve al transductor, y determina **qué tan brillante o qué tan oscuro** se ve ese tejido en la imagen de ultrasonido.



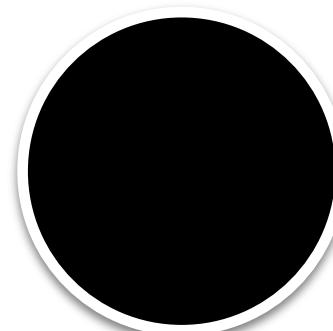
Hiperecoico - blanco o gris claro



Isoecoico -gris similar al tejido contiguo



Hipoecoico - gris oscuro



Anecoico - negro

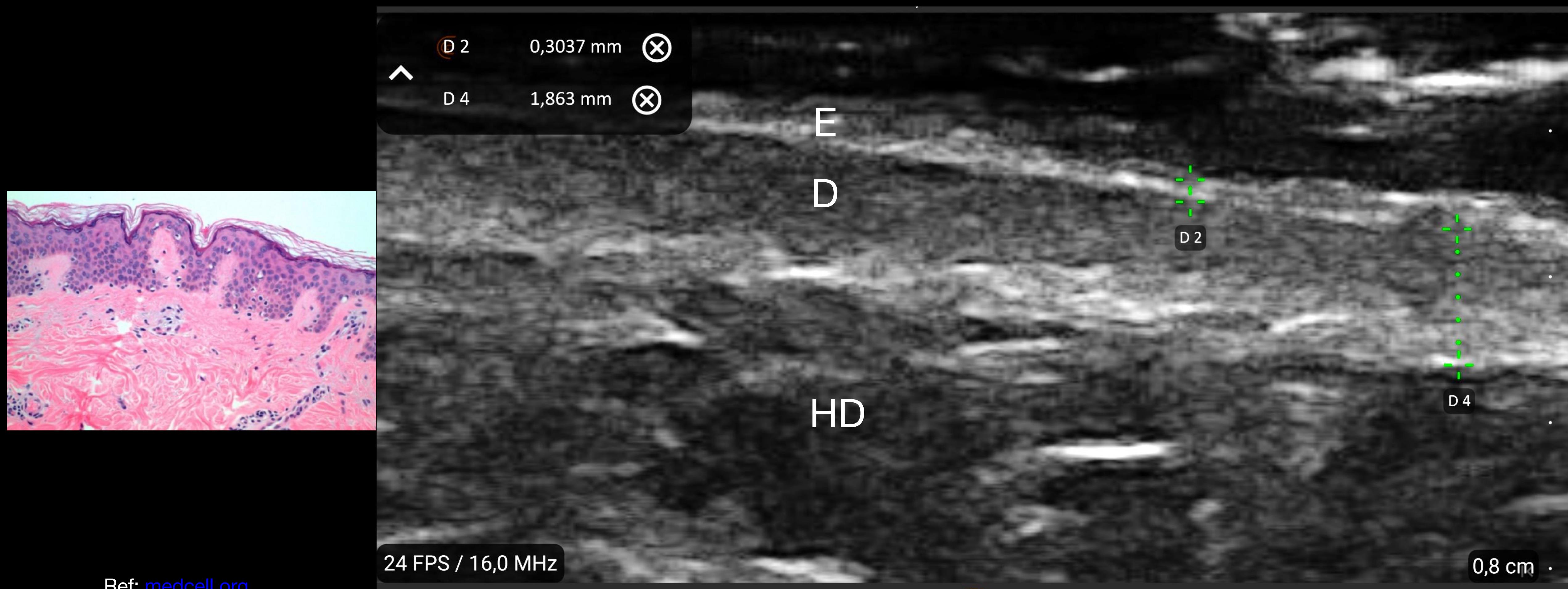
La ecogenicidad de cada capa depende de su componente principal:

✓ **Epidermis: queratina**

✓ **Dermis: Sustancia amorfa fundamental-collágeno**

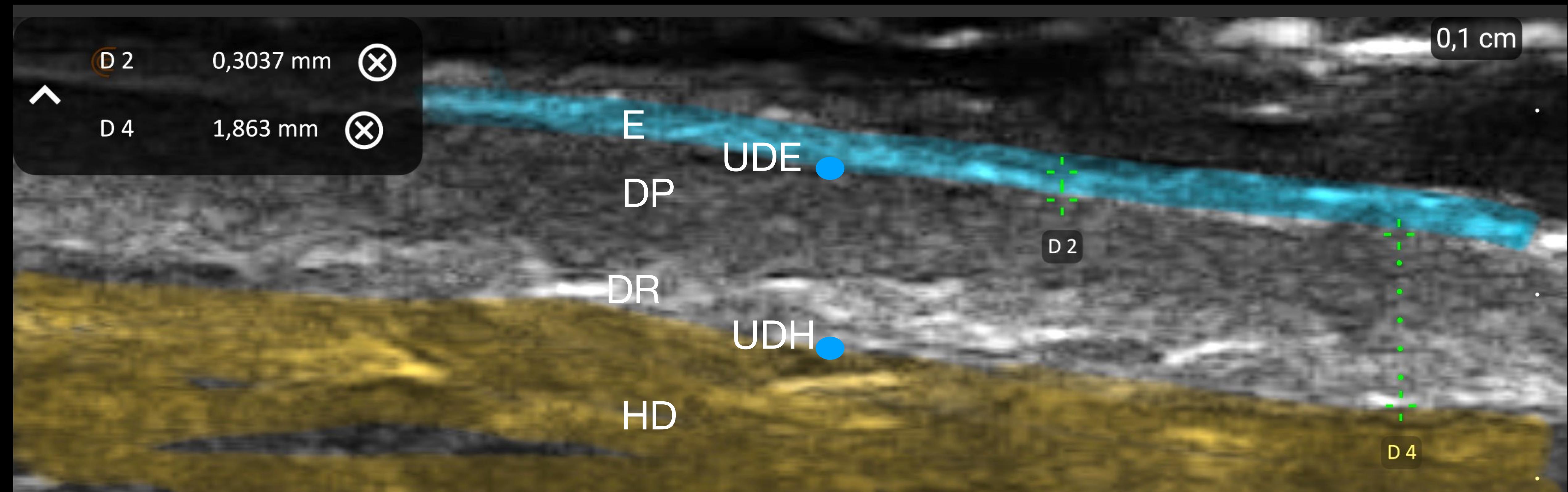
✓ **Hipodermis: lóbulos grasos**

Piel no glabral Clarius L20



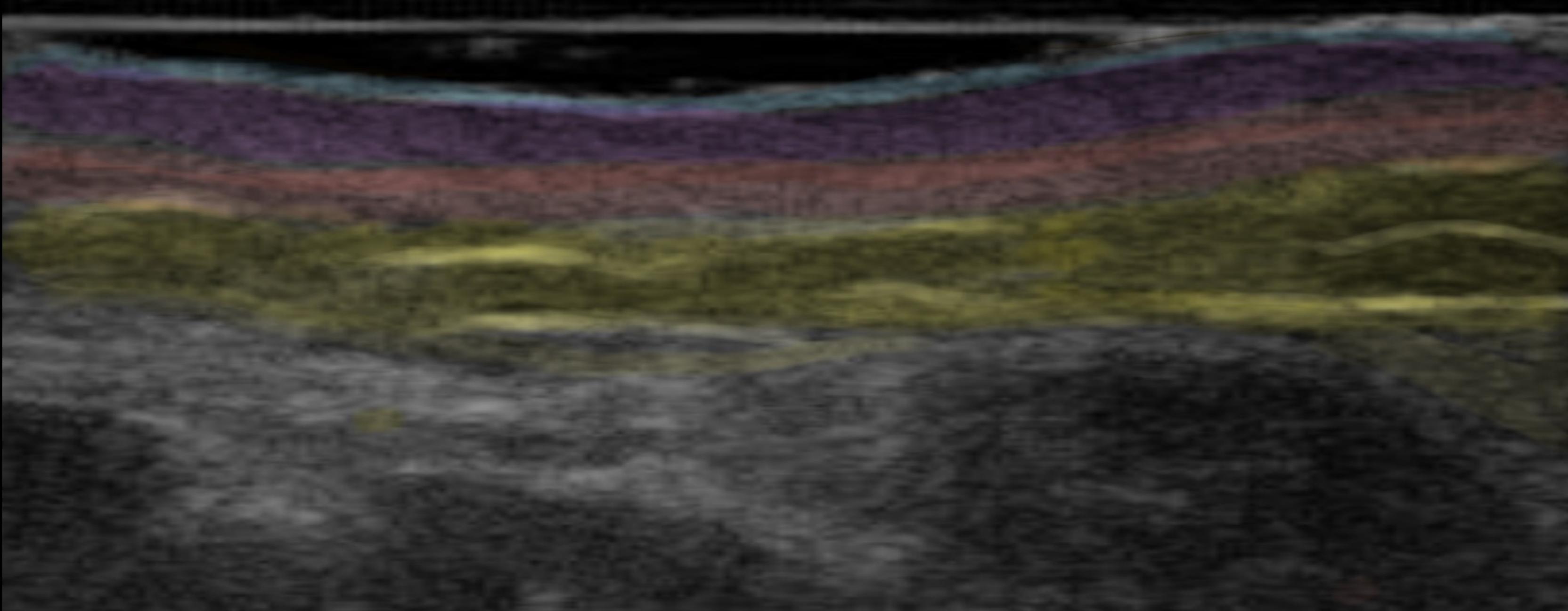
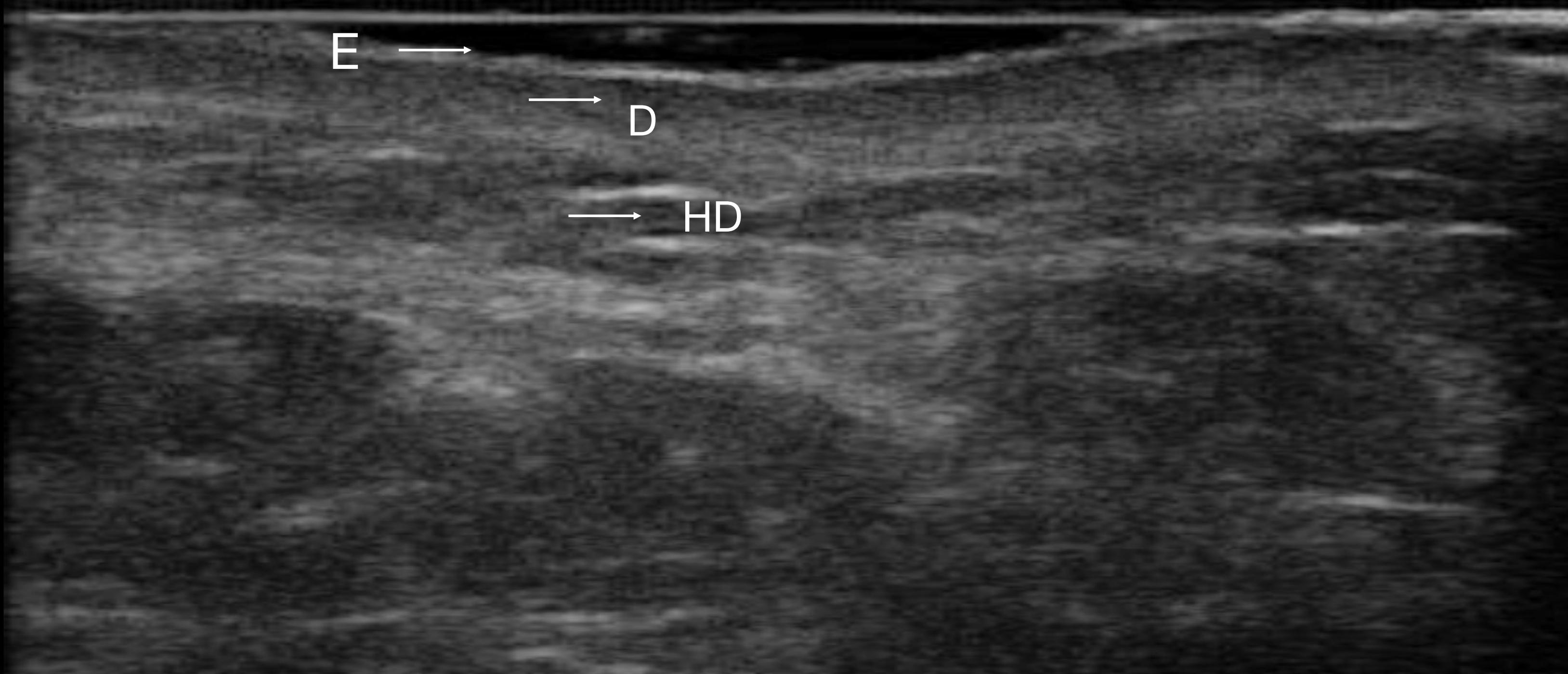
La ecografía de alta resolución es la técnica de imagen que más se asemeja a las imágenes histológicas de la piel.

Piel no glabral Clarius L20



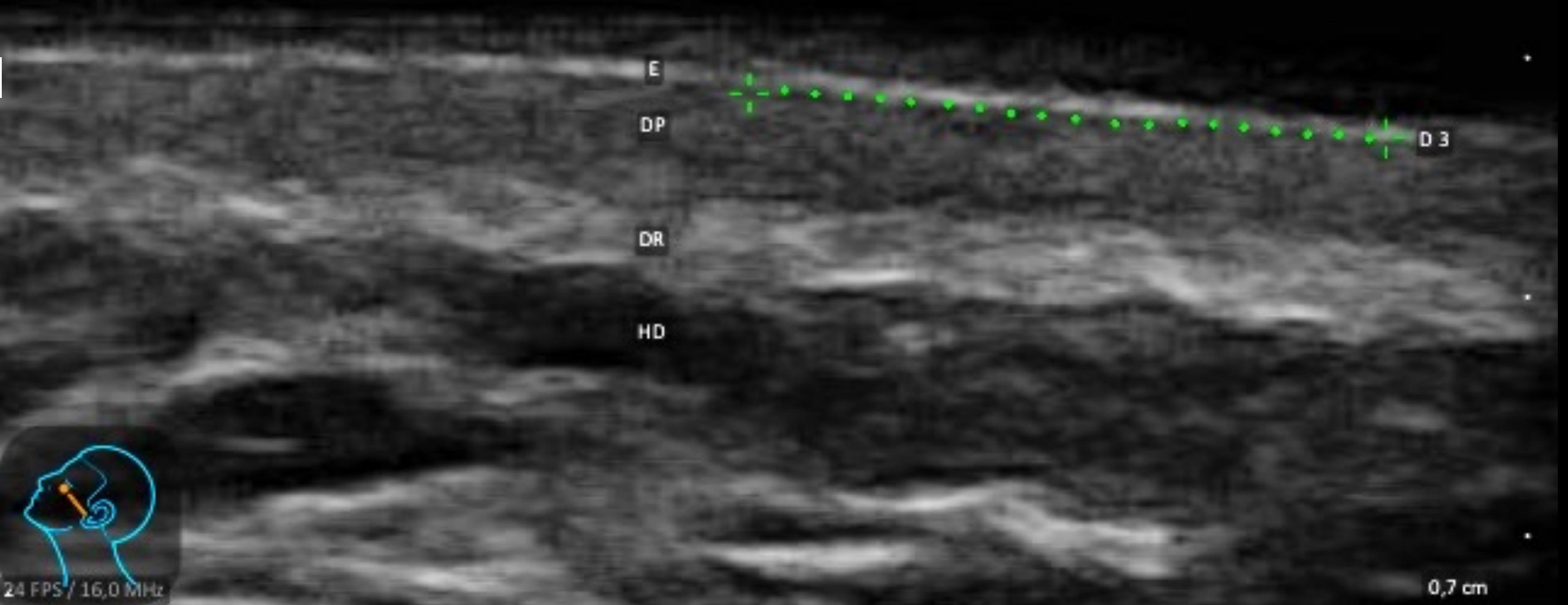
Piel no glabral

Clarius L15

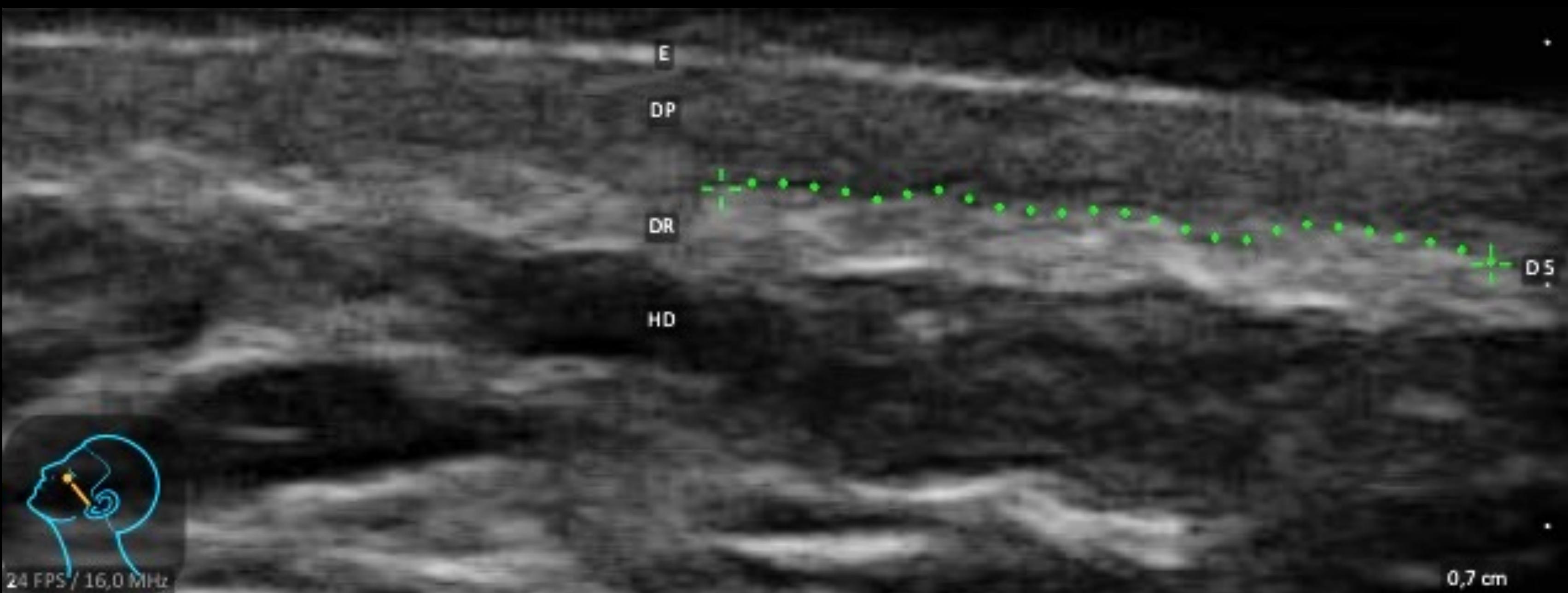


Piel no glabral

Clarius L20



epidermis

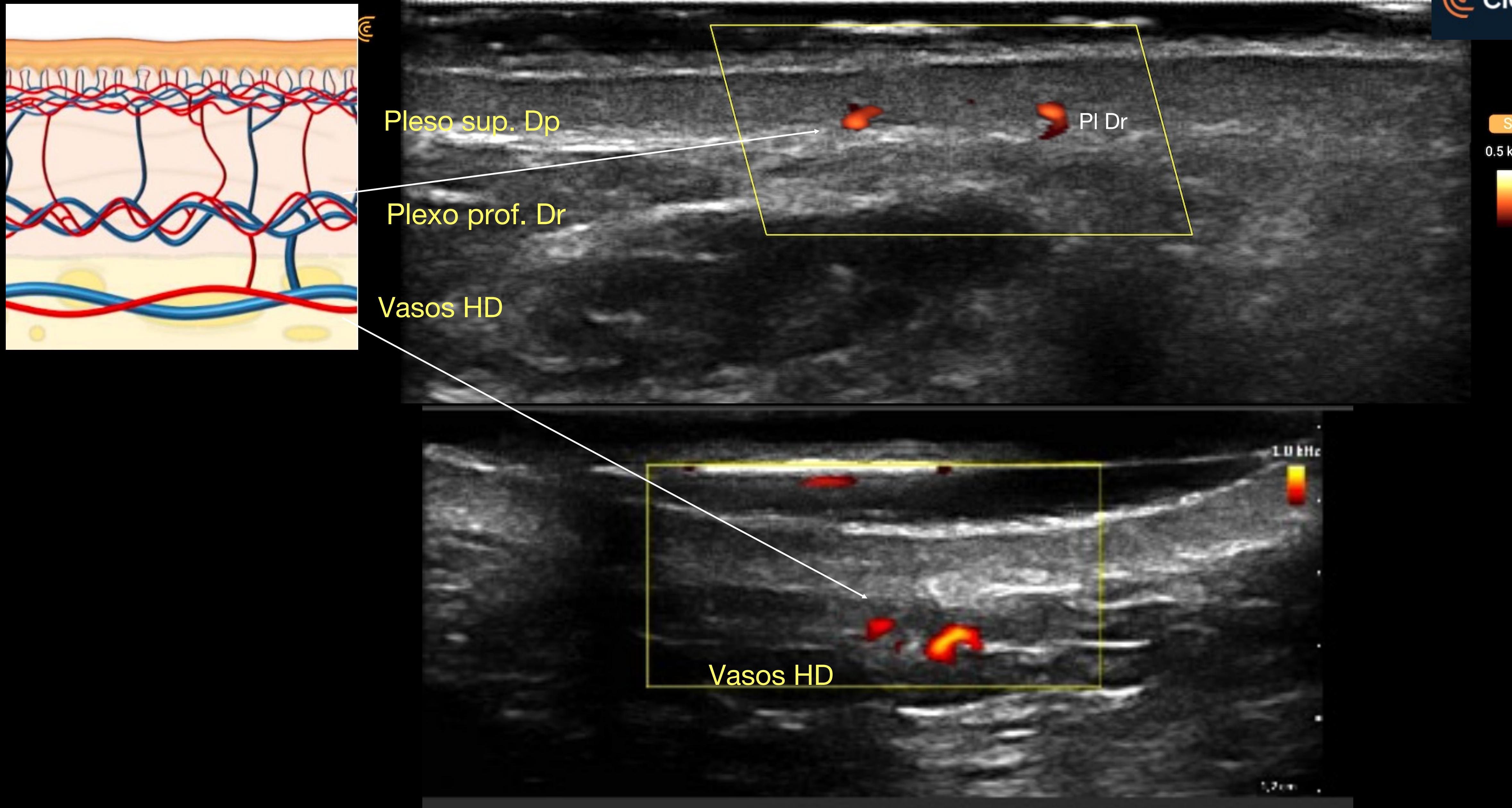


dermis

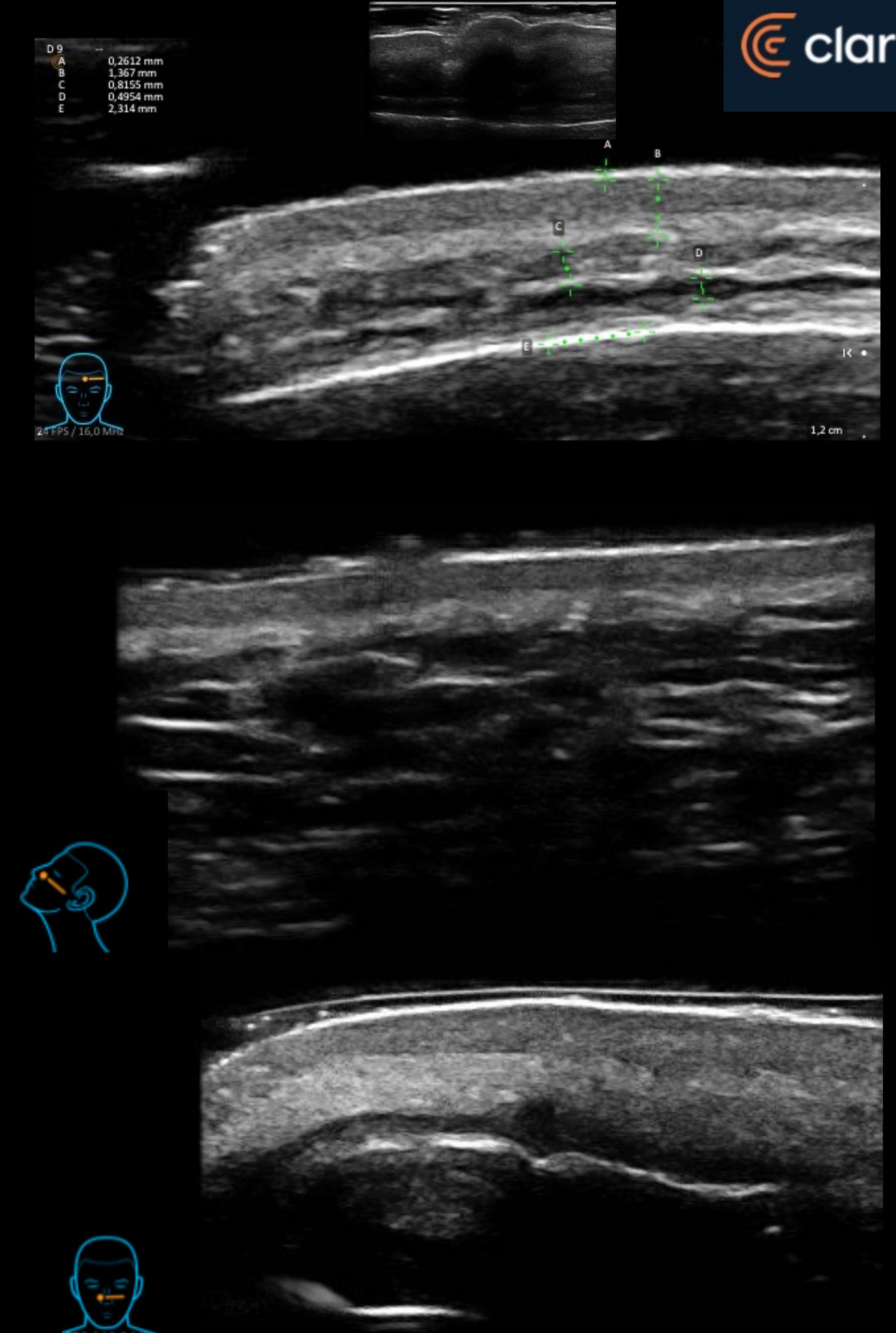
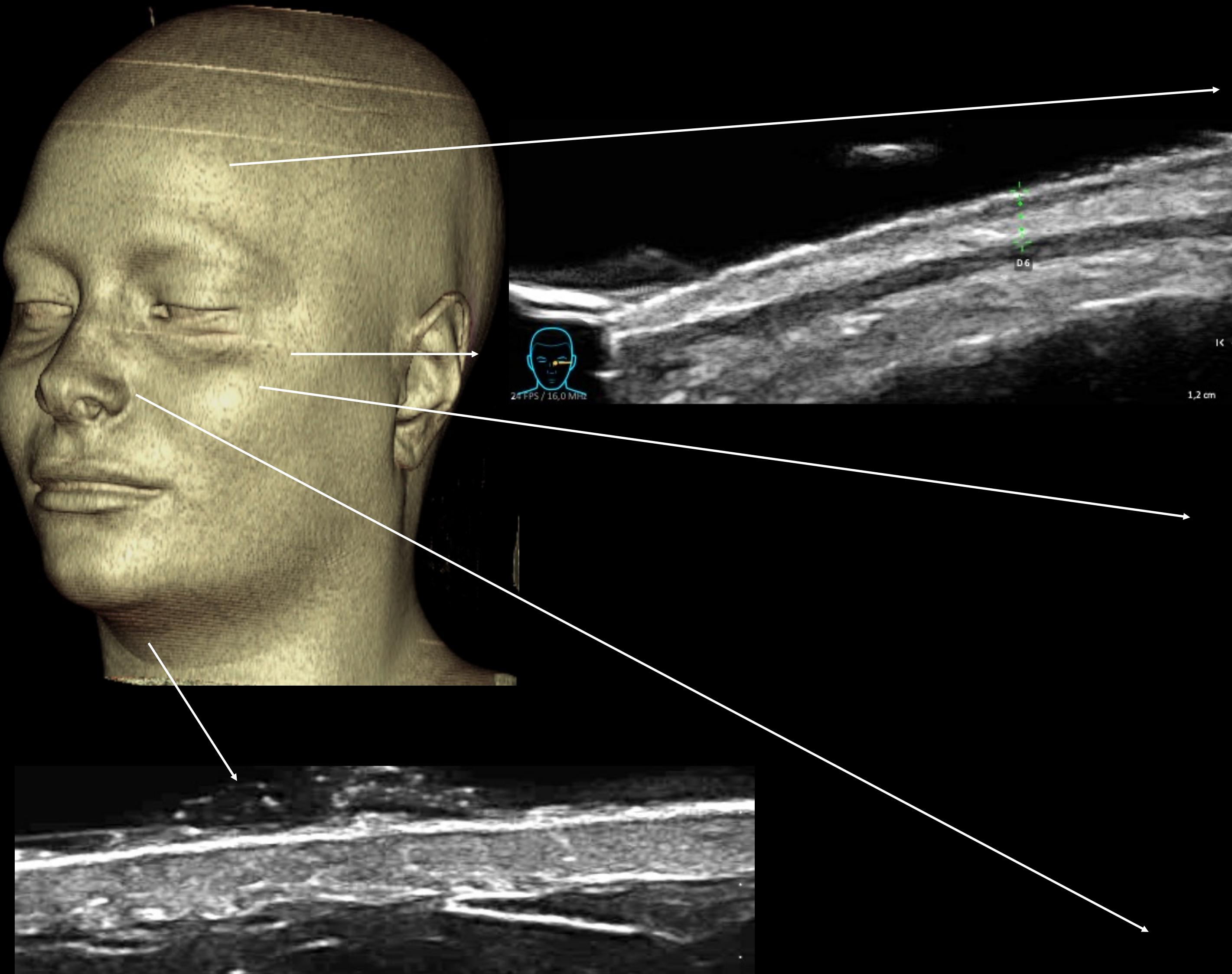
hipodermis

Irrigación vascular de la piel L20

clarius



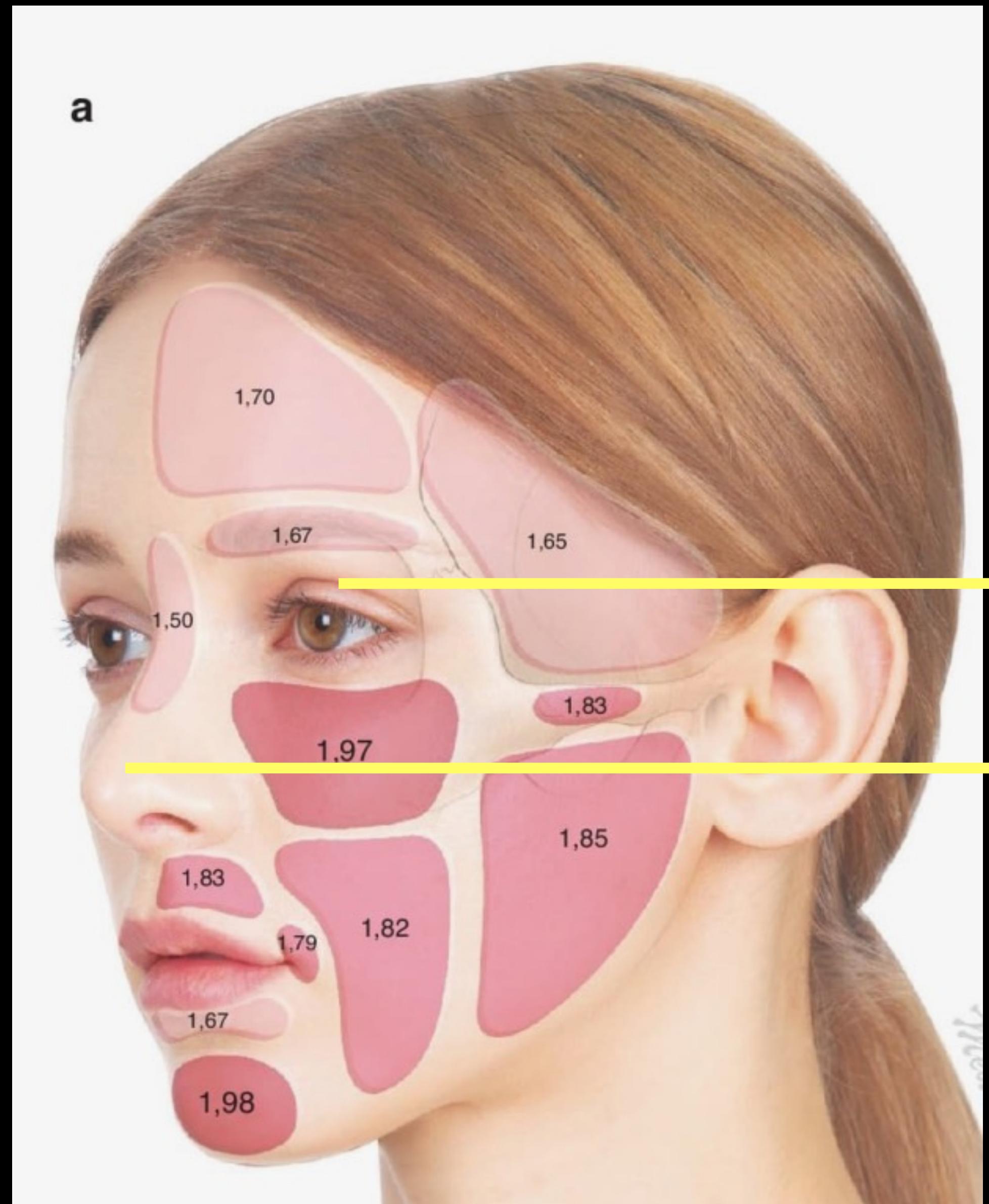
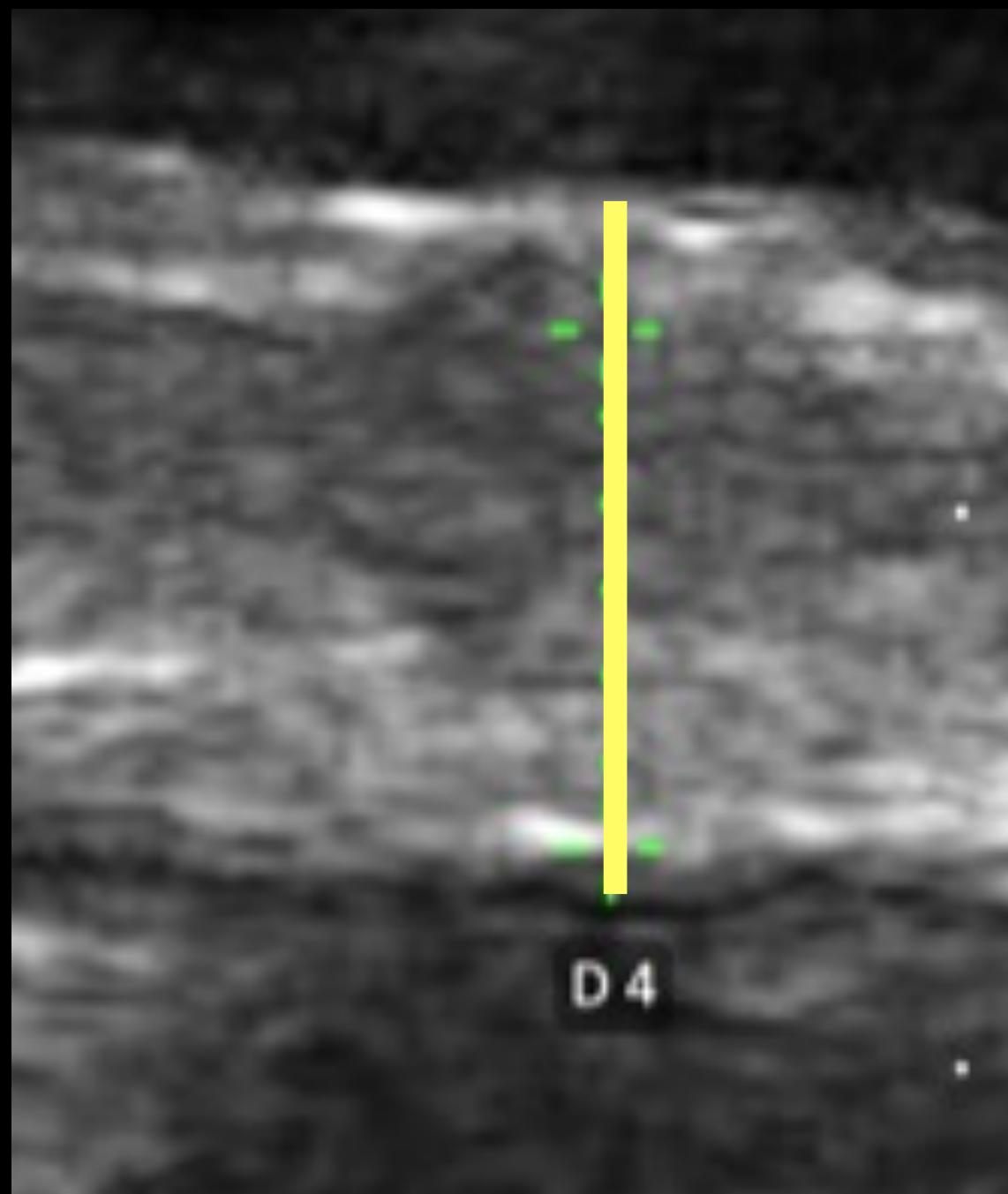
Clarius L20 La piel tiene diferencias en cada zona del rostro (Espesores y relación dermo-epidérmica)



Dif sexo, edad, IMC, etnia .

La piel tiene diferencias en cada zona del rostro

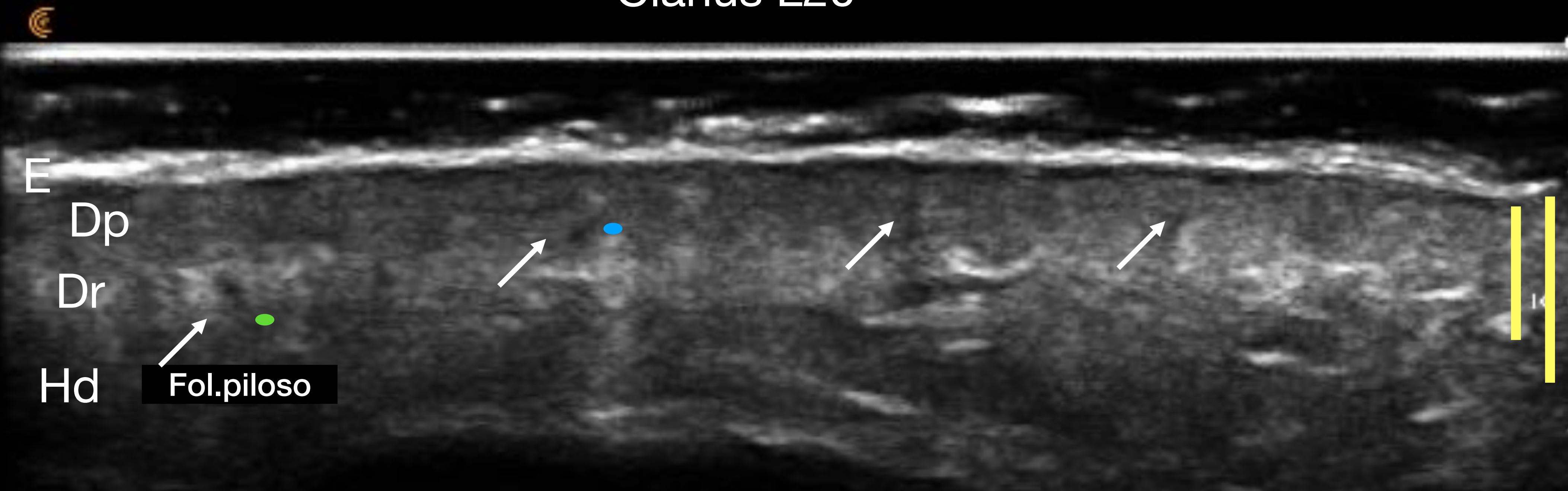
Espesor



Clarius L20

Piel del cuero cabelludo

Clarius L20



Fase telógena: folículo en dermis



Fase anágena: folículo en hipodermis

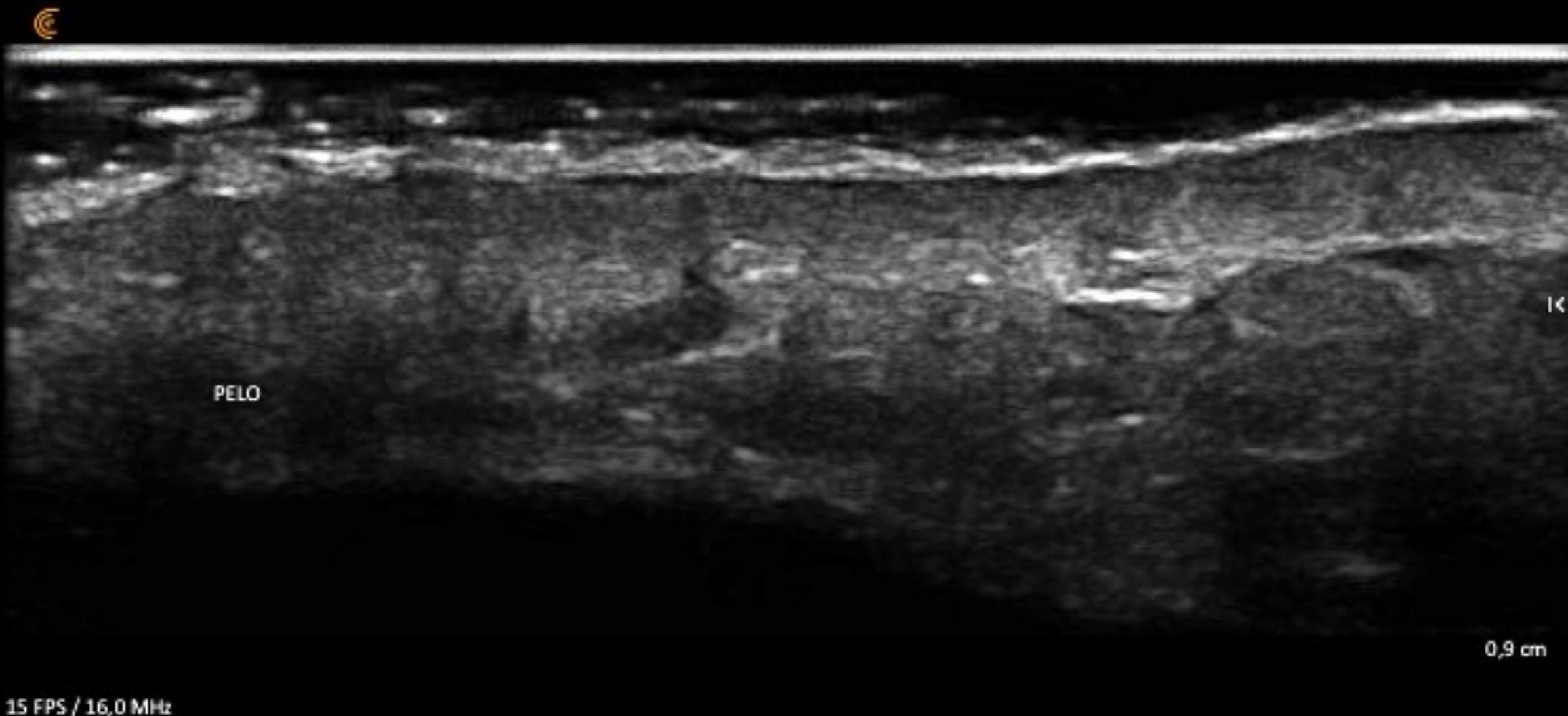


Diferencias en grosor del pelo y número de folículos pilosos

Clarius L20

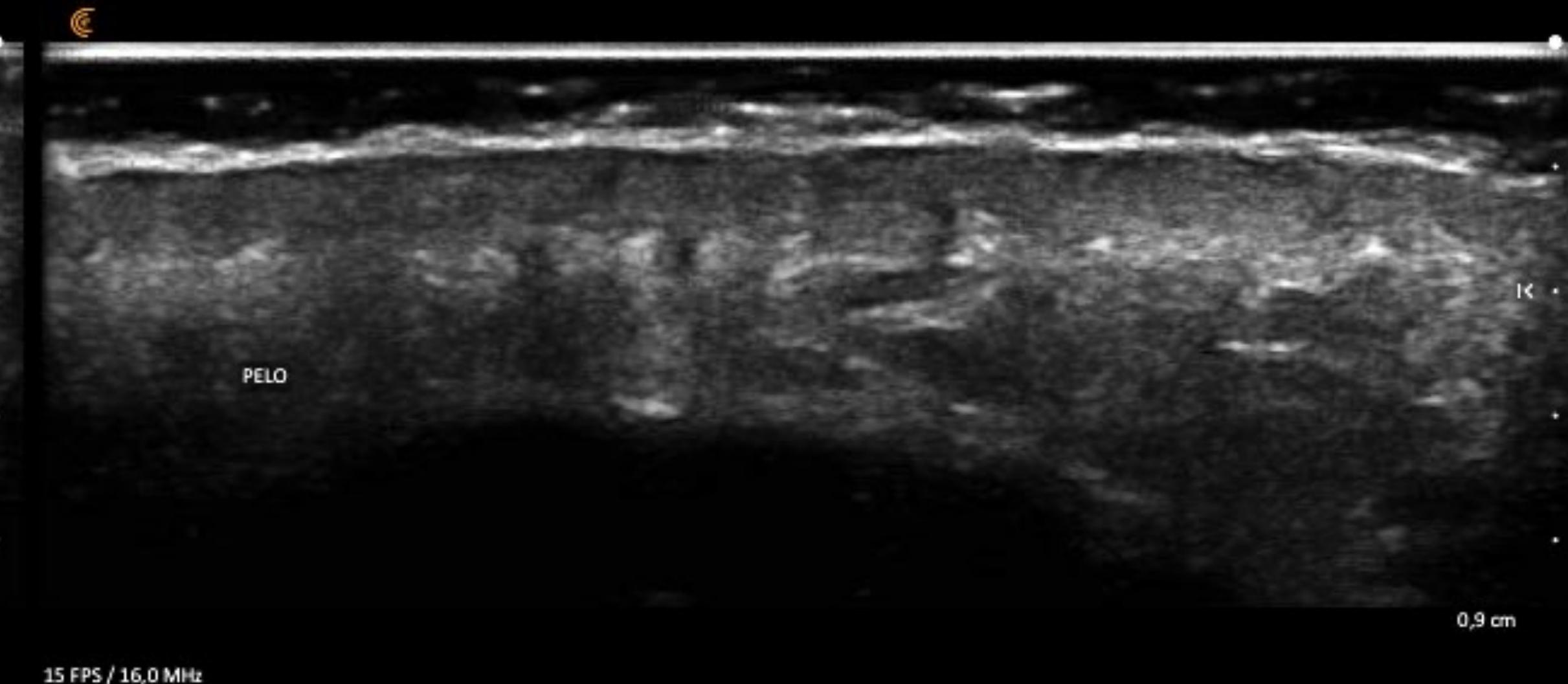
Cuero cabelludo

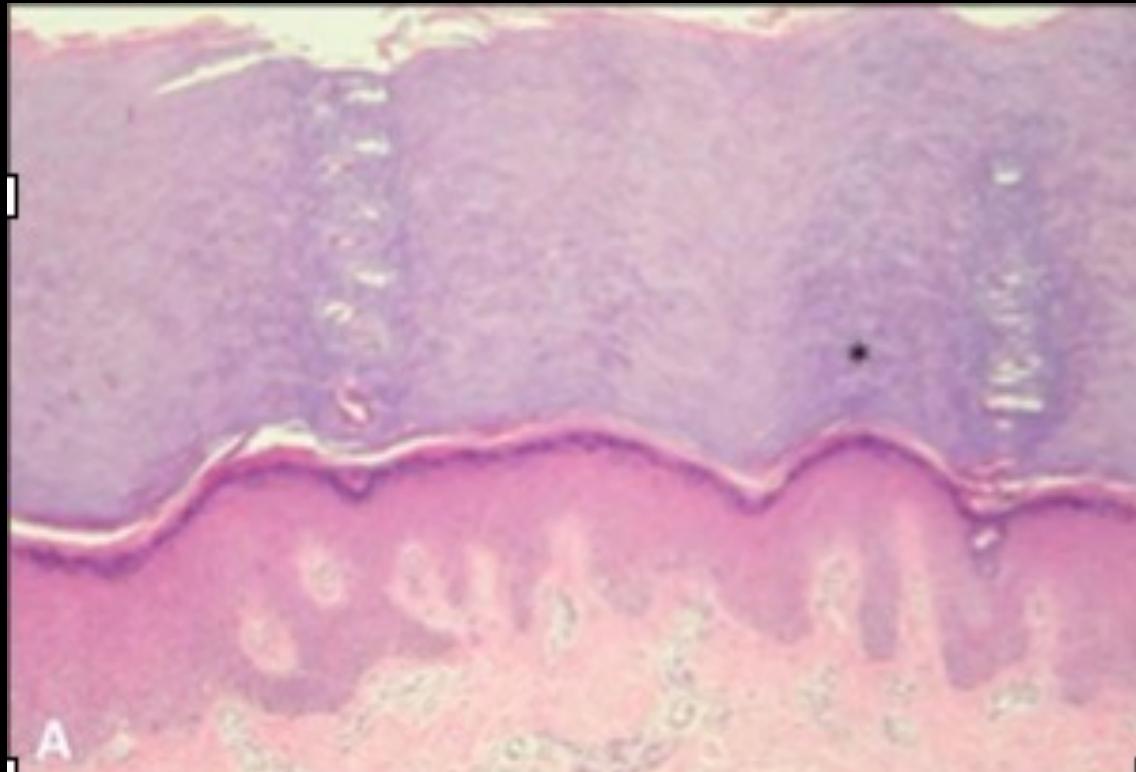
Región frontal



Cuero cabelludo

Región occipital





Piel Glabral

Clarius L20



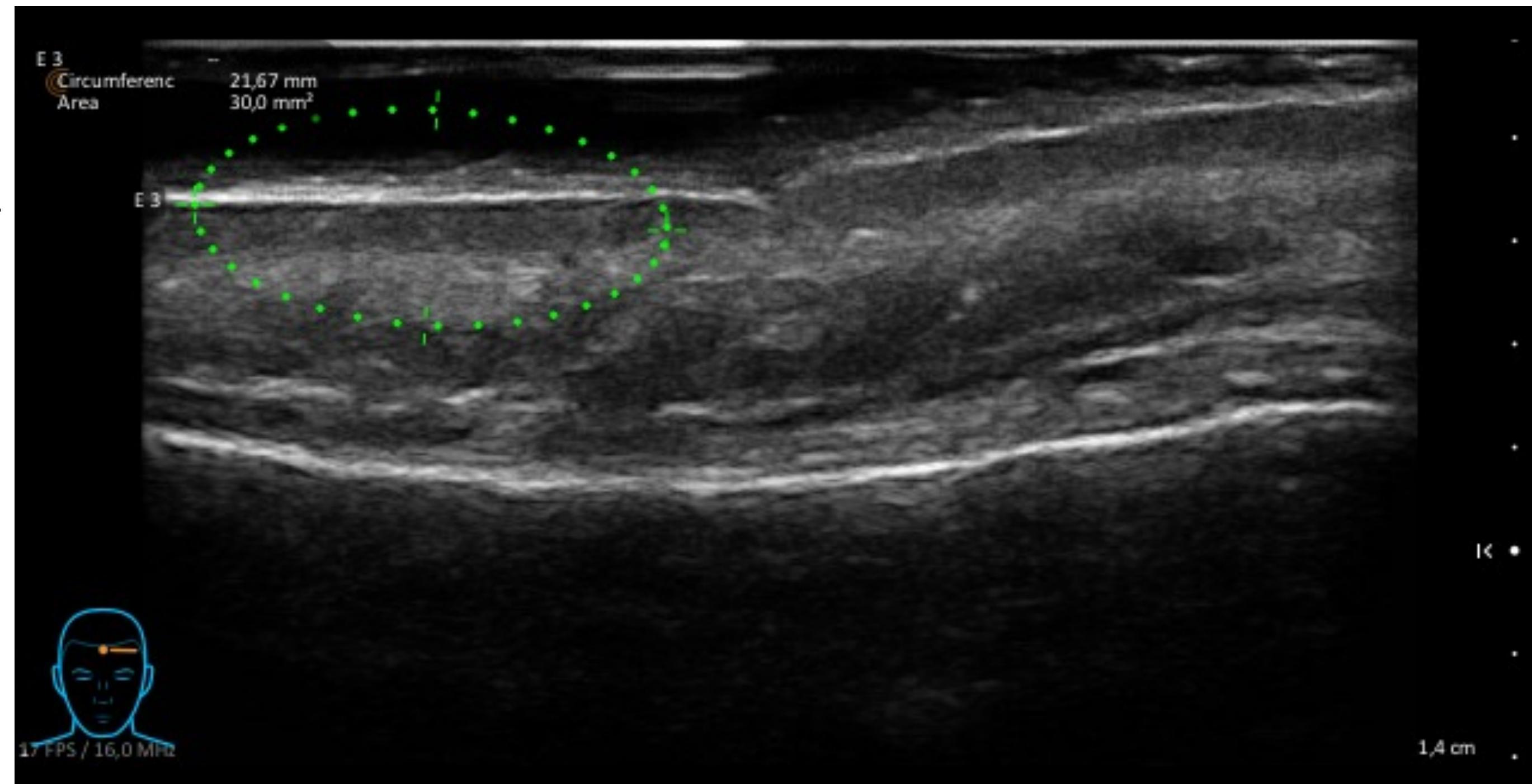
Presenta una capa epidérmica adicional, el **estrato lúcido**, entre el estrato granuloso y el córneo, formado por **células de transición** nucleadas.

US: La epidermis aparece como una **estructura hiperecoica bilaminar**, probablemente por el marcado contraste entre la epidermis y el estrato córneo **grueso y compacto**.

“El primer paso para poder interpretar una imagen ultrasonográfica es reconocer las estructuras anatómicas que componen la zona escaneada”

SLEB (SUBEPIDERMAL LOW ECHOGENIC BAND)

El SLEB es un hallazgo ecográfico que no representa una estructura anatómica específica, sino que corresponde a una alteración funcional y estructural de la dermis papilar, visible como una banda hipoecoica bajo la epidermis en ecografía de alta frecuencia.



SLEB (SUBEPIDERMAL LOW ECHOGENIC BAND)

A nivel molecular e histológico, el SLEB se asocia con los siguientes cambios:

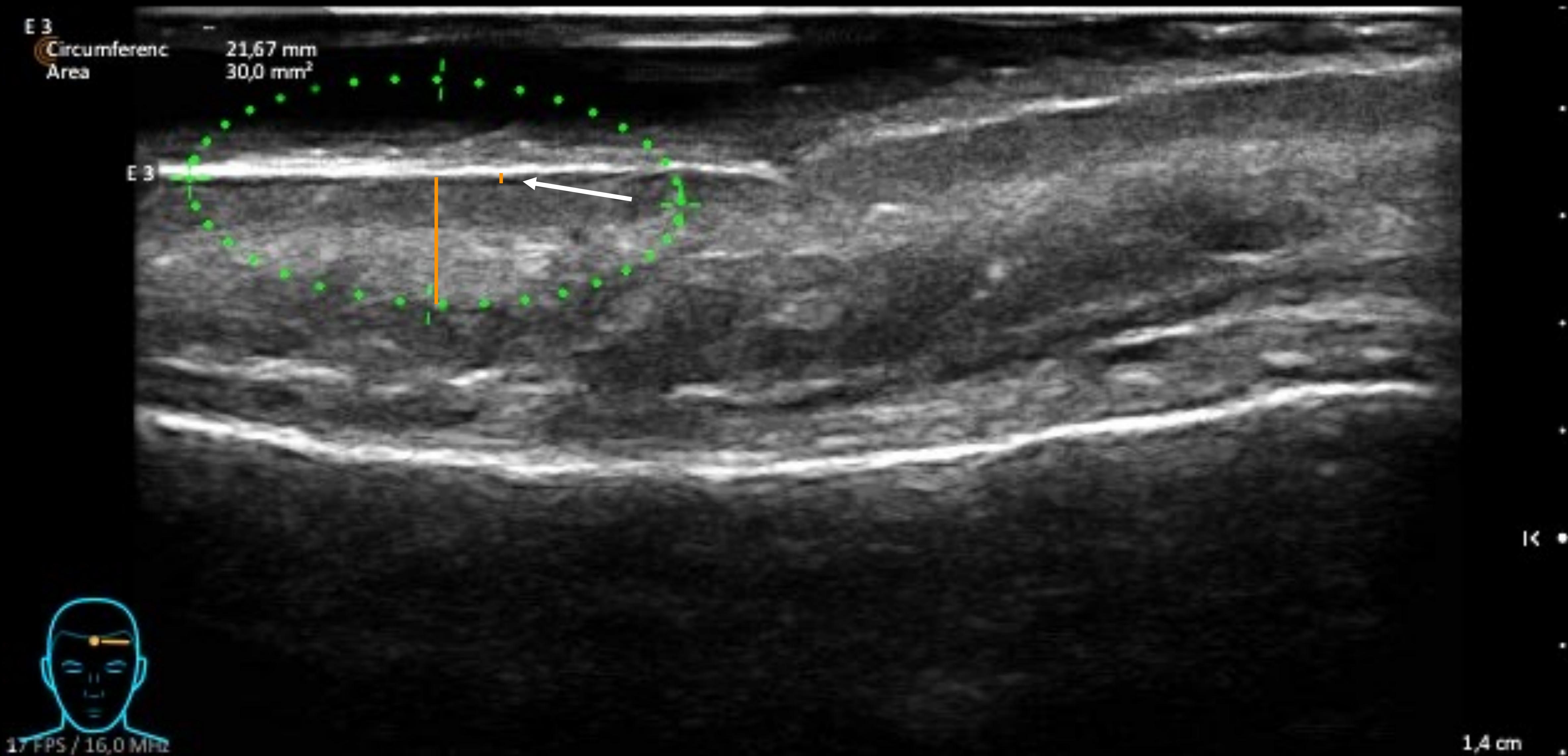
- **Disminución del colágeno tipo I y III**
 - Fragmentación y desorganización de las fibras de colágeno en la dermis papilar.
 - Reducción de la densidad de fibras, lo cual disminuye la reflectividad (hipoecogenicidad).
- **Aumento del contenido de agua por edema intersticial (inflamación aguda y crónica).**
- **Infiltrado inflamatorio crónico**
 - Presencia de células inmunes (linfocitos, mastocitos), sobre todo en dermatitis crónicas como dermatitis atópica, eccema o psoriasis entre otras afecciones.
 - Aumento de la permeabilidad vascular.
- **Degeneración por daño actínico (fotoenvejecimiento)**
 - Elastosis solar y acumulación de material amorfo no fibrilar, principalmente fibras elásticas anómalas, proteoglicanos y glicosaminoglicanos (GAGs).

SLEB (SUBEPIDERMAL LOW ECHOGENIC BAND)

Biomarcador ultrasonográfico objetivo válido y reproducible:

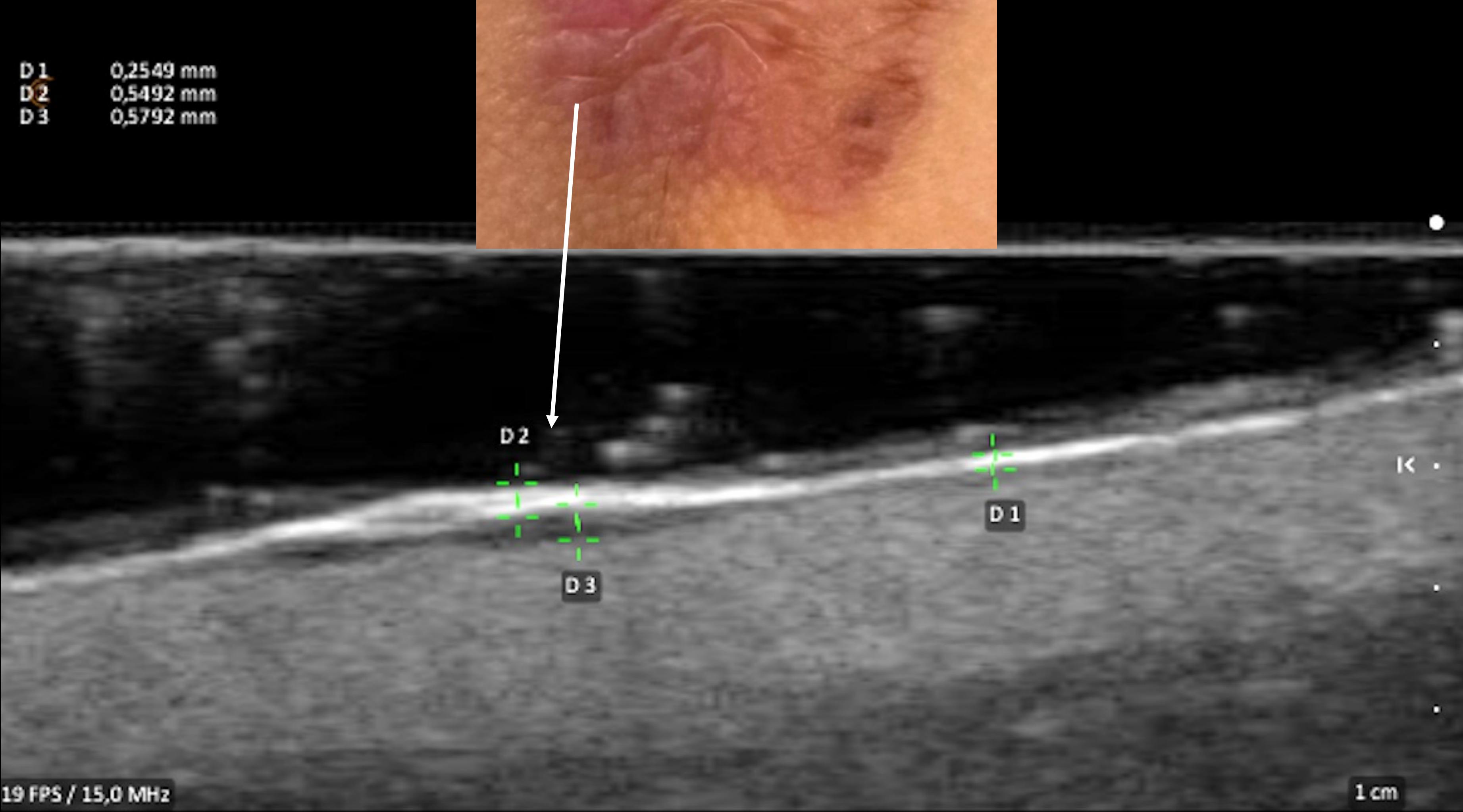
- **Envejecimiento cutáneo**
- **Dermatitis atópica**
- **Psoriasis**
- **Linfomas cutáneos**
- **Liquen**
- **Otros**

Envejecimiento cutáneo: cociente slab/ espesor dermis total

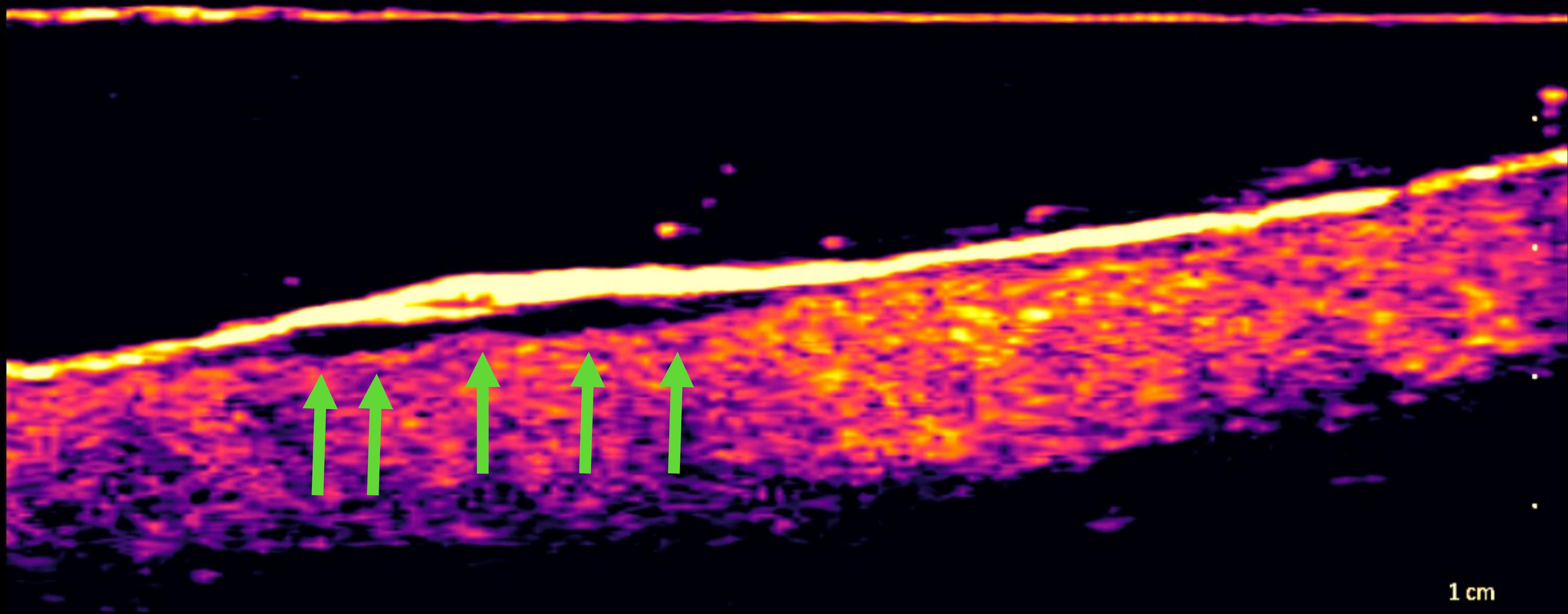




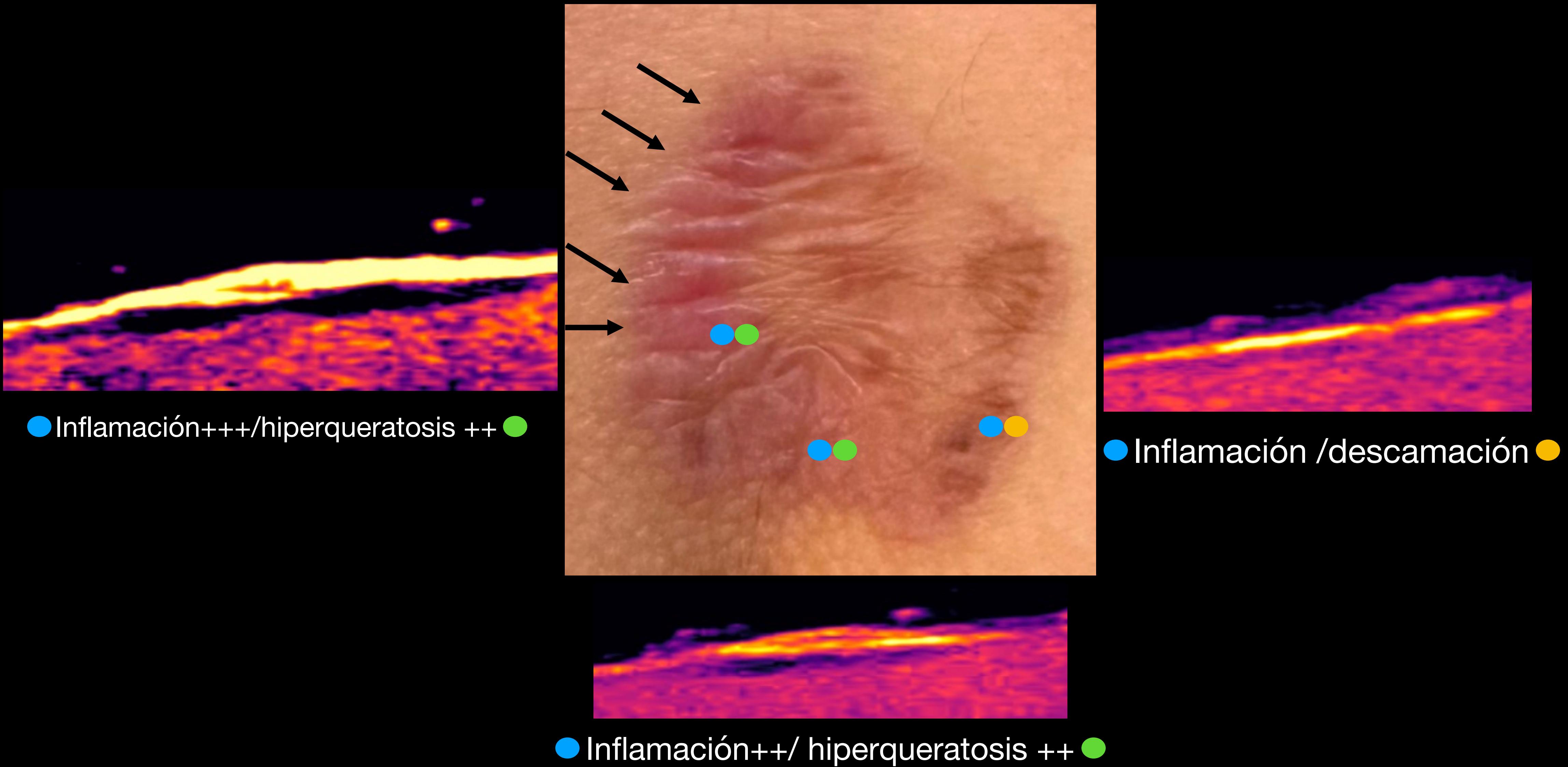
Dermatitis Liquenoide



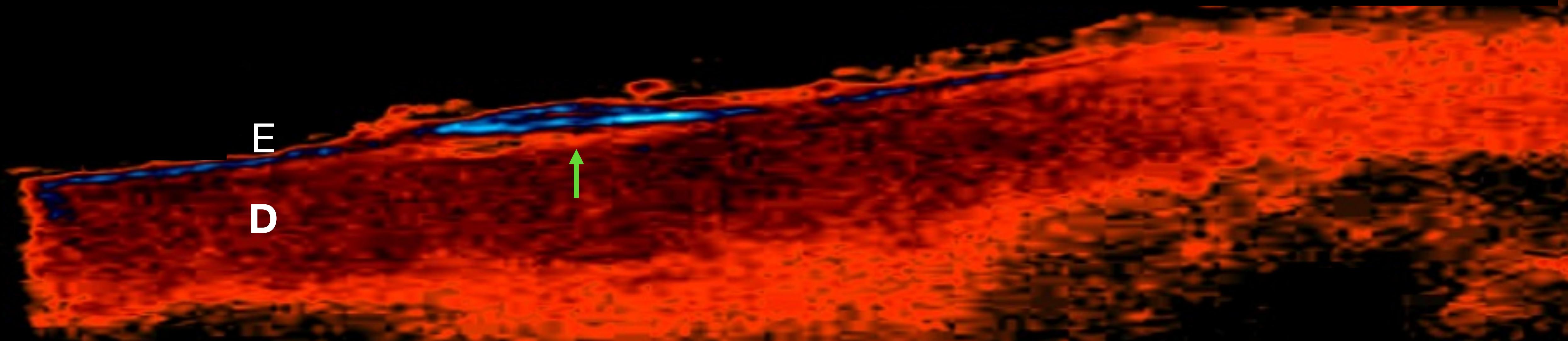
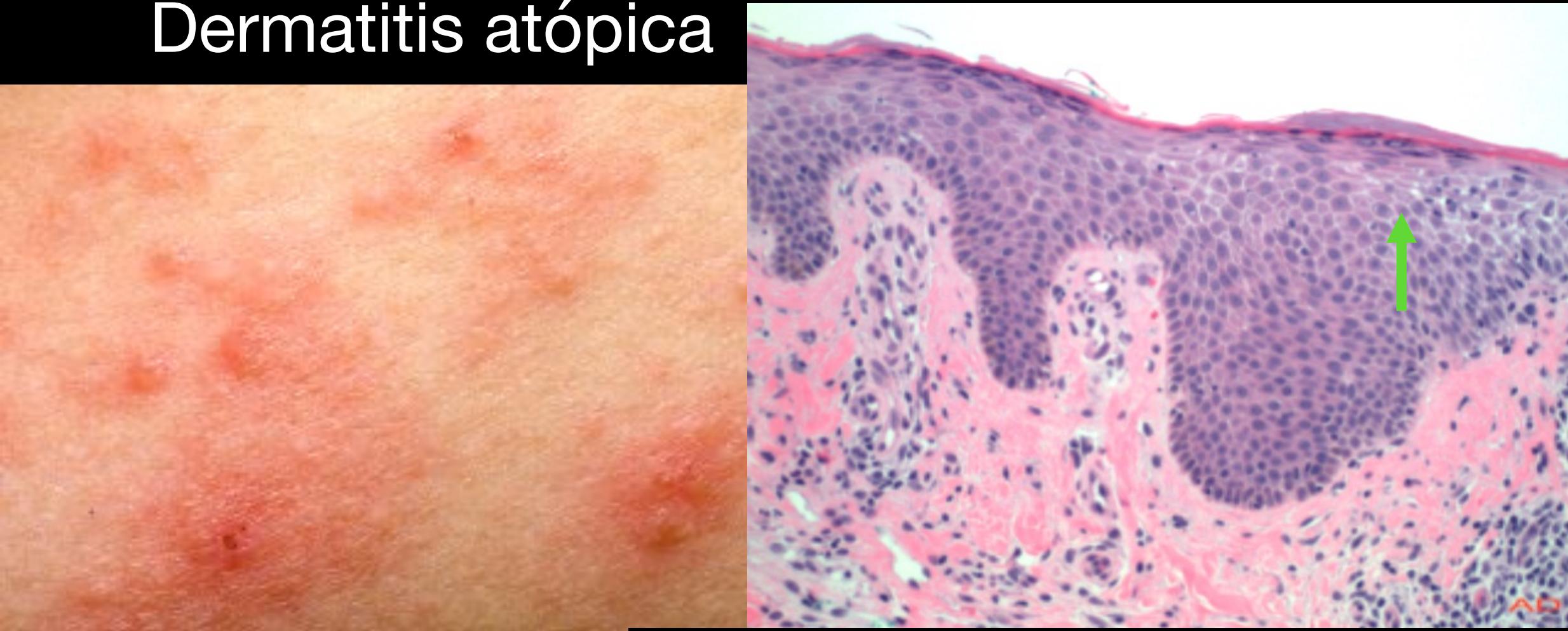
CC



Comparación clínico-ecográfica



Dermatitis atópica



Ecografía facial estética: evaluación del SLEB, planos tisulares y forámenes clave



BIBLIOGRAFÍA

Dermal echogenicity como indicador de exposición UVR

Referencia:

Sandby-Møller J, Thieden E, Philipsen PA, Schmidt G, Wulf HC.

Dermal echogenicity: a biological indicator of individual cumulative UVR exposure?

Arch Dermatol Res. 2004;295(11):498–504.

doi: [10.1007/s00403-004-0454-7](https://doi.org/10.1007/s00403-004-0454-7)

SLEB y su relación con edad y localización anatómica

Referencia:

Sandby-Møller J, Wulf HC.

Ultrasonographic subepidermal low-echogenic band: dependence of age and body site.

Skin Res Technol. 2004;10(1):57–63.

doi: [10.1111/j.1600-0846.2004.00056.x](https://doi.org/10.1111/j.1600-0846.2004.00056.x)

Monopolar RF + ácido glicólico + UBM

Referencia:

Wakade DV, Nayak CS, Bhatt KD.

A study comparing the efficacy of monopolar radiofrequency and glycolic acid peels in facial rejuvenation of aging skin using histopathology and ultrabiomicroscopic sonography (UBM) – an evidence-based study.

HFUS en dermatitis atópica

Referencia:

Polańska A, Silny W, Jenerowicz D, Knioła K, Molińska-Glura M, Dańczak-Pazdrowska A.

Monitoring of therapy in atopic dermatitis – observations with the use of high-frequency ultrasonography.

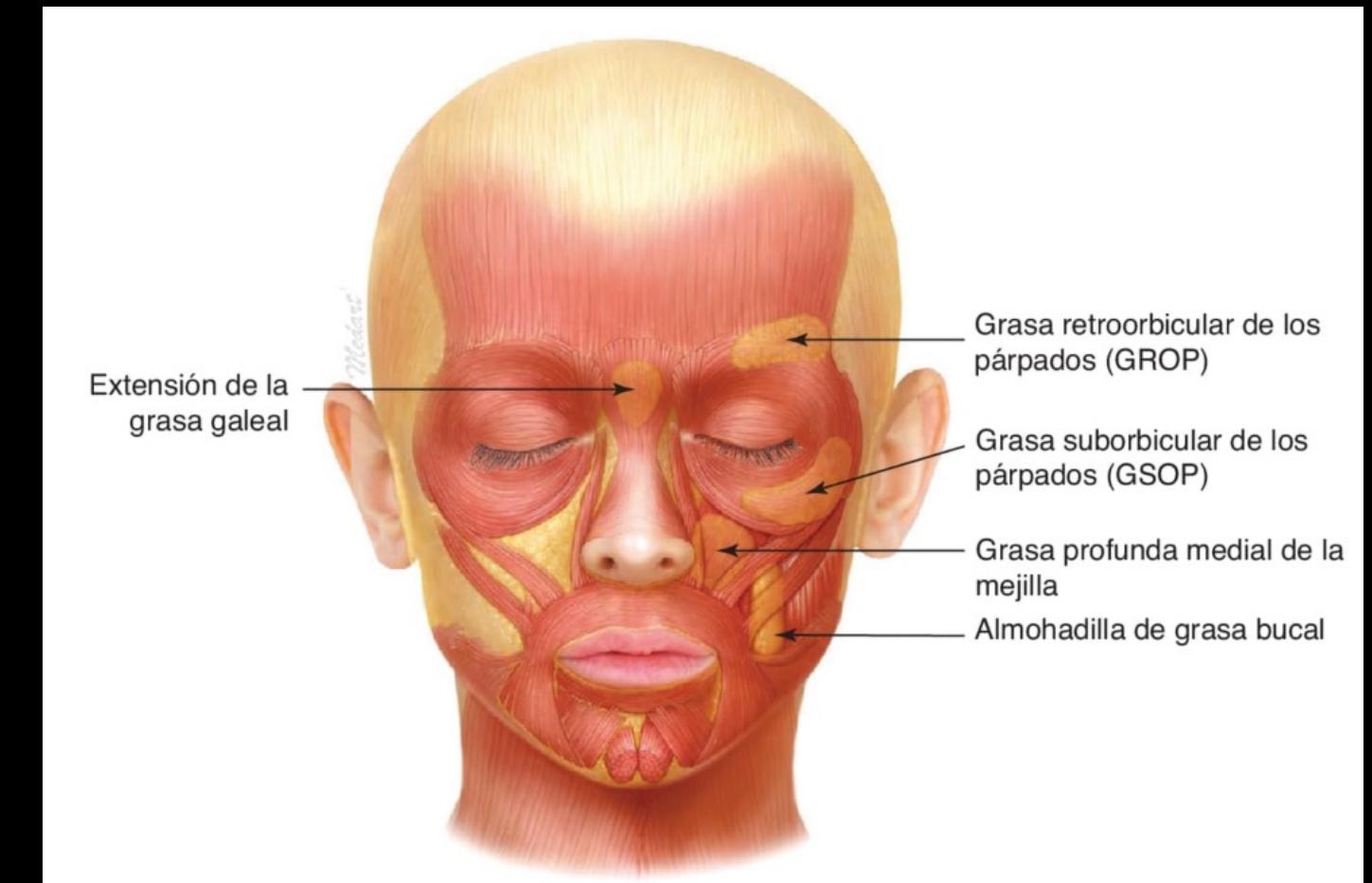
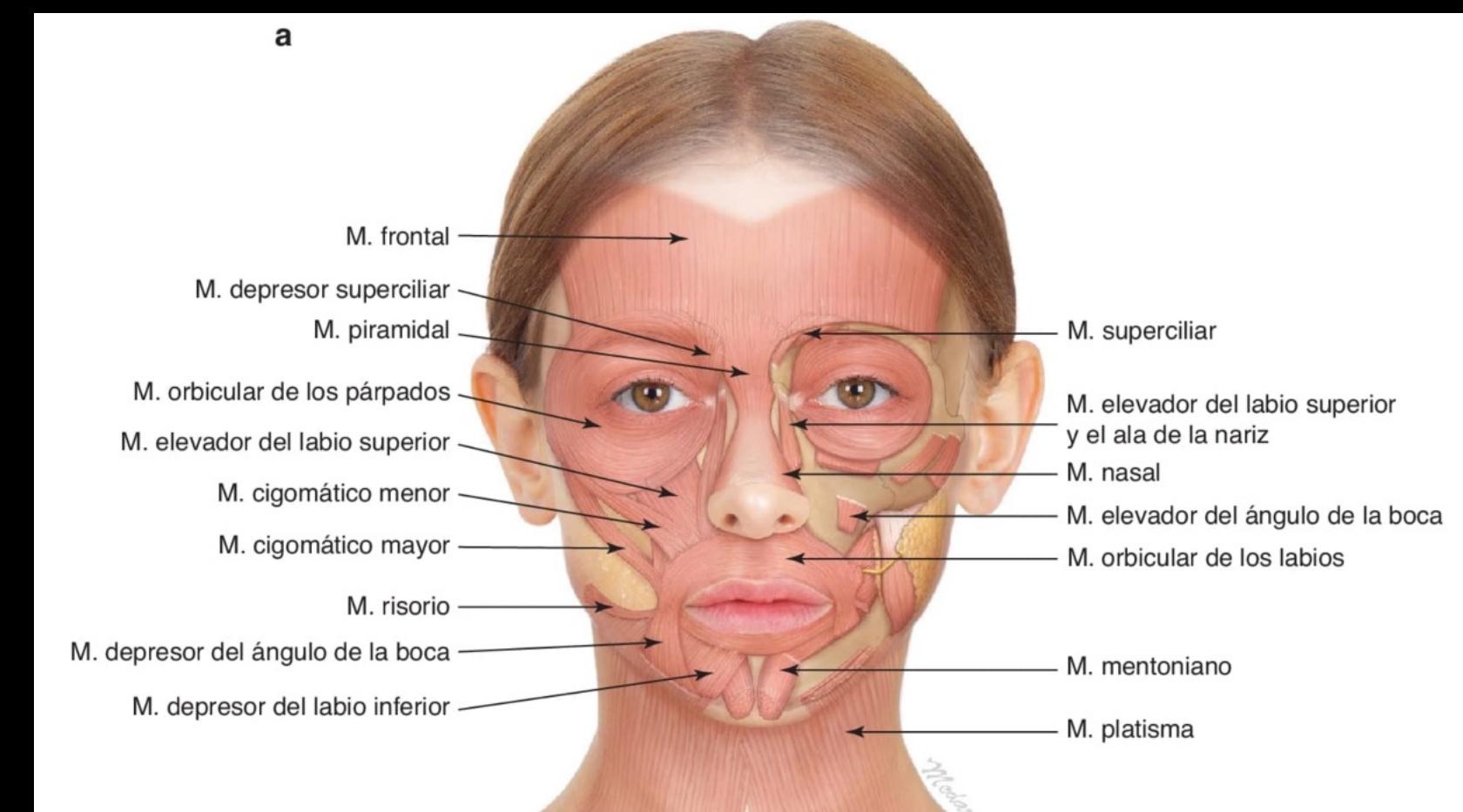
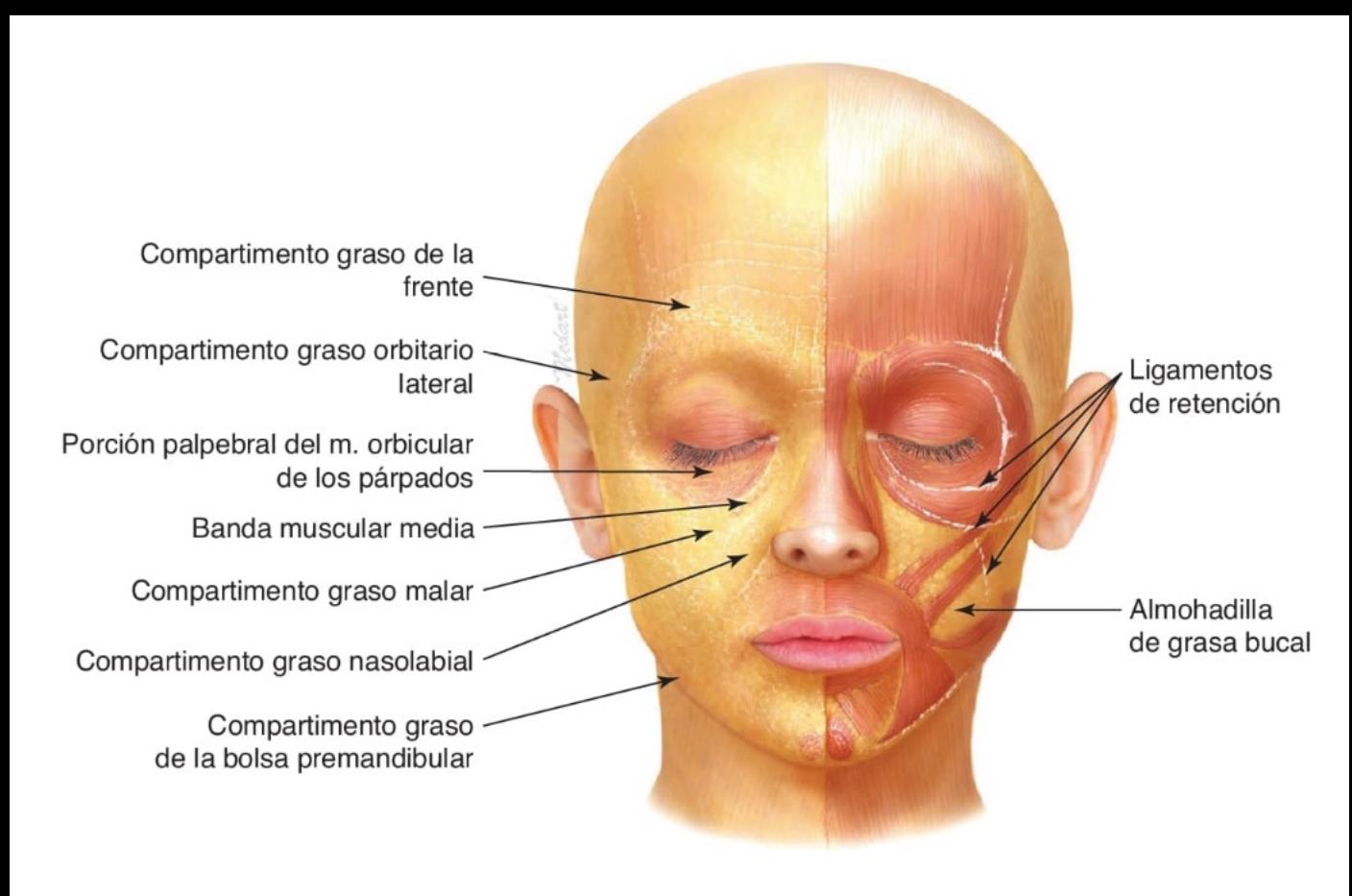
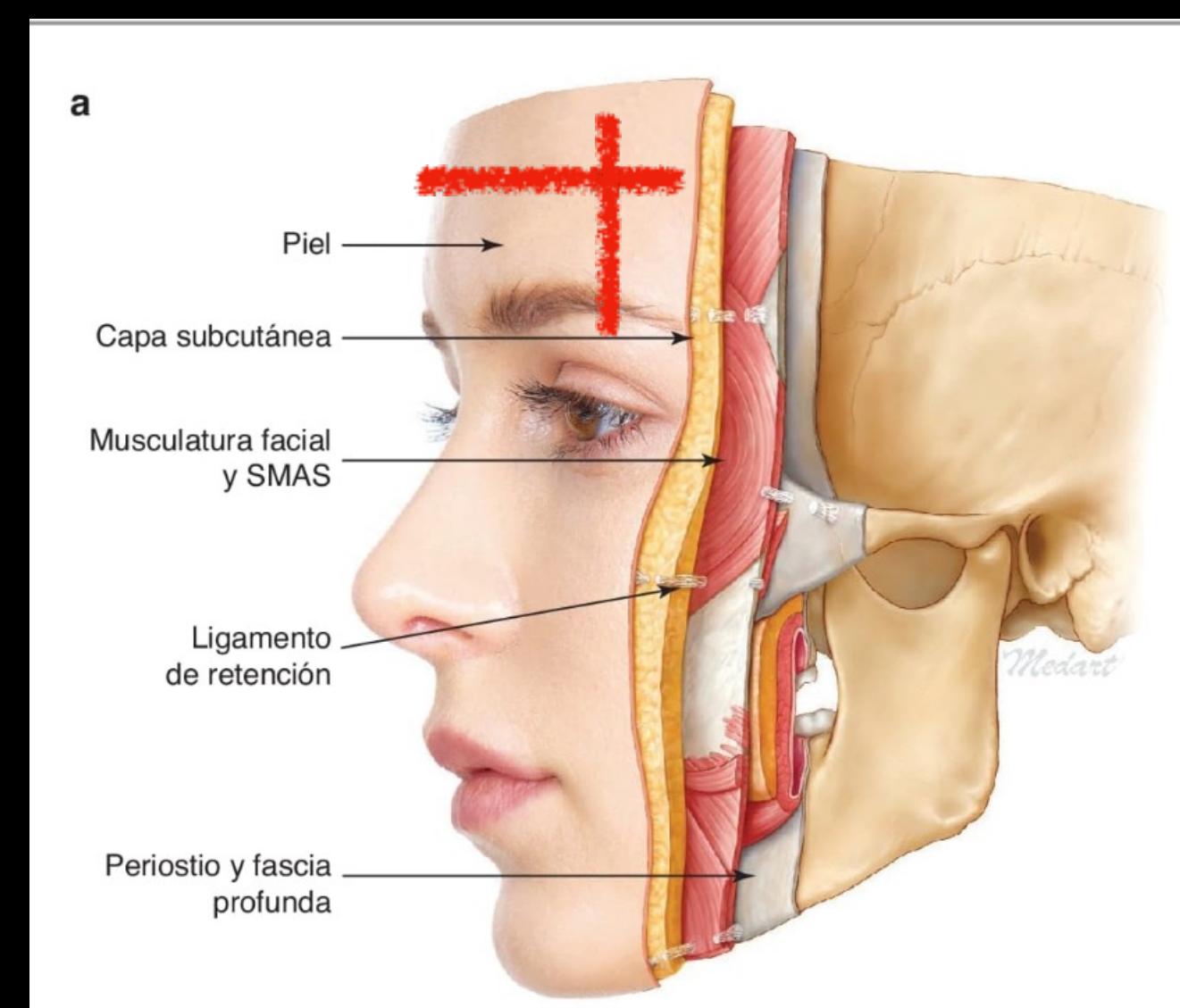
- Compartimientos grasos superficiales
- SMAS
- Compartimientos grasos profundos

ANATOMÍA CLÍNICA DE LA CARA PARA INYECCIONES DE RELLENO Y TOXINA BOTULÍNICA

PAUTAS ANATÓMICAS NOVEDOSAS

HEE-JIN KIM
KYLE K. SEO
HONG-KI LEE
JI-SOO KIM
KWAN-HYUN YOUNG

2025



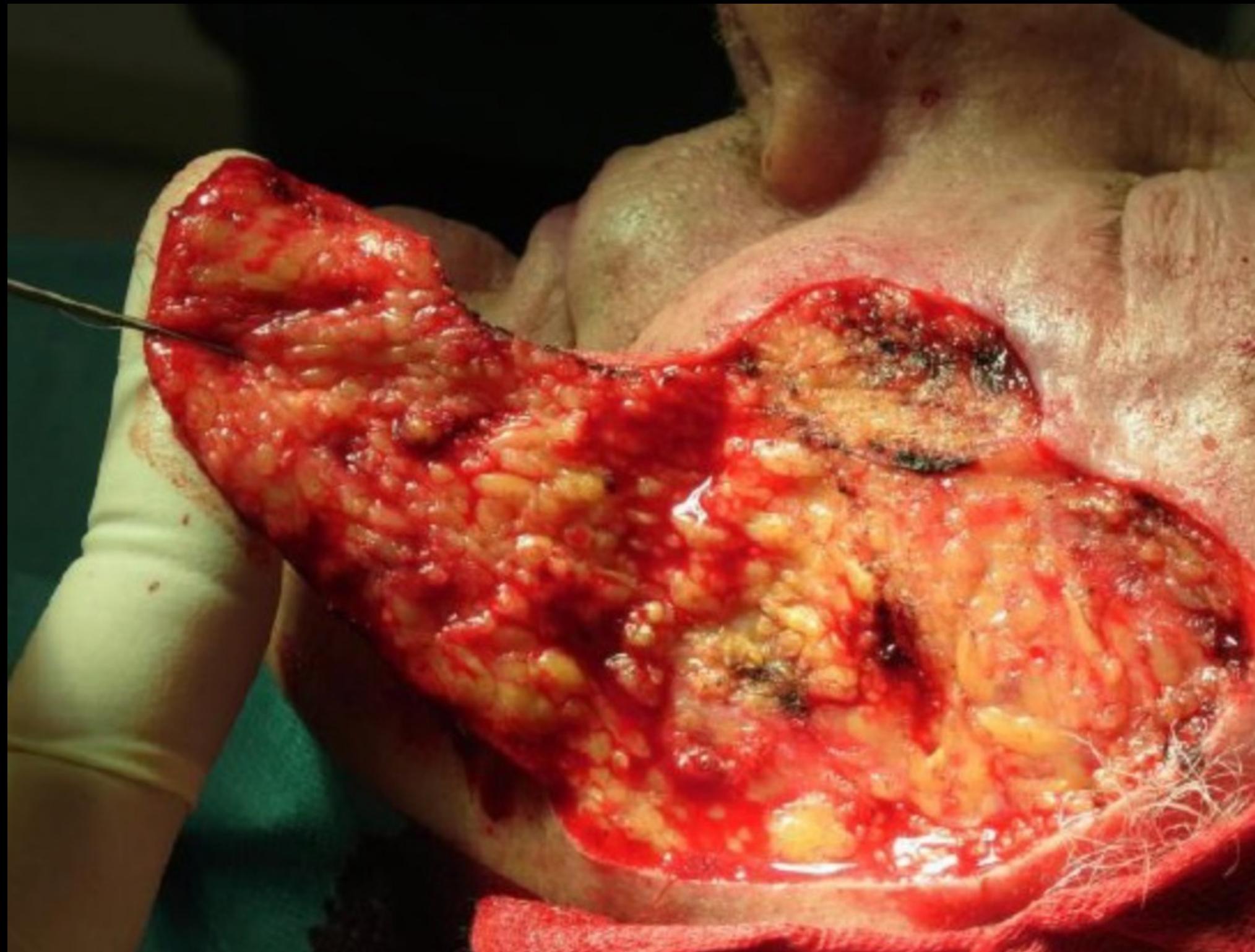
Generalidades de la apariencia ultrasonográfica normal de los tejidos faciales

- Piel
- Grasa superficial
- No periorificial o Tipo I (adipocitos blancos voluminosos)
- Periorificial o Tipo II (adipocitos maduros)
- Músculos
- Grasa profunda

Grasa subcutánea superficial

No periorificial o Tipo I

→ HIPOECOICA



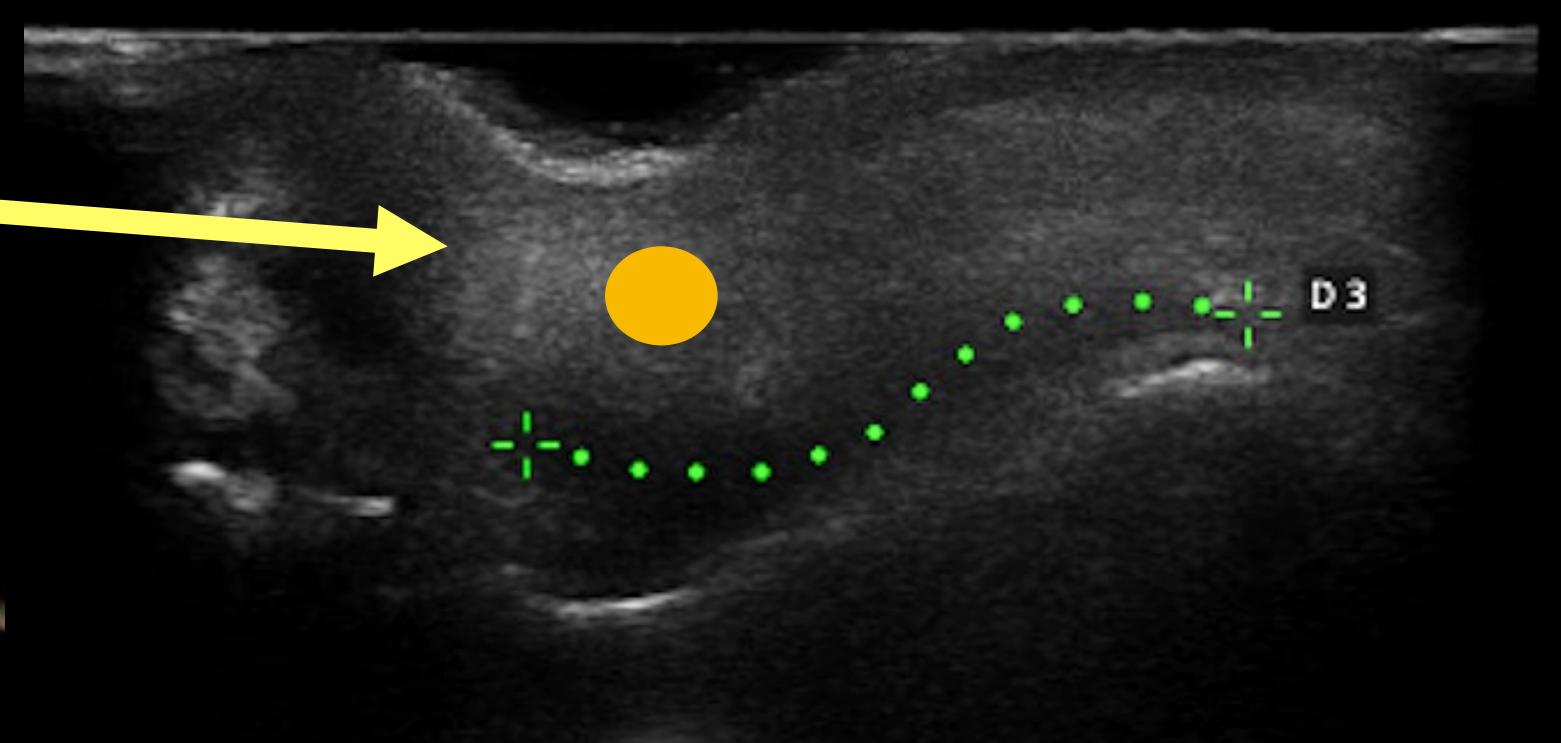
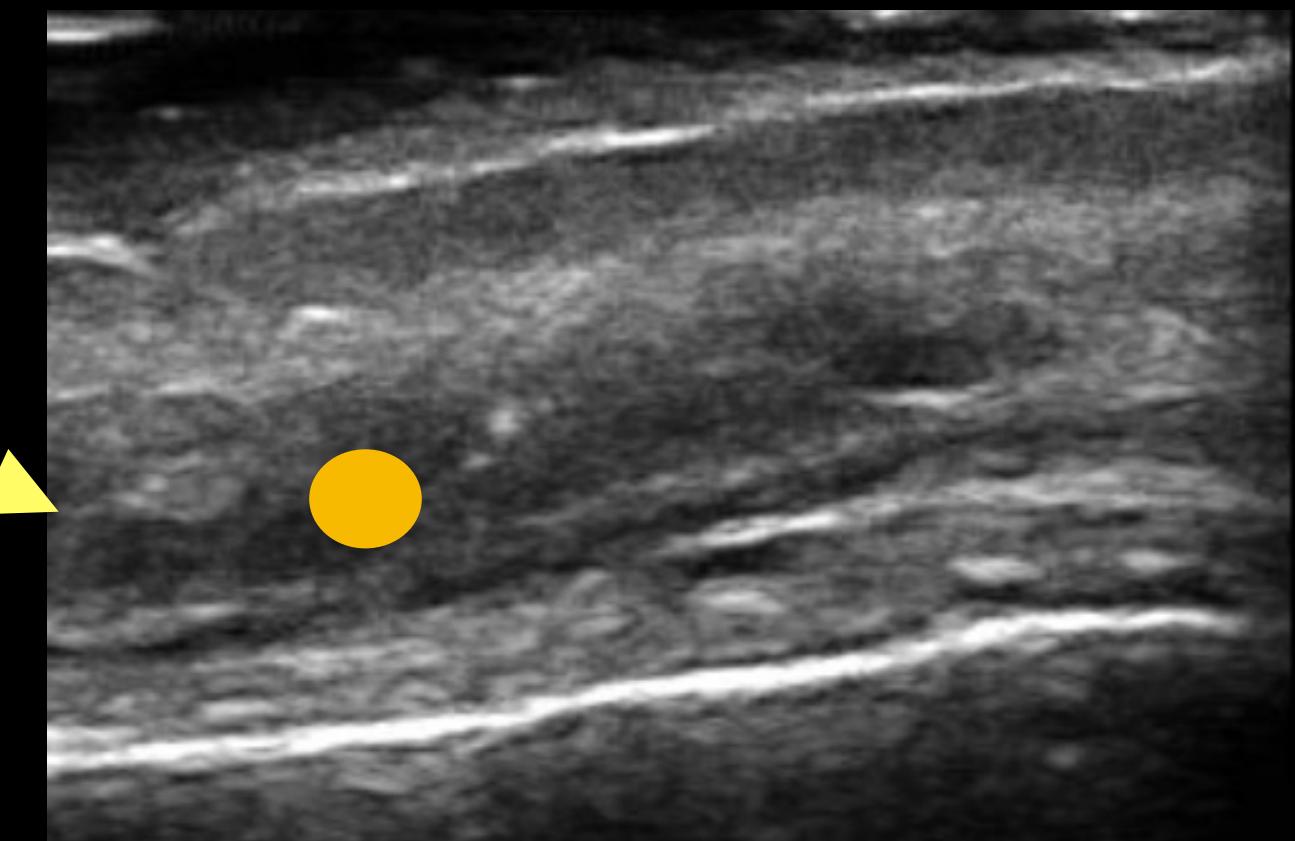
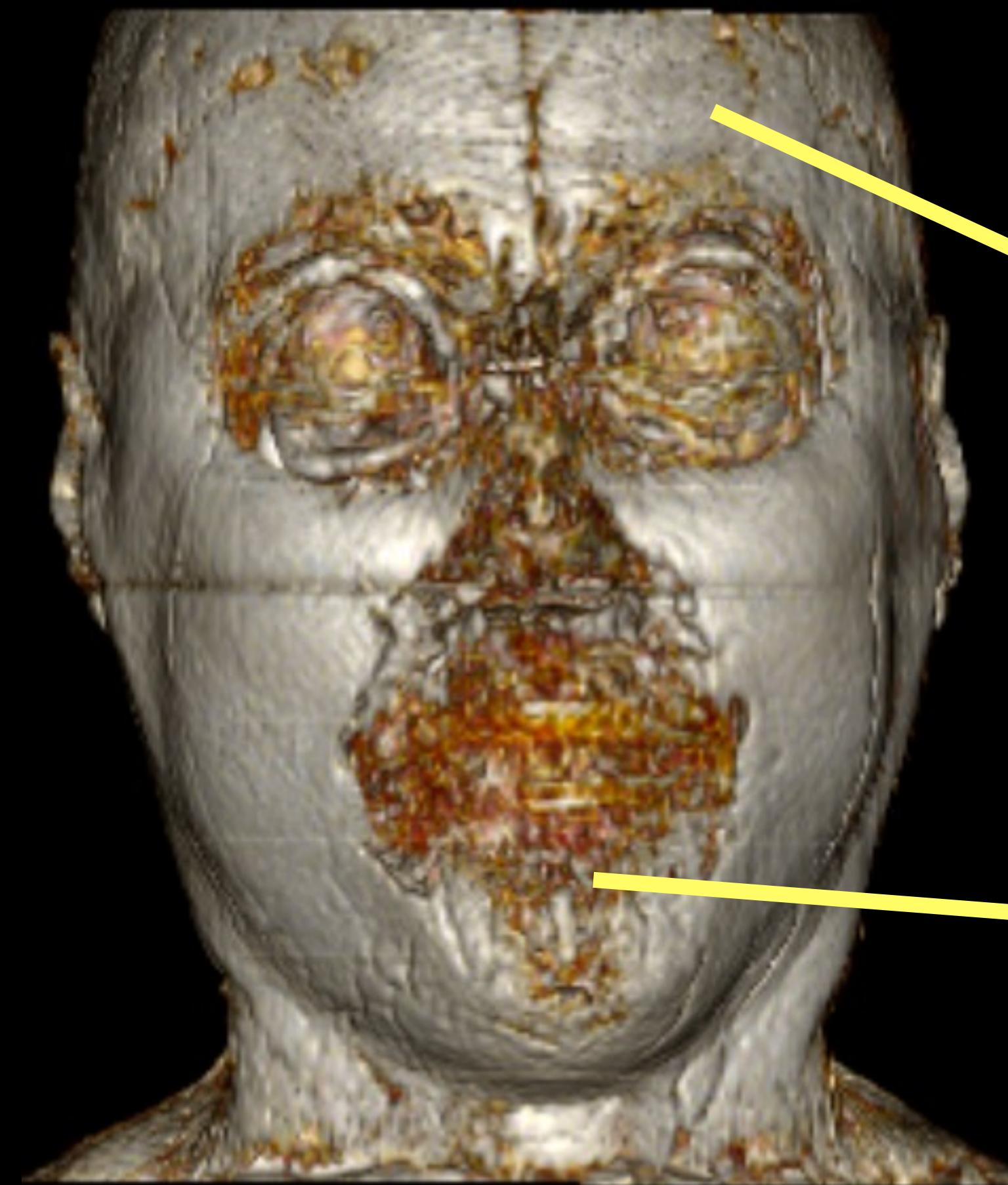
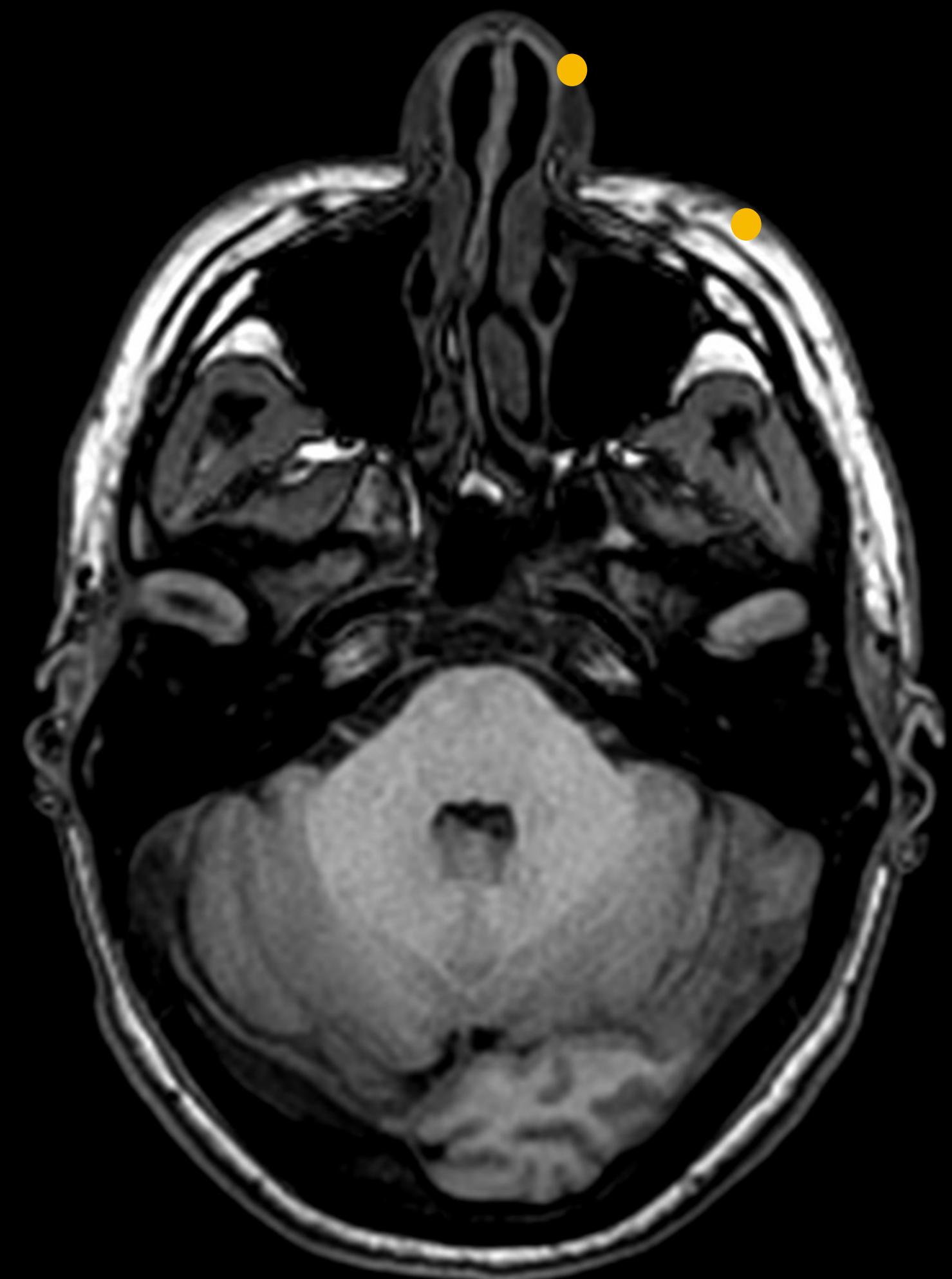
Periorificial o Tipo II

HIPERECHOICA ←

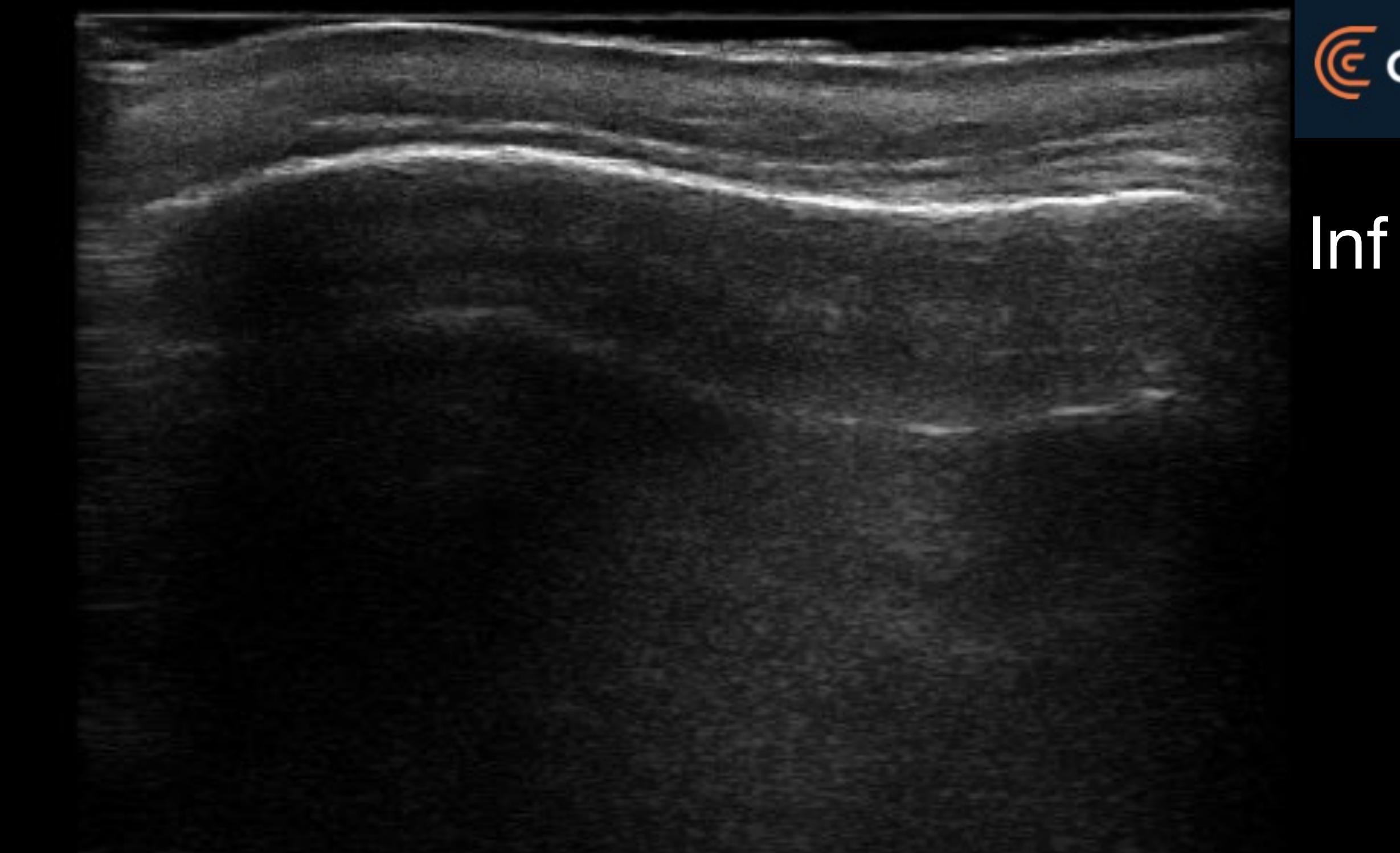


Adherencias más laxas/ móvil

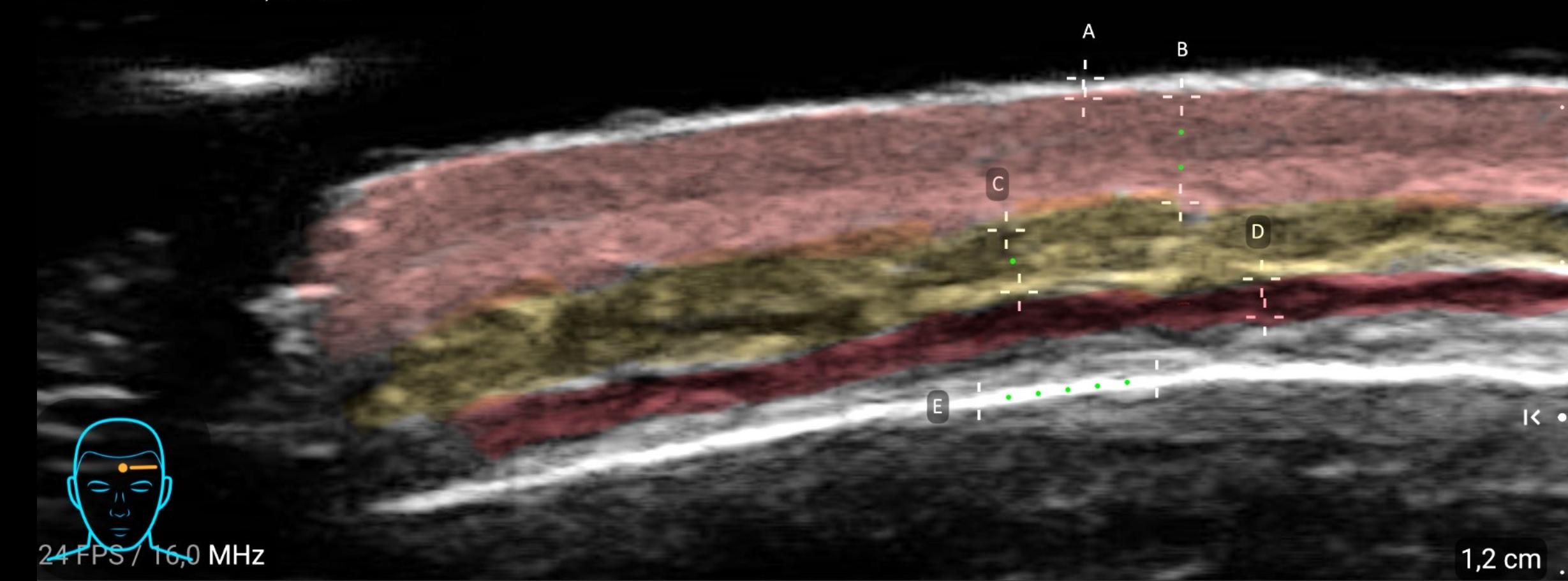
Adherencias más fuertes/ menos móvil

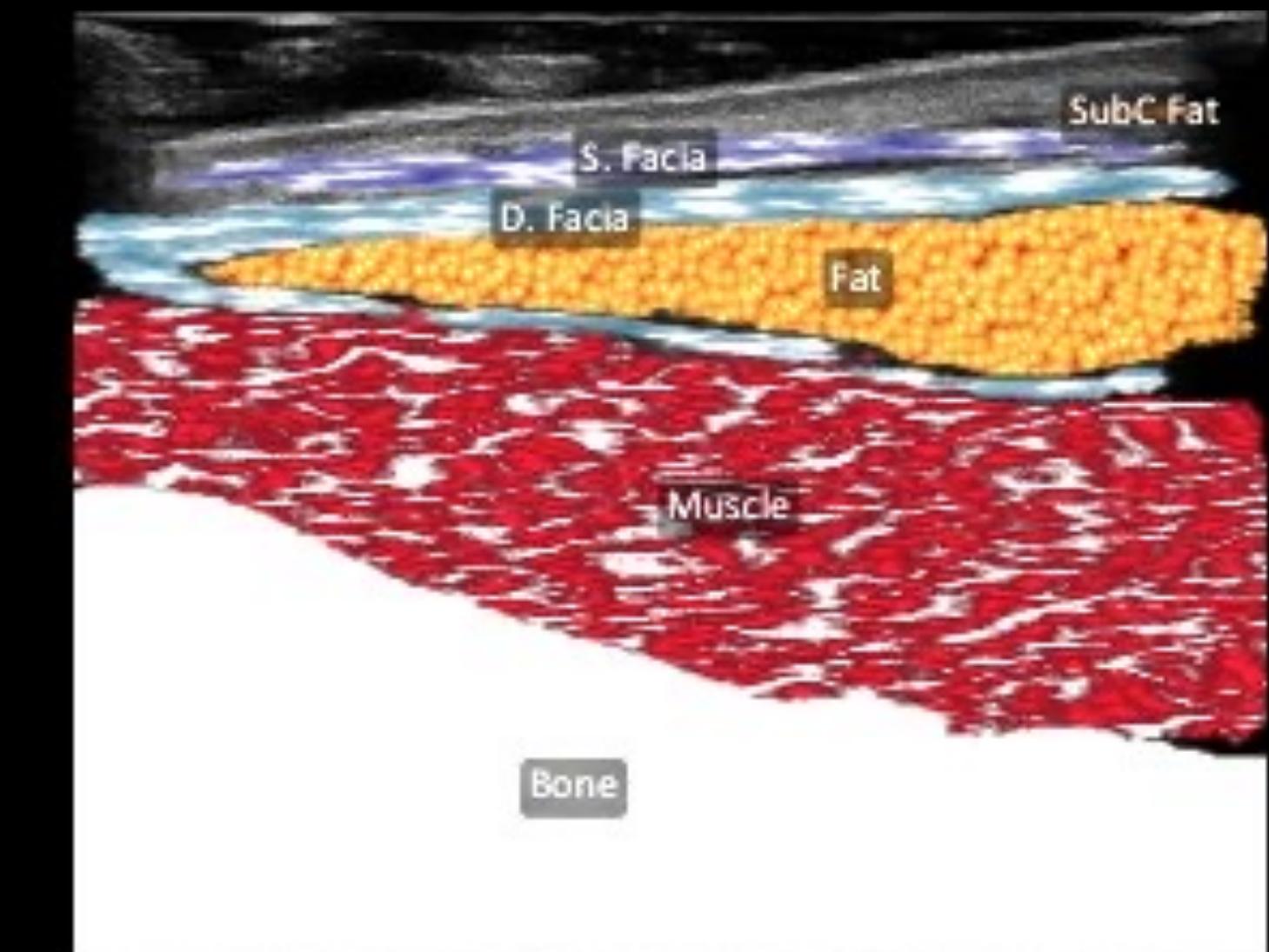


Sup

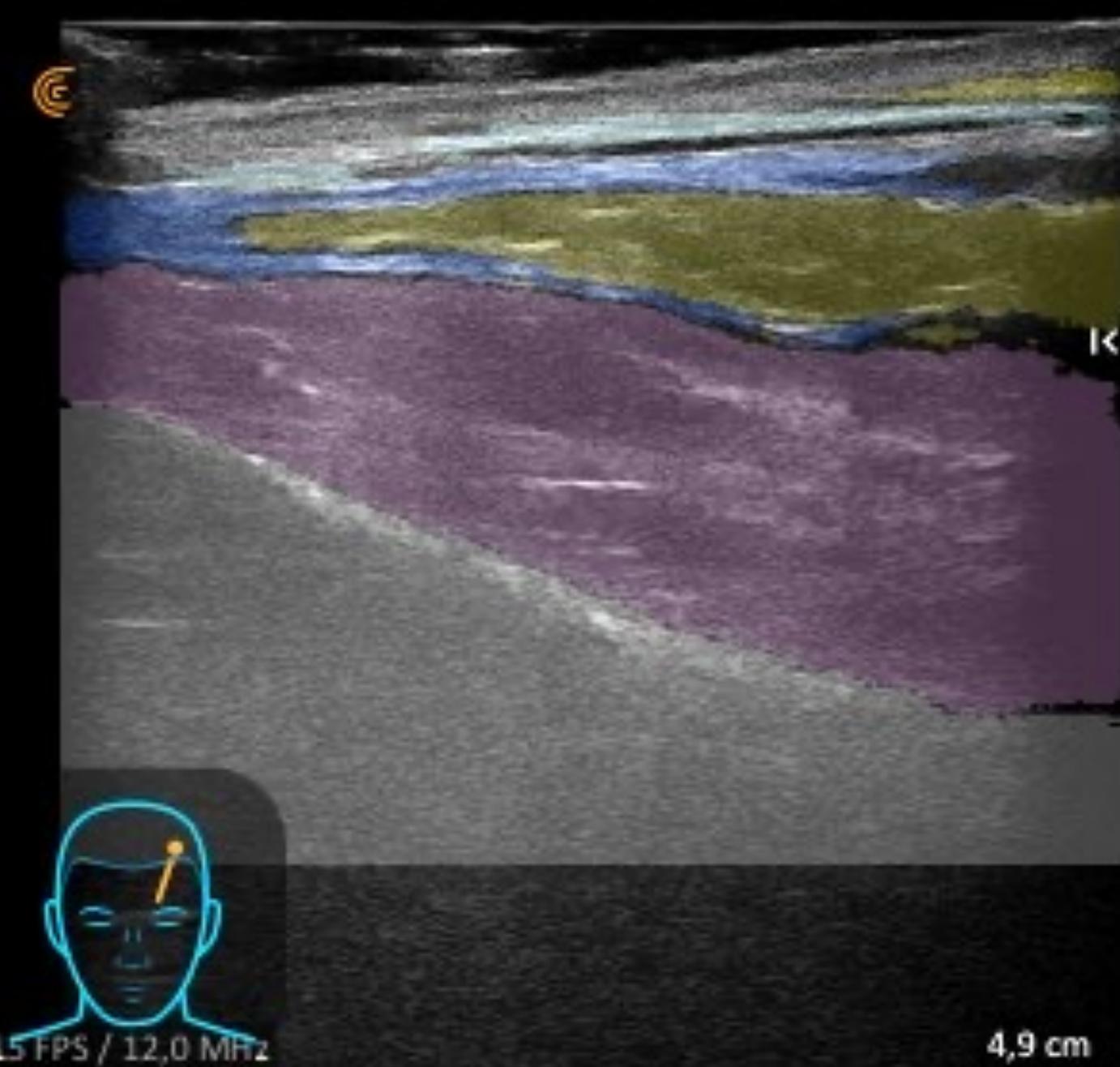


D 9
A 0,2612 mm
B 1,367 mm
C 0,8155 mm
D 0,4954 mm
E 2,314 mm

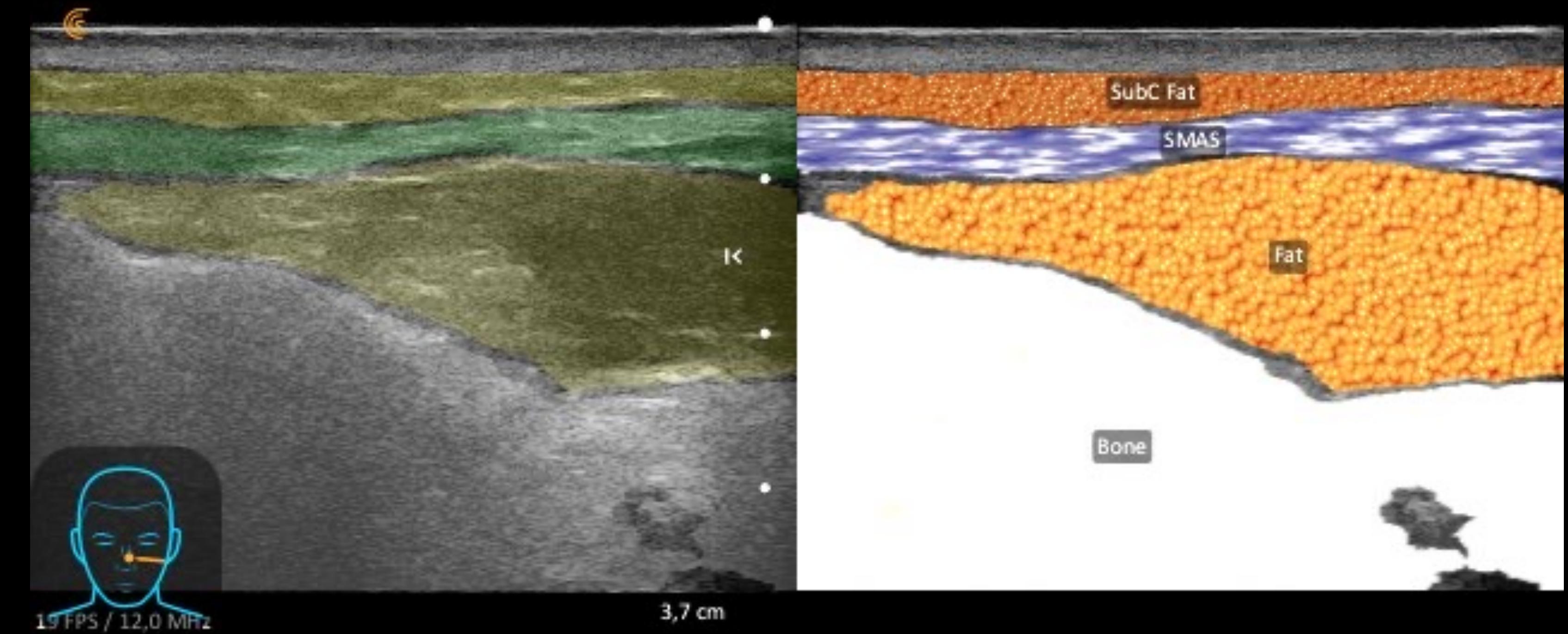
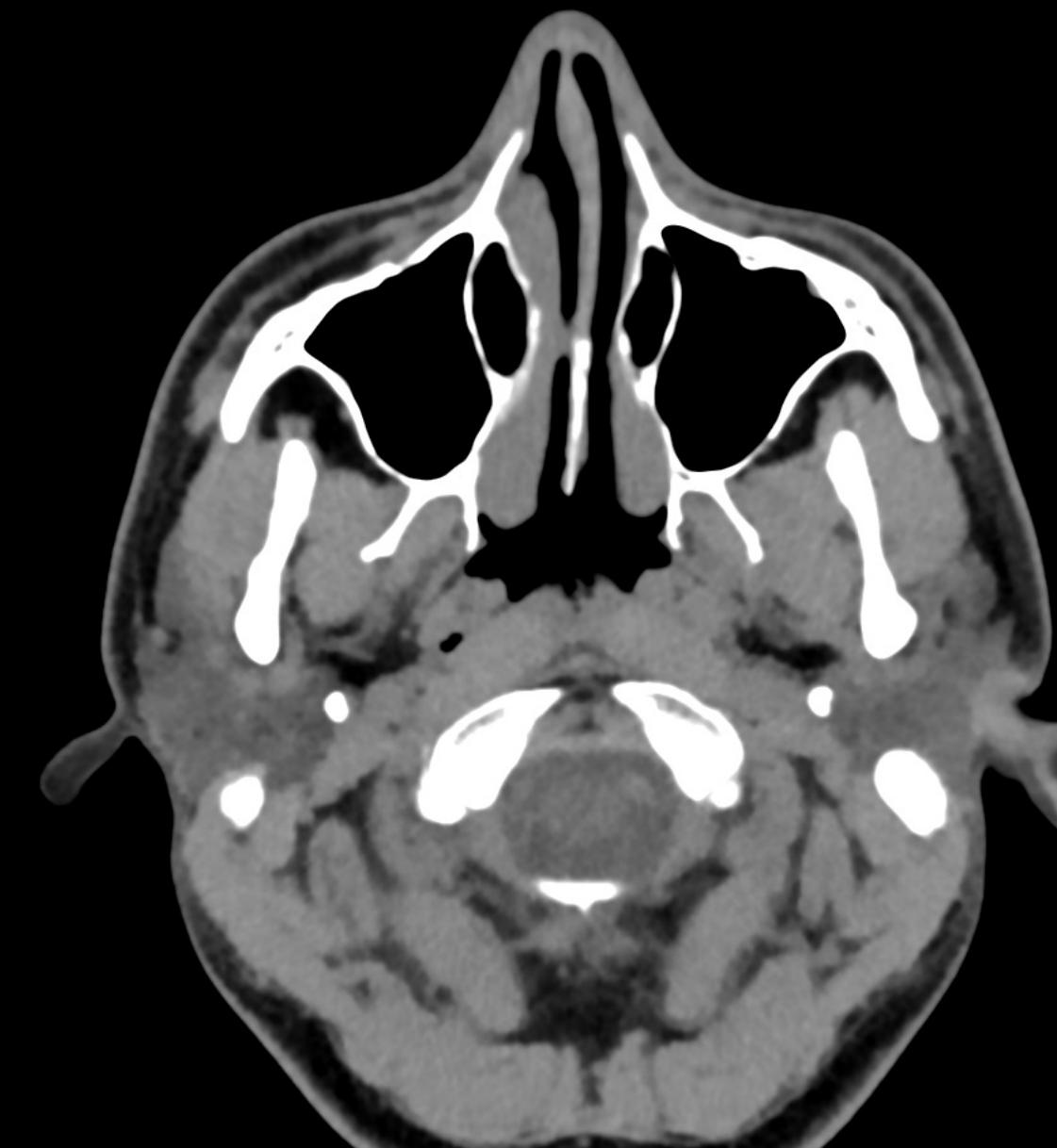




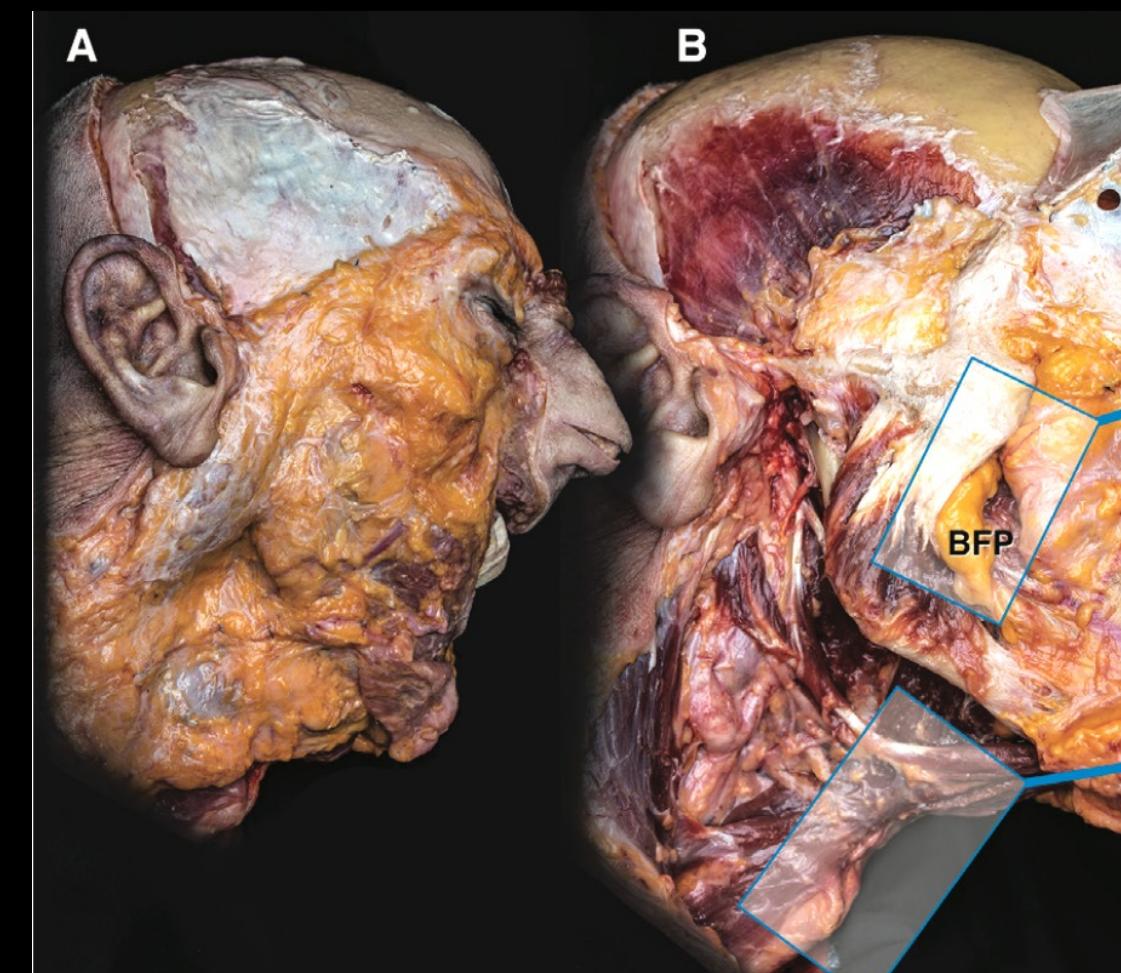
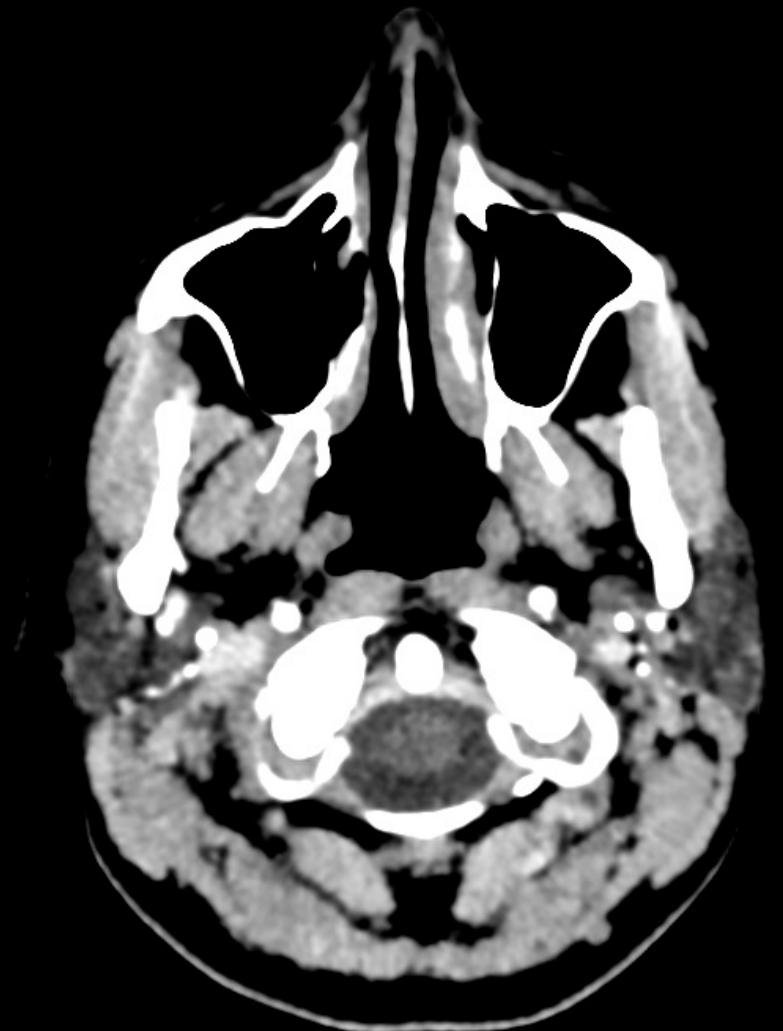
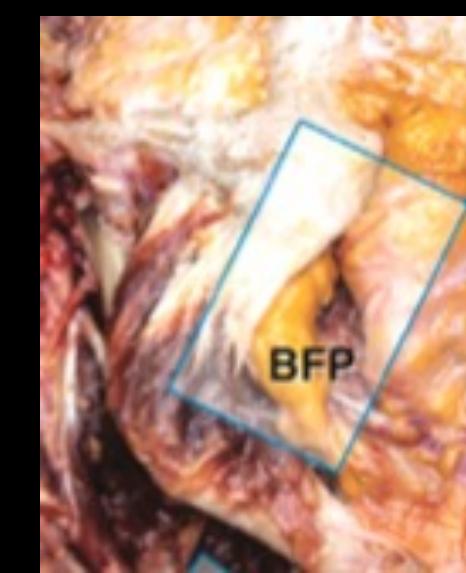
Corte longitudinal



Corte axial o transversal



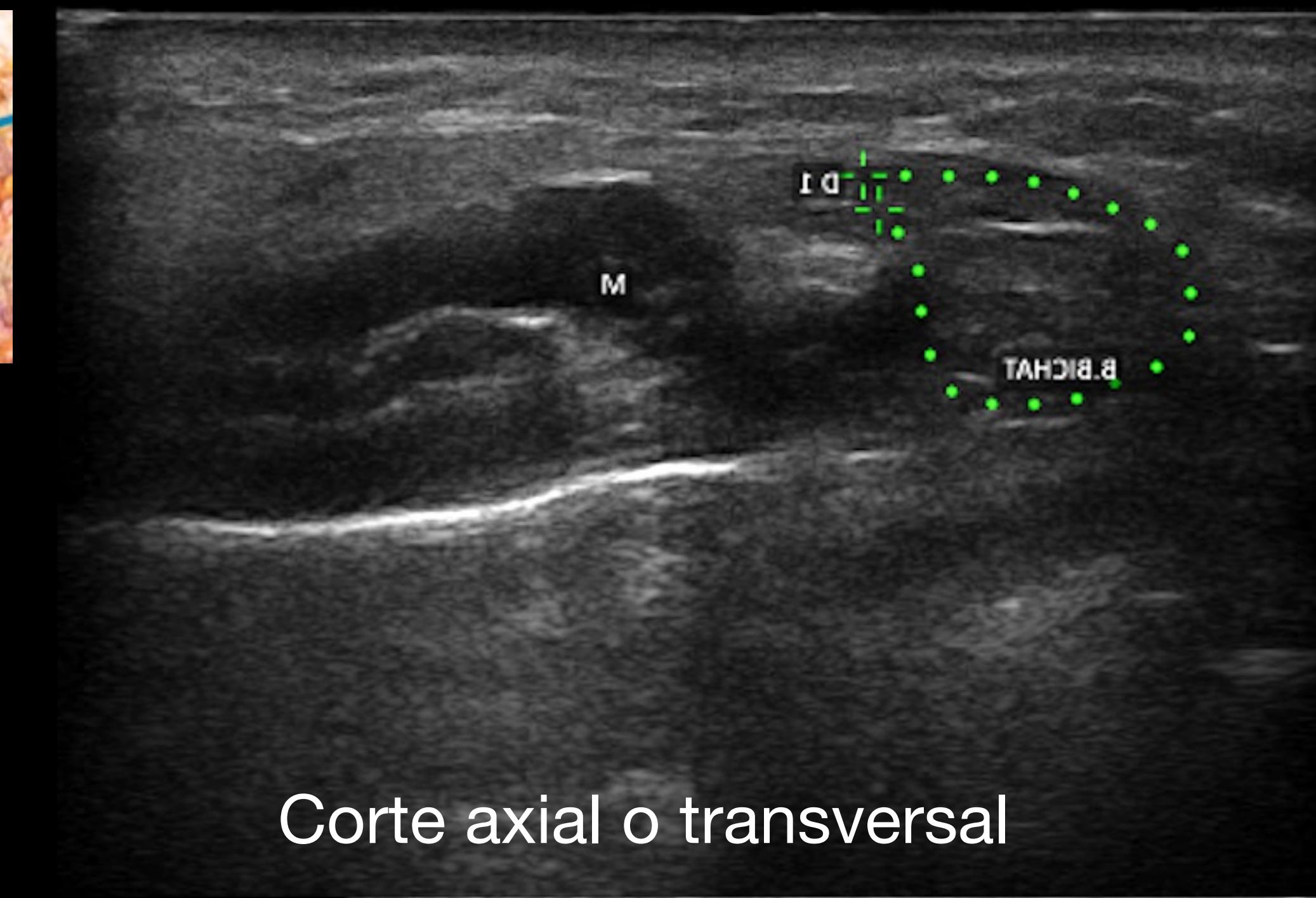
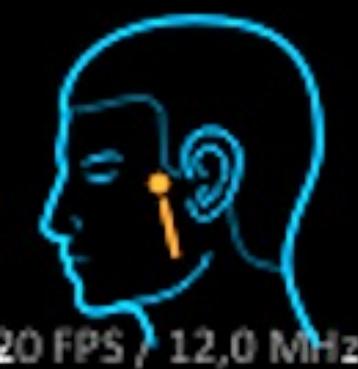
Corte axial o transversal



"The Deep Fascia of the Head and Neck Revisited:
Relationship With the Facial Nerve and
Implications for Rhytidectomy"

Lennert Minelli^{1,2,3,4}, Berend van der Lei⁴, Bryan C. Mendelson¹
Plastic and Reconstructive Surgery. 2023 April; Online ahead of print.

(DOI: 10.1097/PRS.00000000000010556)

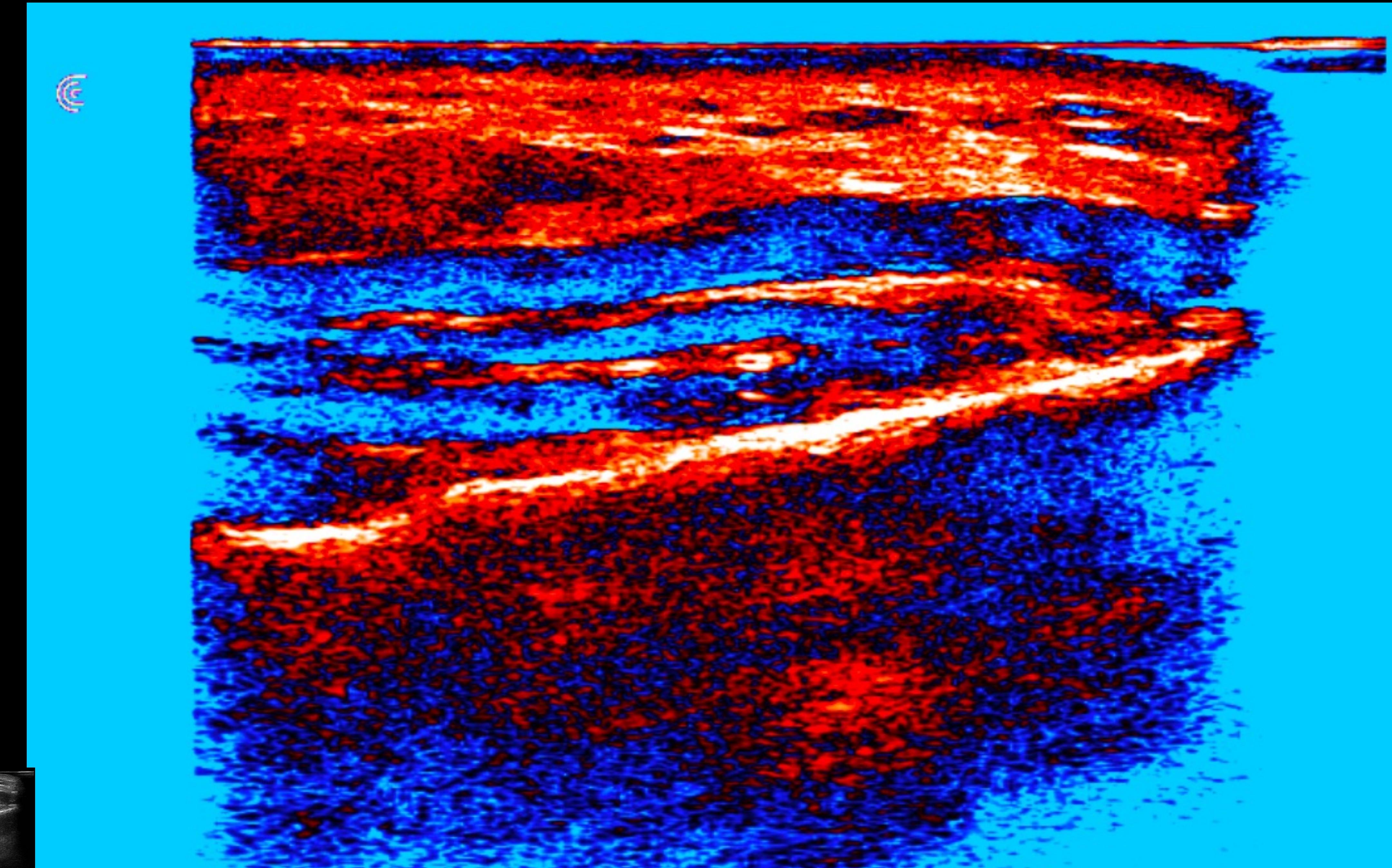


Corte axial o transversal



Corte longitudinal

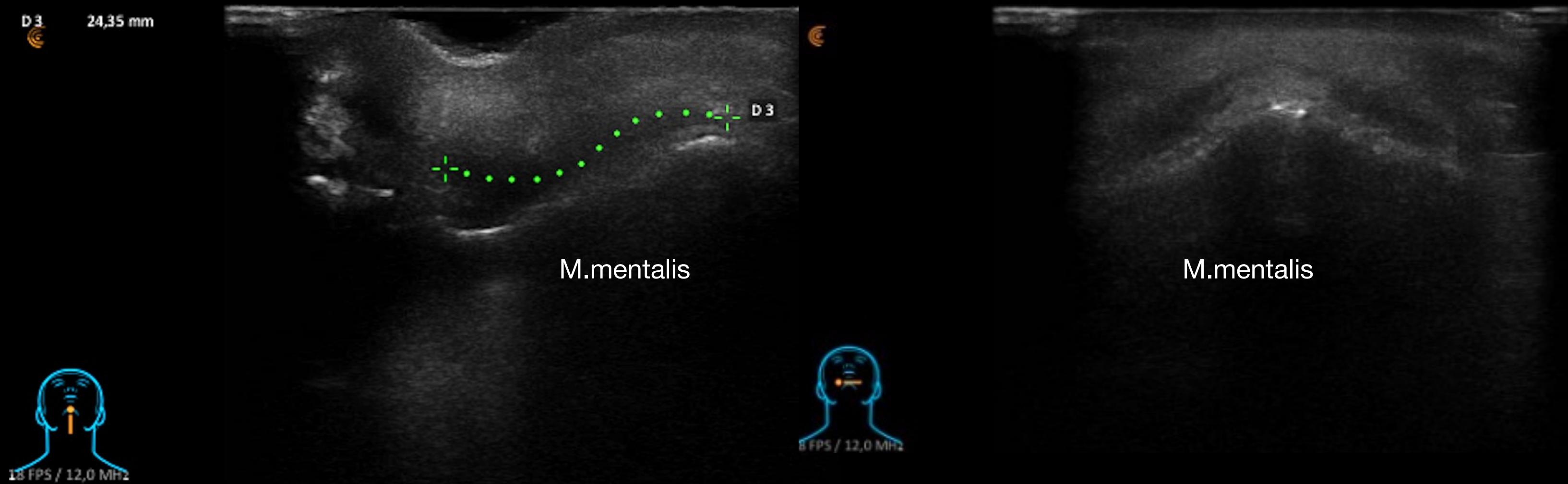
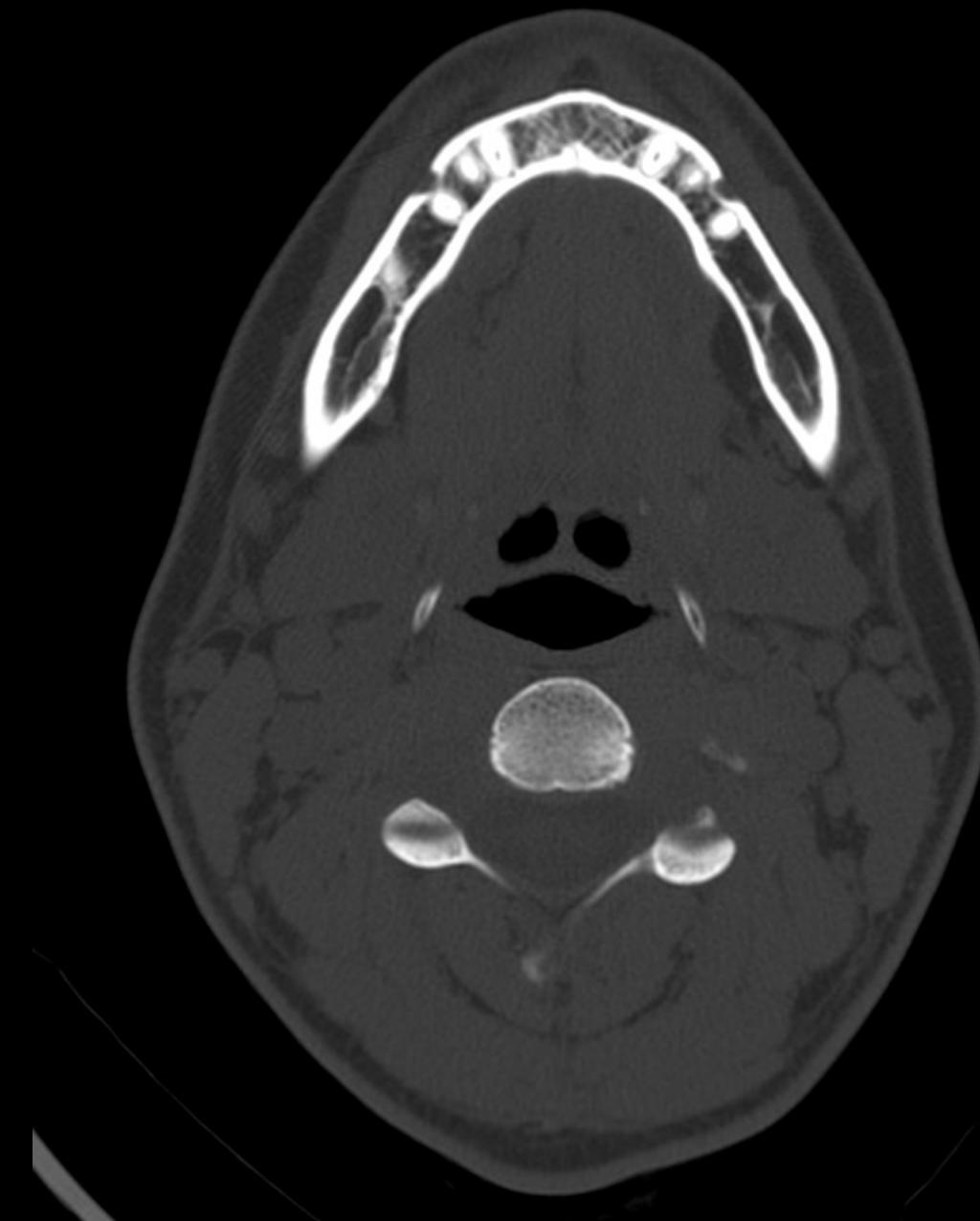
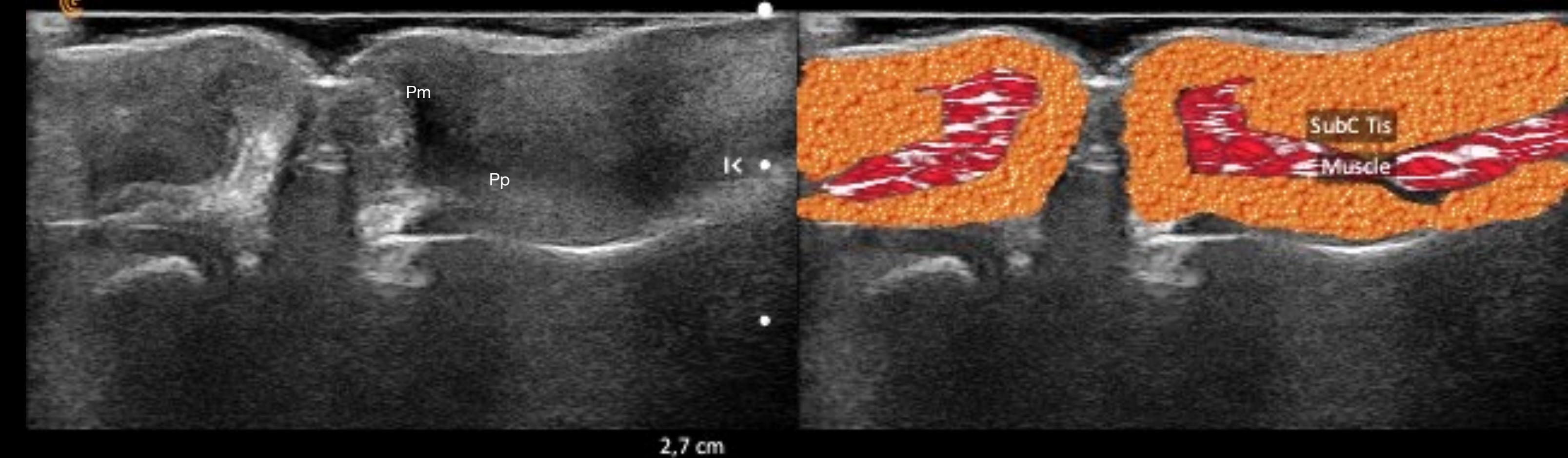
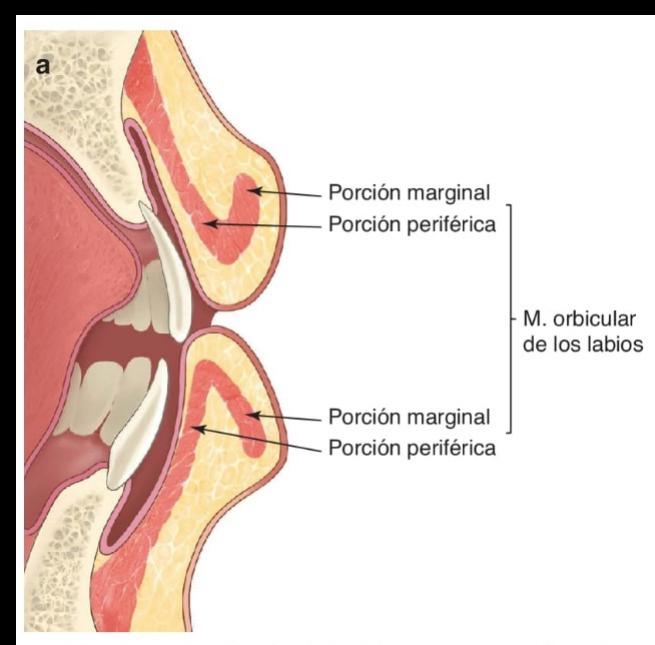
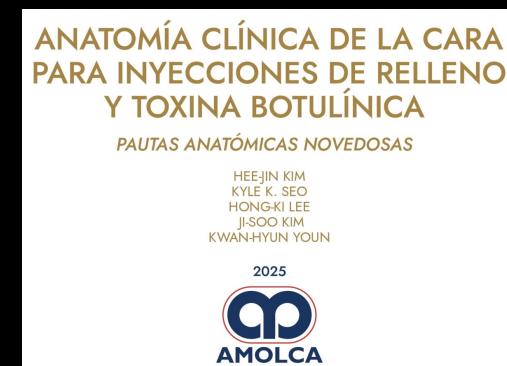




Corte axial o transversal

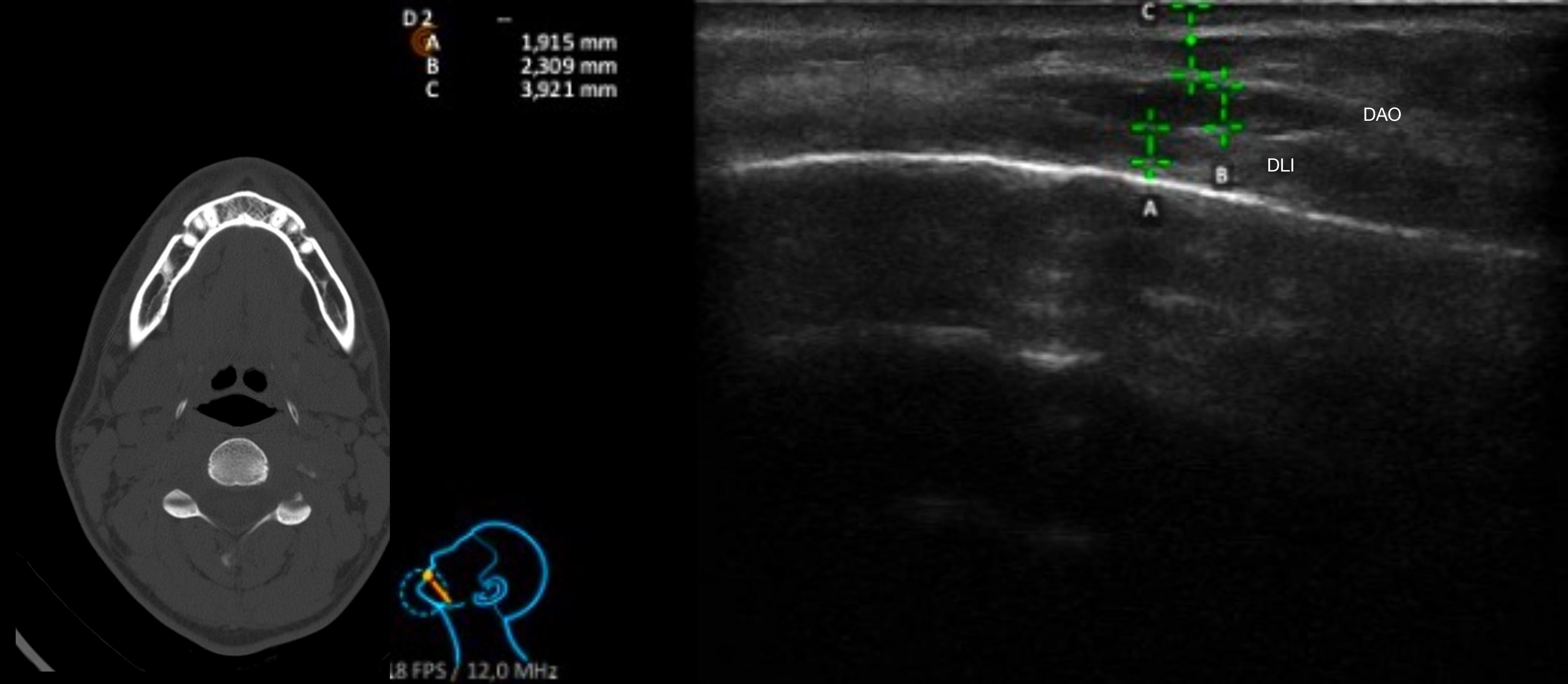
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Corte axial o transversal.



Corte longitudinal o sagital.

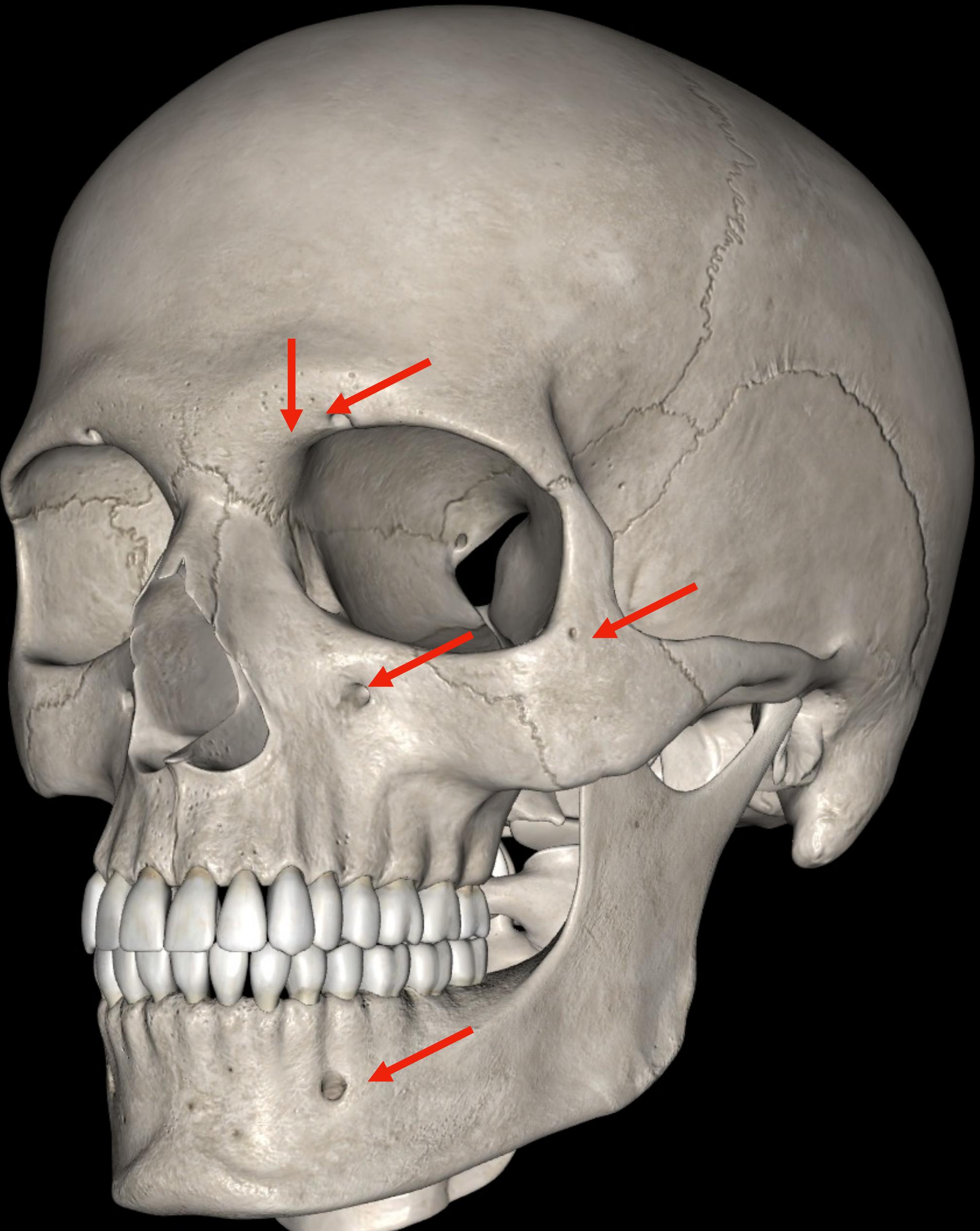
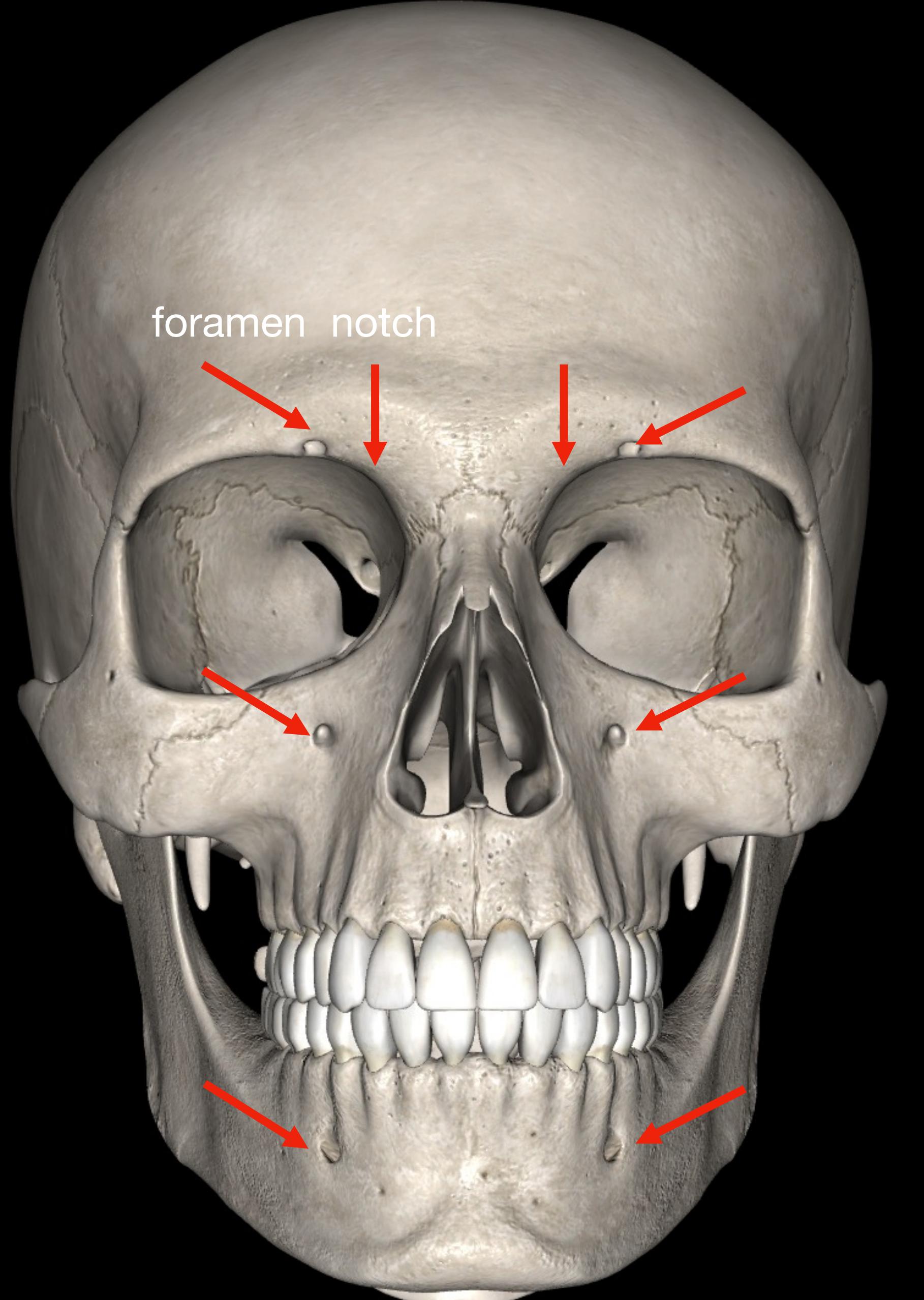
Corte axial o transversal.



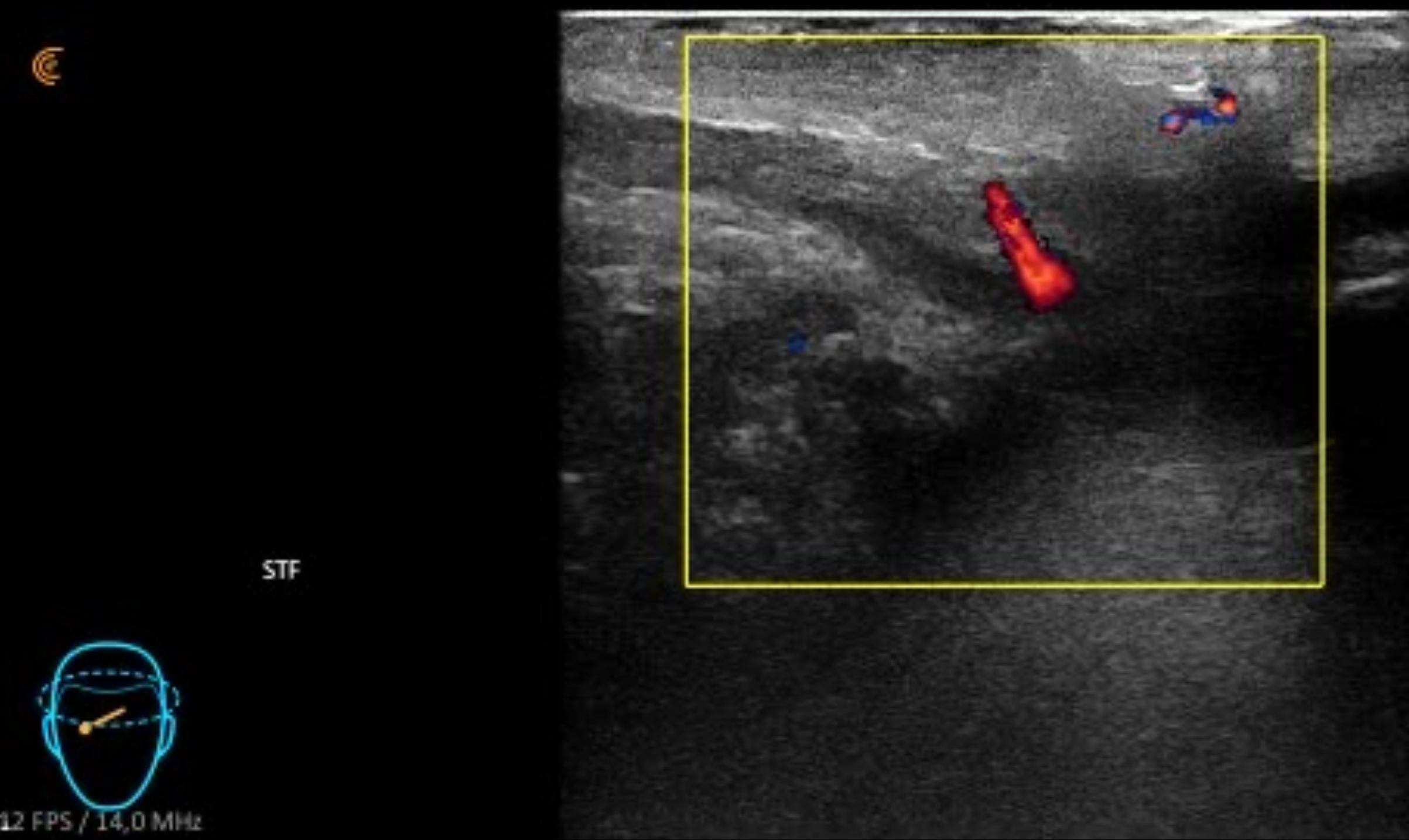
Corte axial o transversal.

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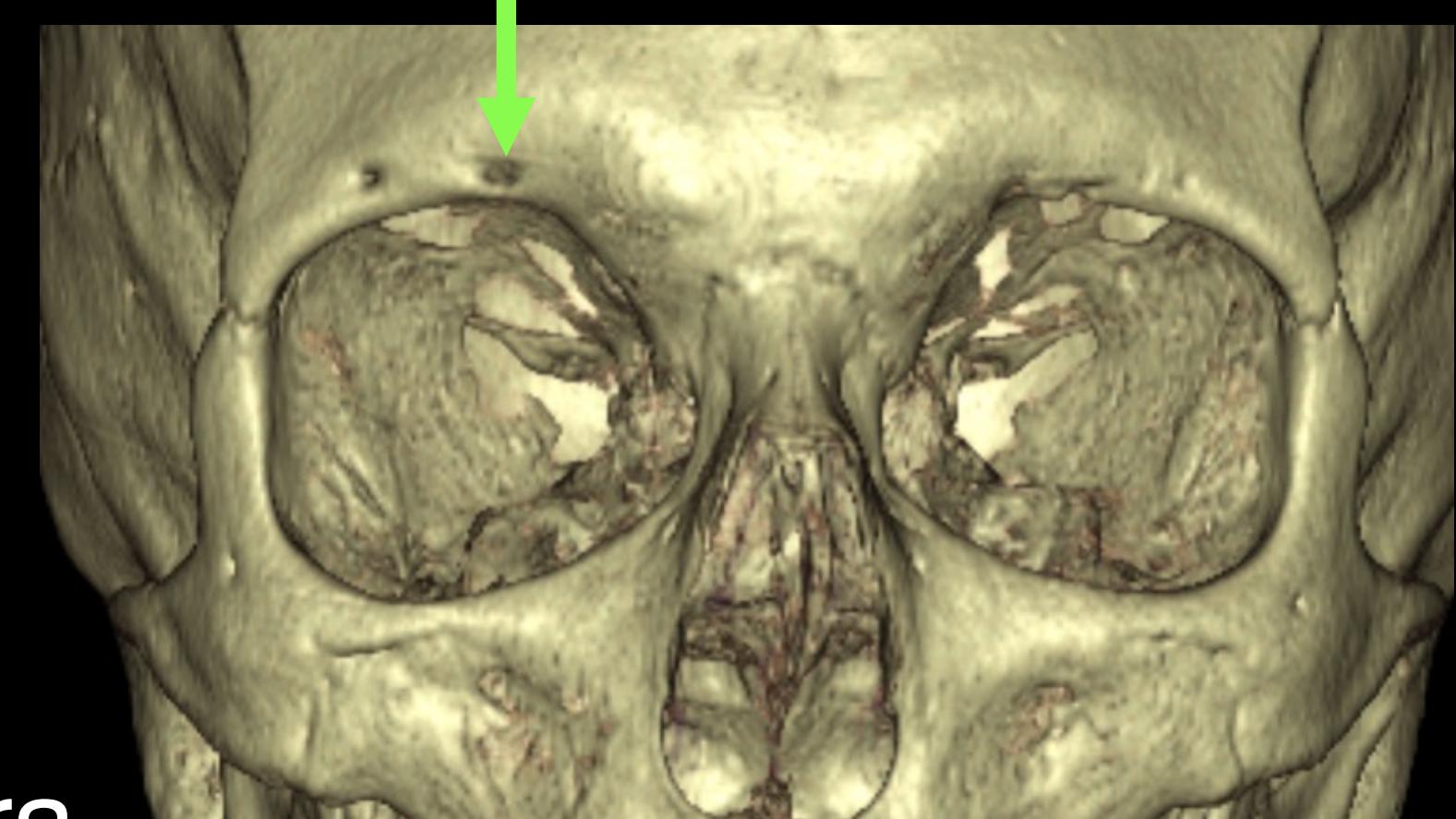
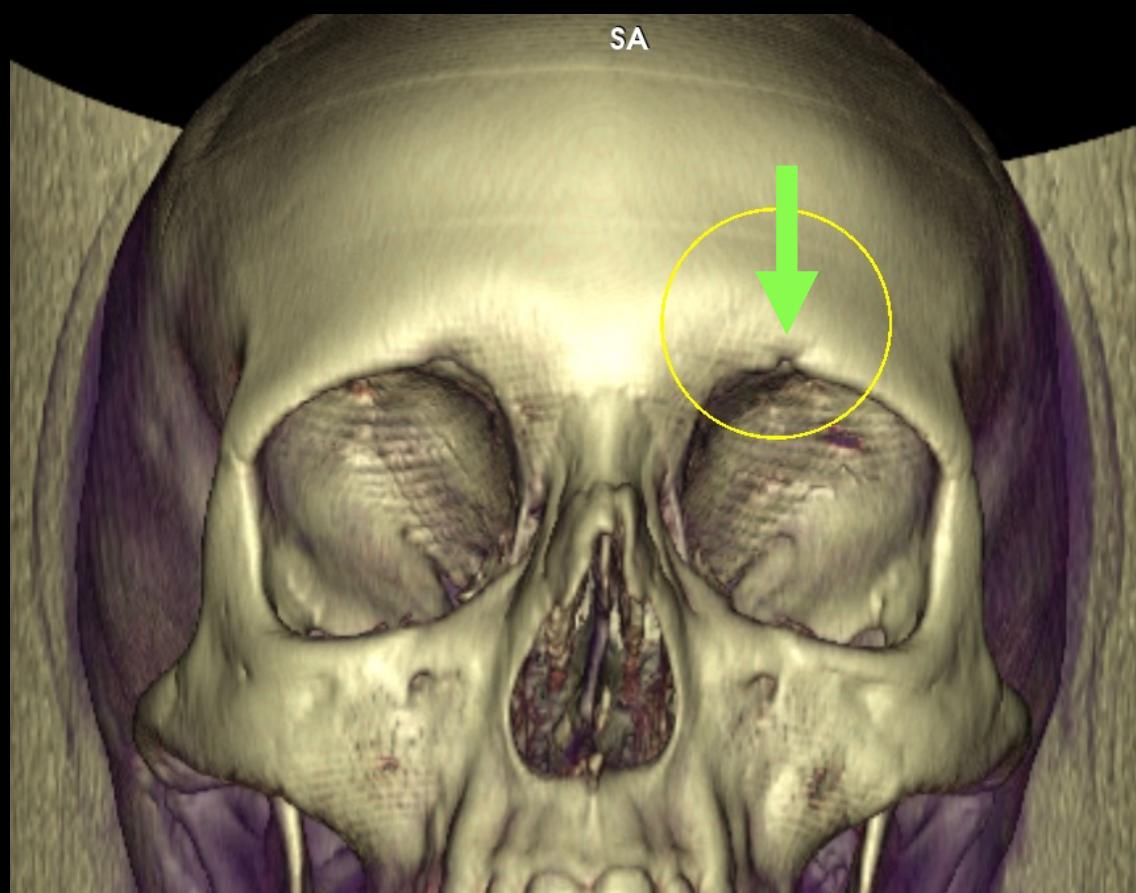
• Superficie ósea y forámenes



Foramen supraorbitario



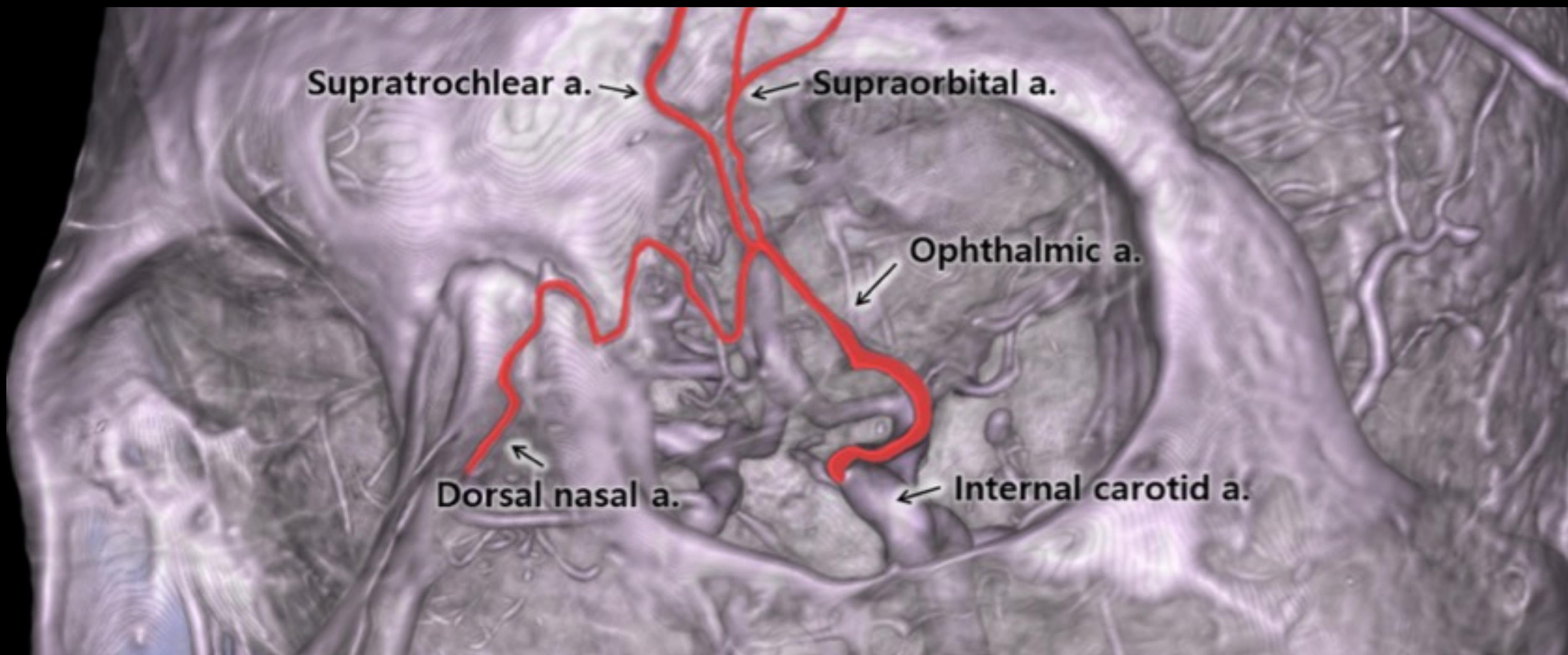
Foramen supratroclear



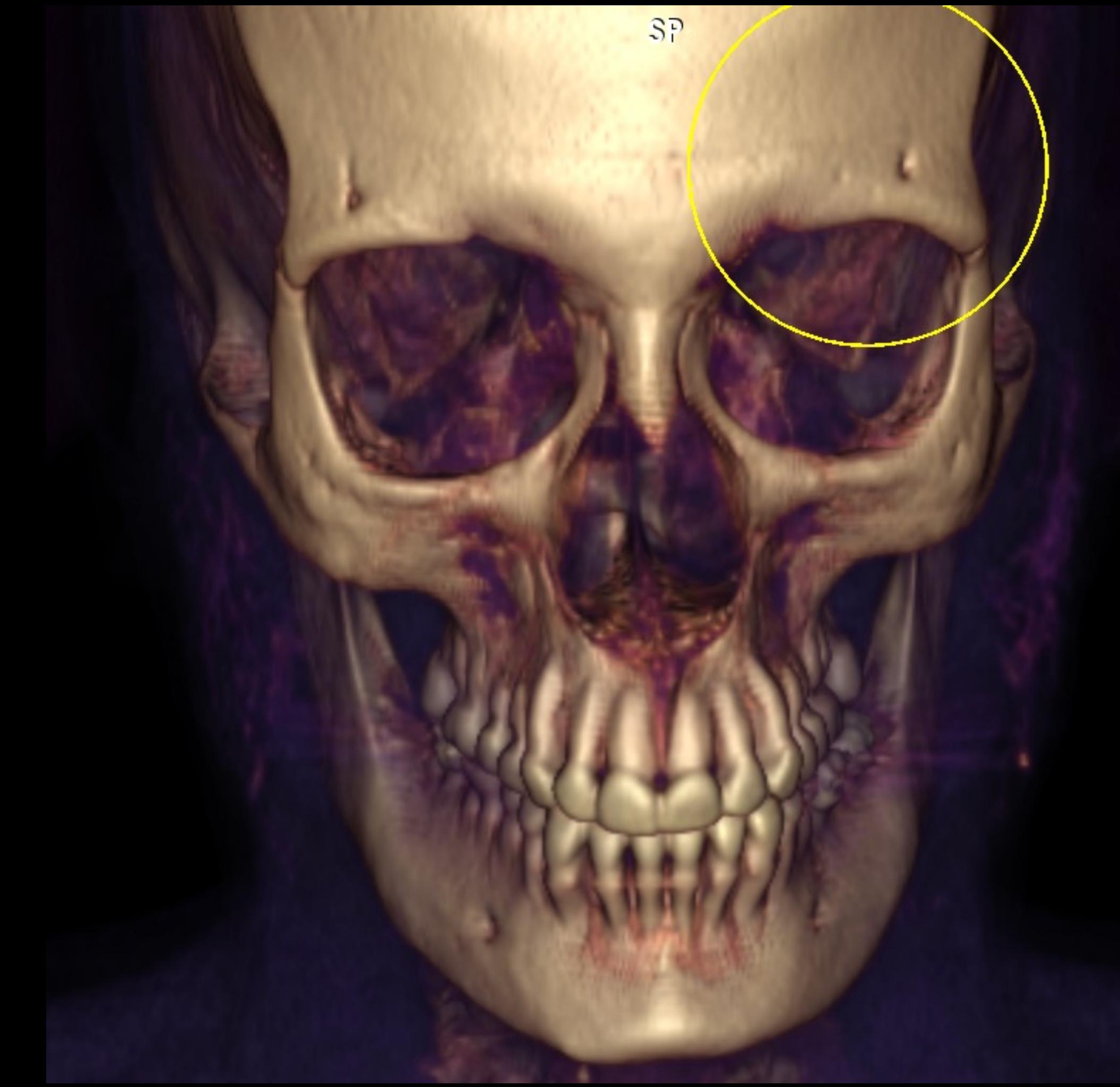
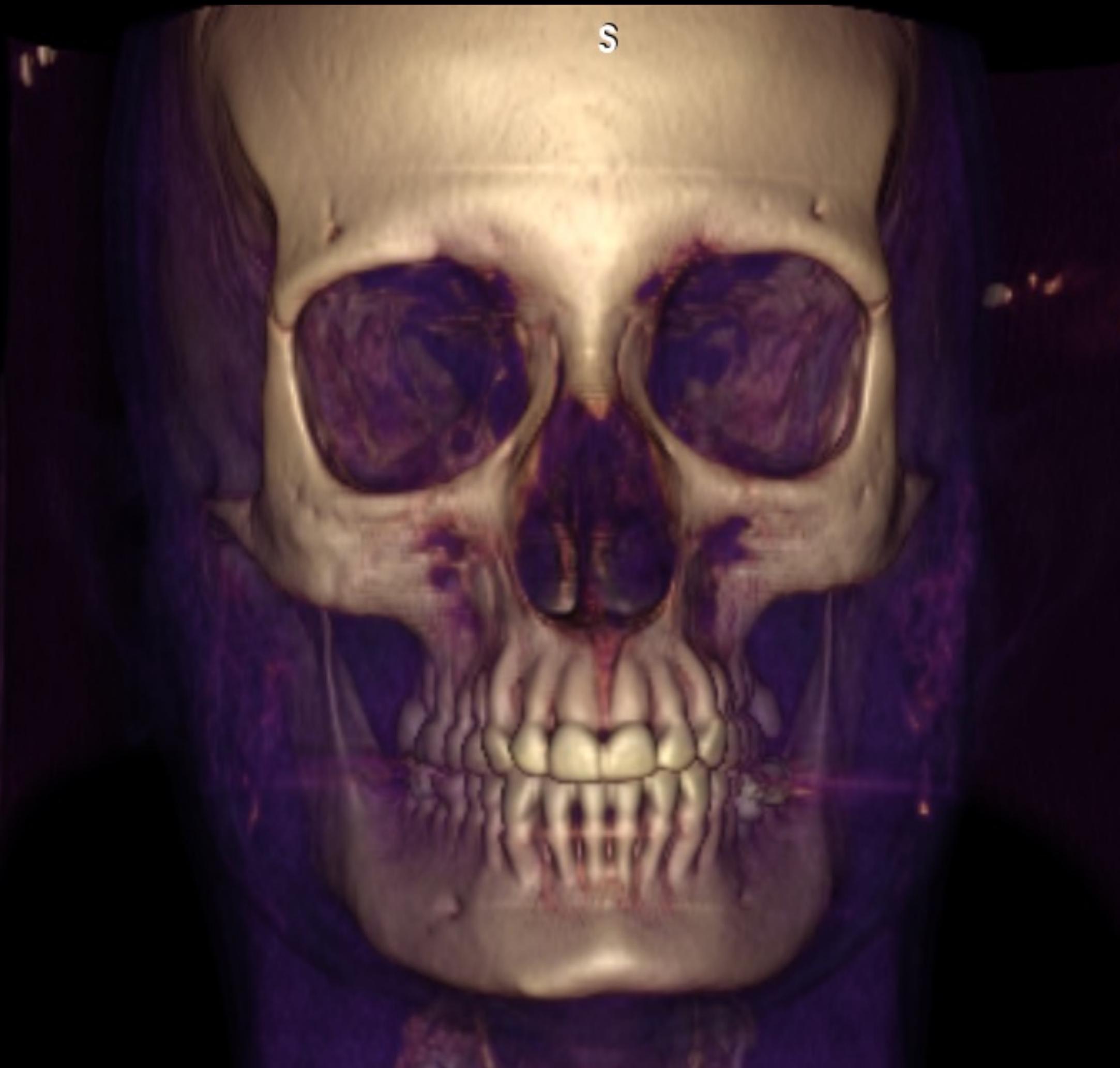
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Does injecting small amounts of fillers prevent the development of secondary blindness?

Kyu-Ho Yi MD, PhD^{1,2}  | Hyung-Jin Lee PhD³ | Woo-Ram Kim MD⁴ | Min Ho An MD⁵
Hyun-Jin Park PhD¹ | Hyewon Hu MFA¹ | Hee-Jin Kim DDS, PhD¹ 

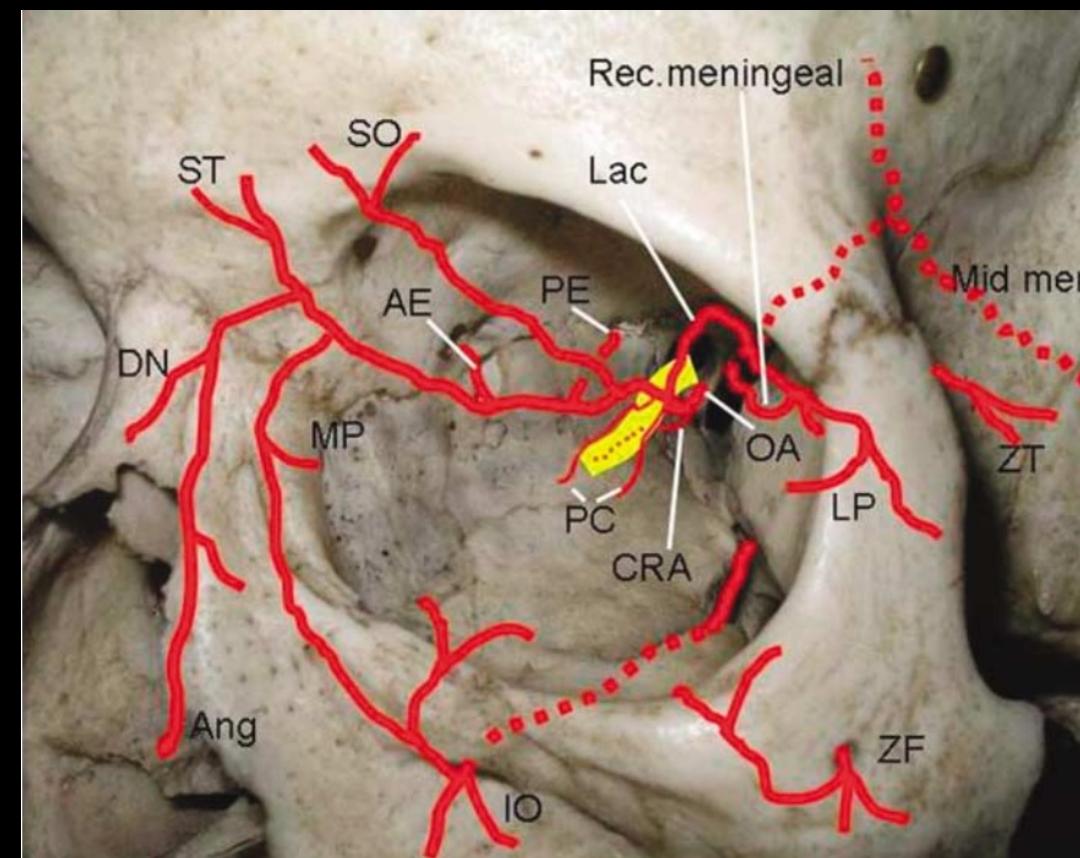


Foramen supraorbitario lateralizado

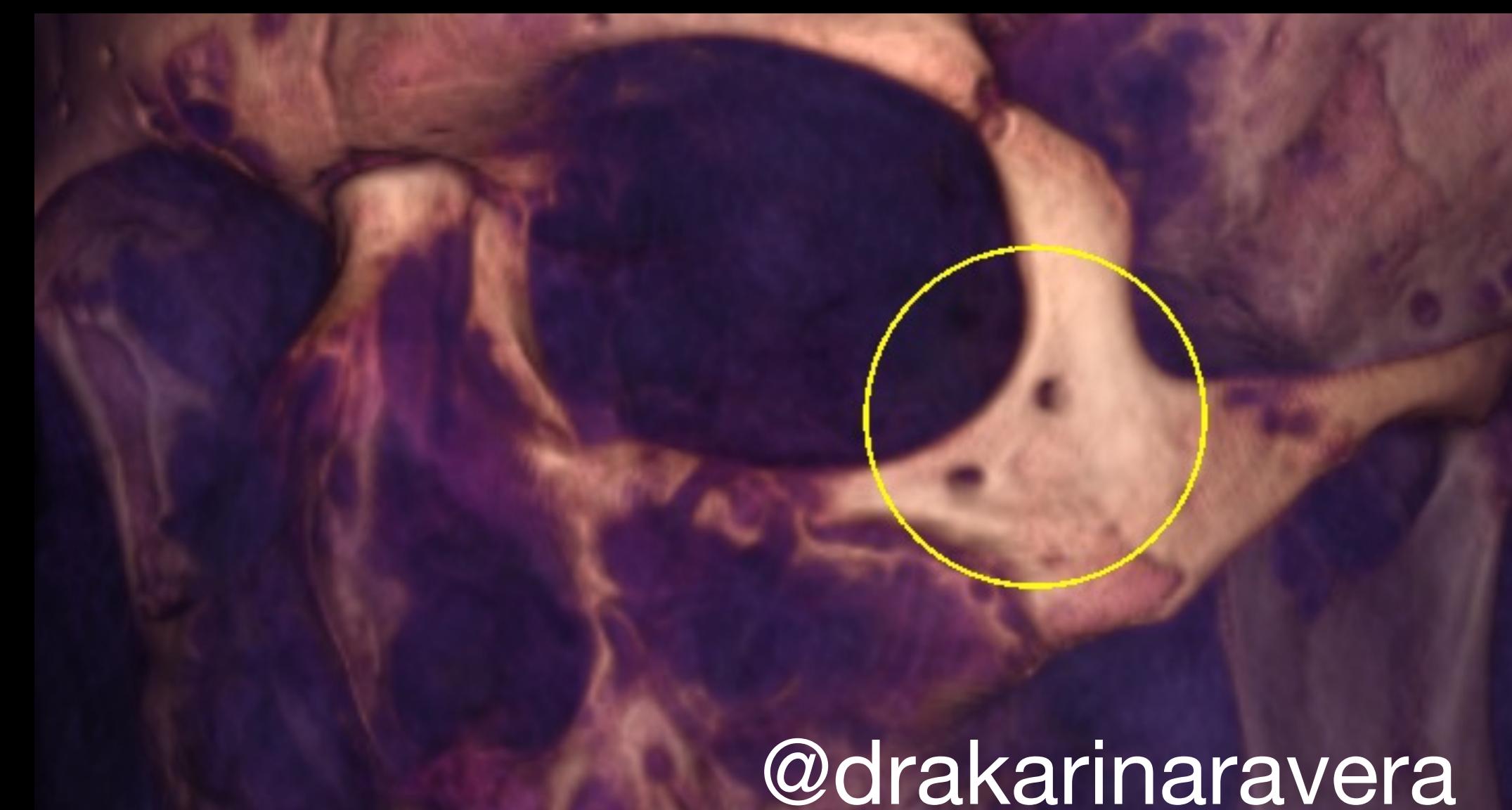


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Foramen cigomáticofacial



Rene C.
Update on orbital anatomy.
Eye (Lond). 2006 Nov;20(10):1119–29.
doi: [10.1038/sj.eye.6702376](https://doi.org/10.1038/sj.eye.6702376)

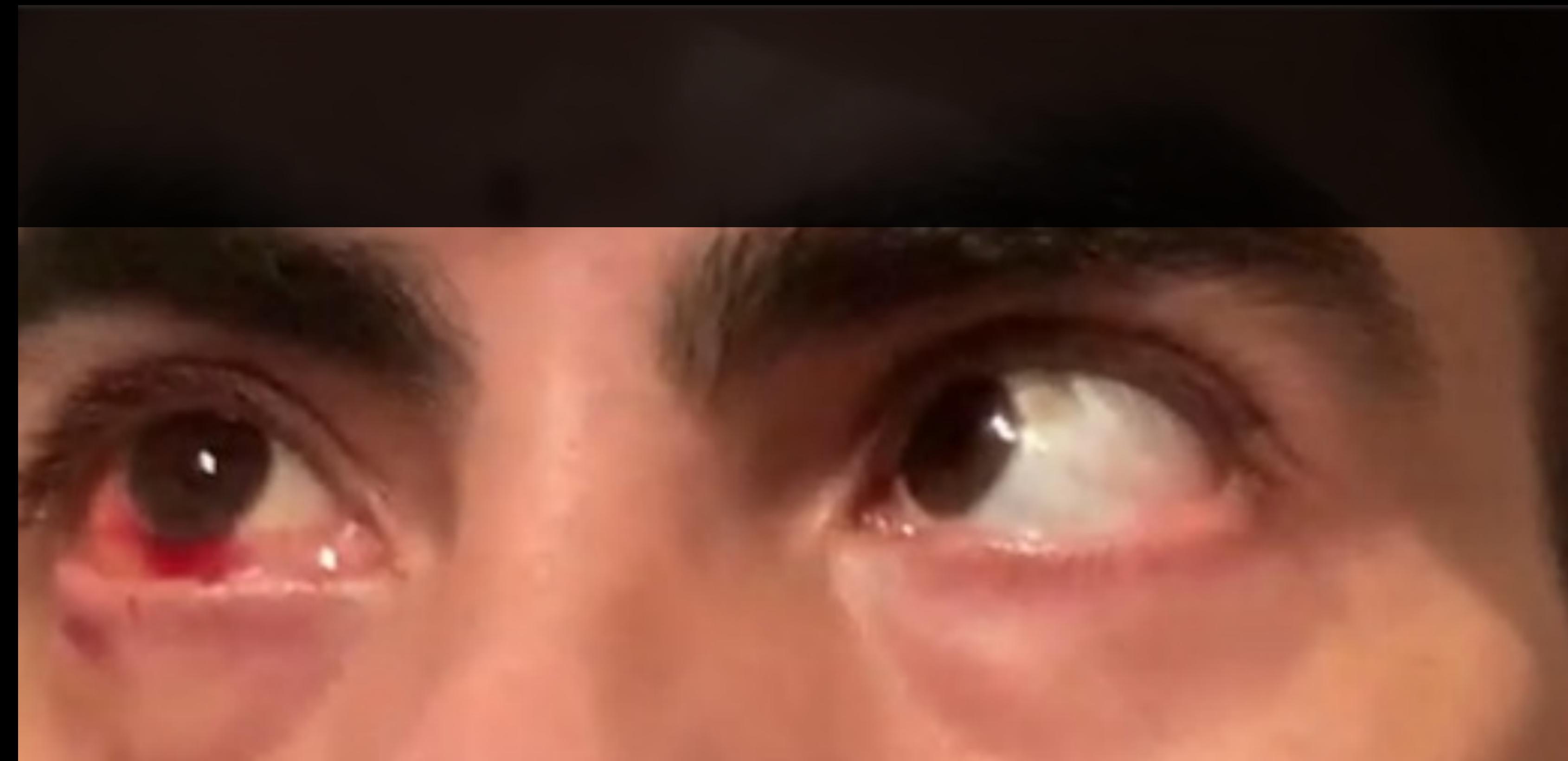


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Accidente vascular orbitario post inyección de AH
(Isquemia del músculo recto externo y glándula lacrimal)
Diplopía

Izquierdo

Derecho



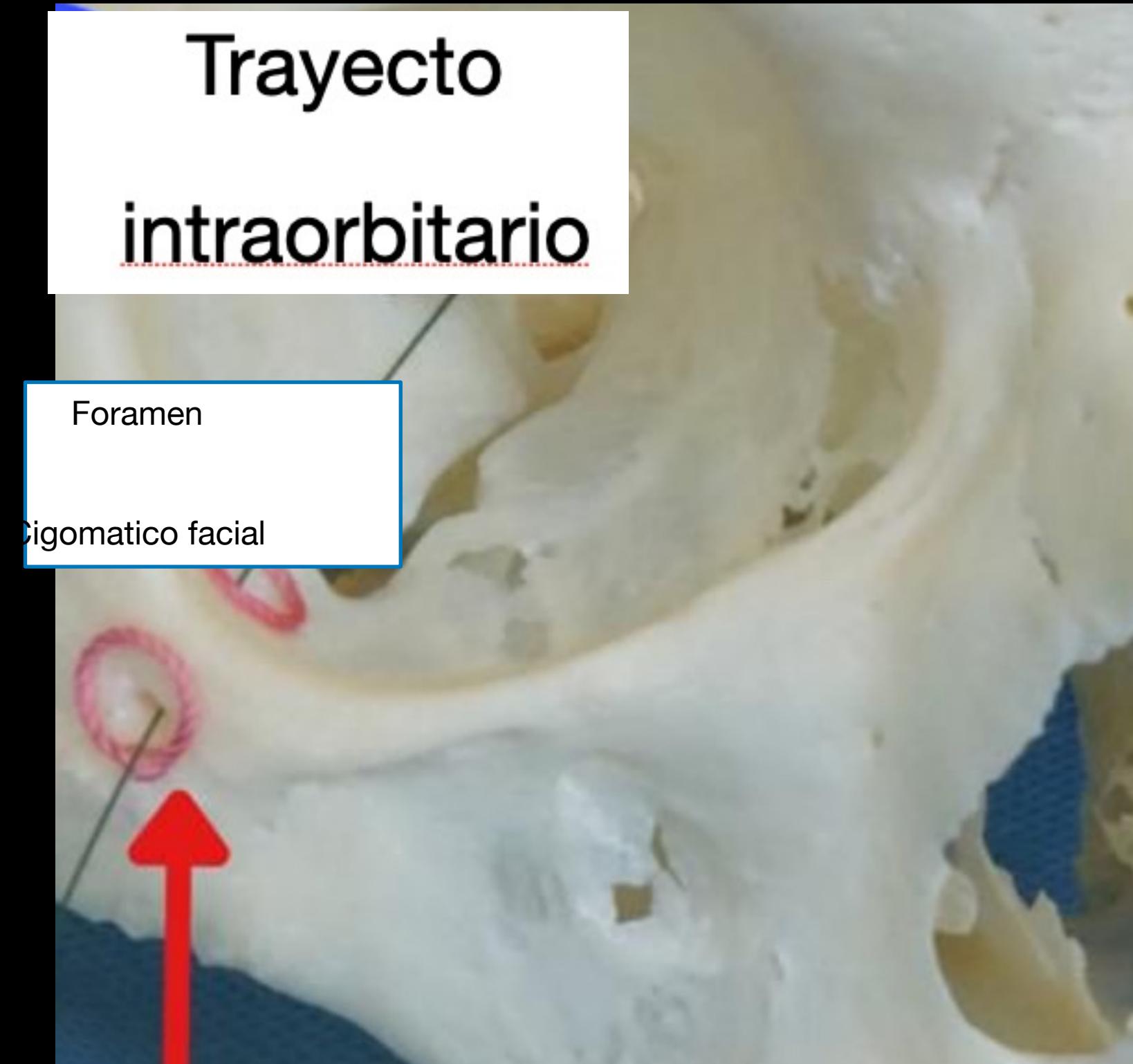
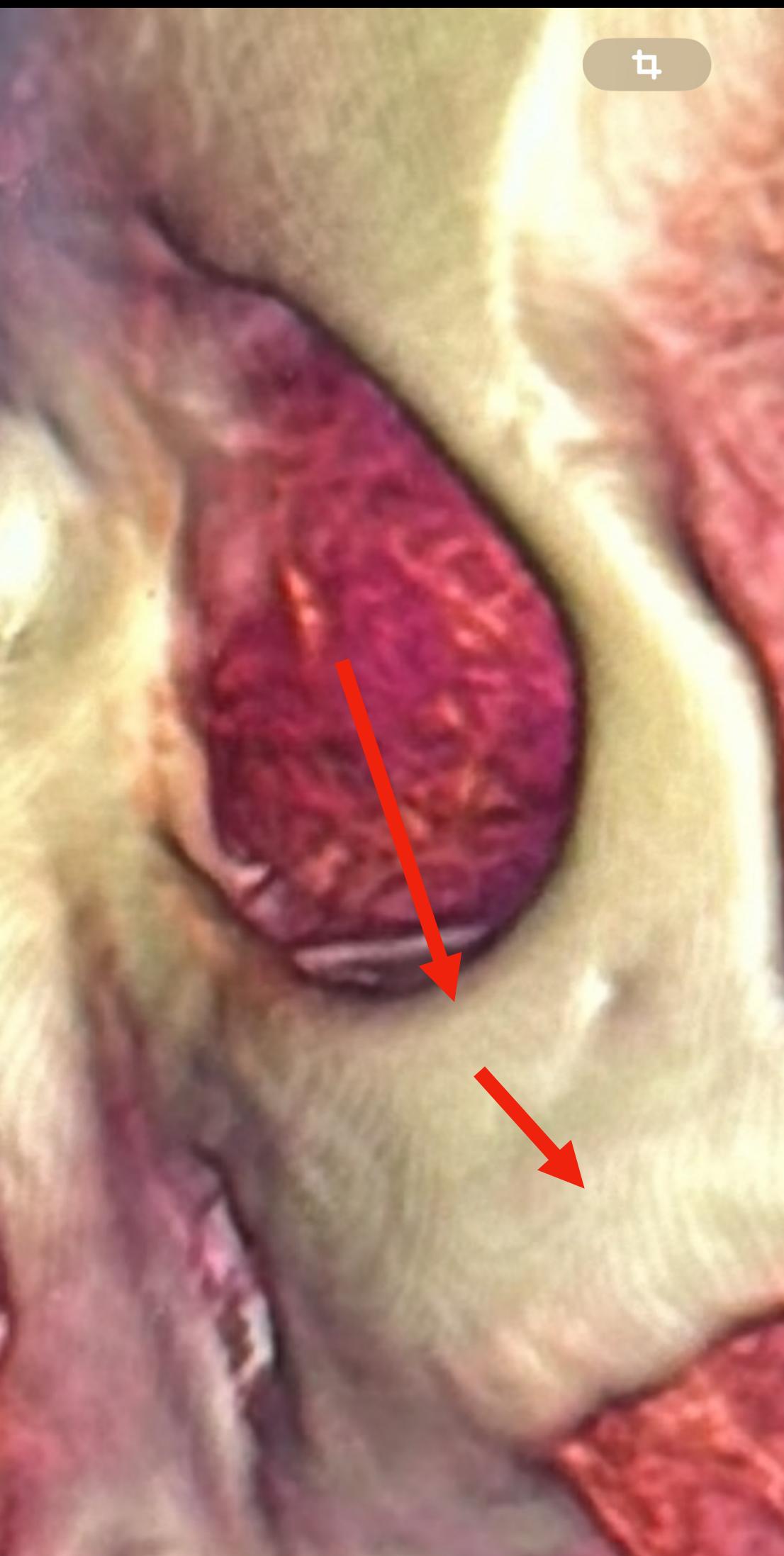
Obstrucción de la arteria cigomático facial

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Fisiopatología :



Sentido normal del flujo

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Forámenes cigomáticofaciales supernumerarios

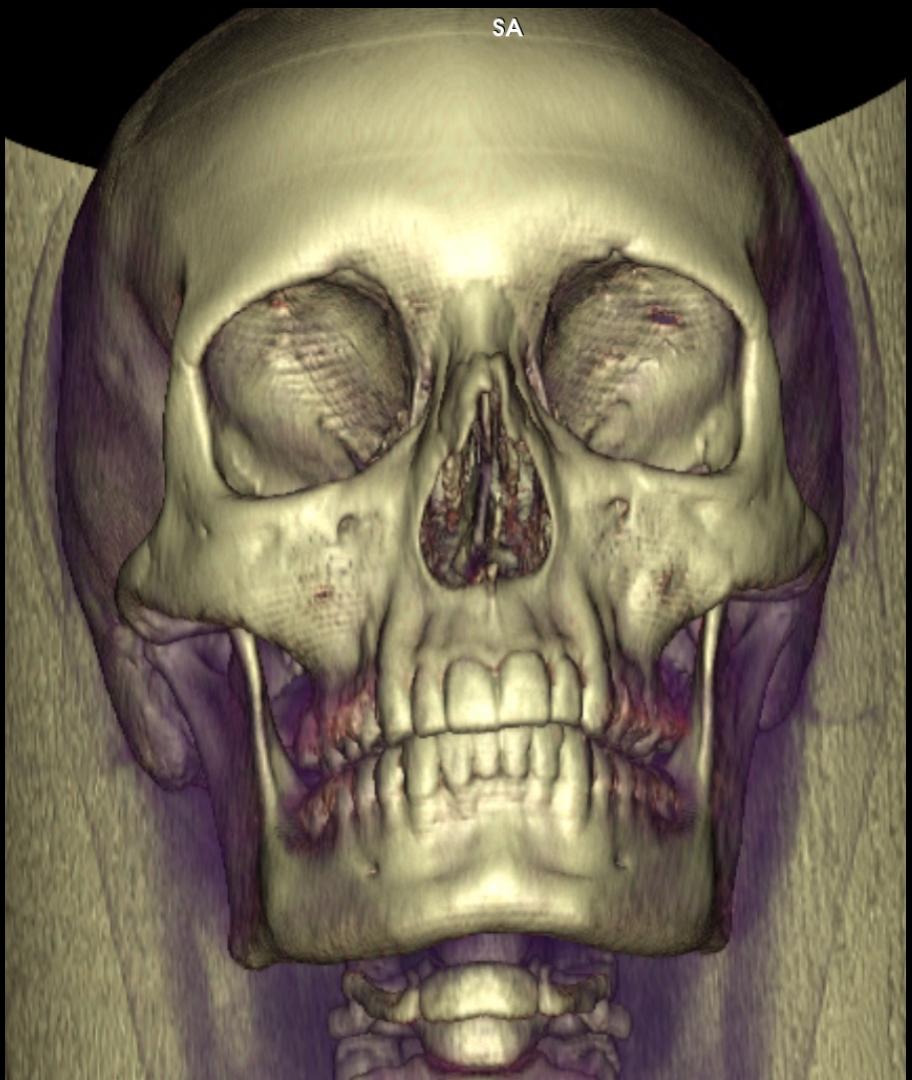


Foramen

D 12

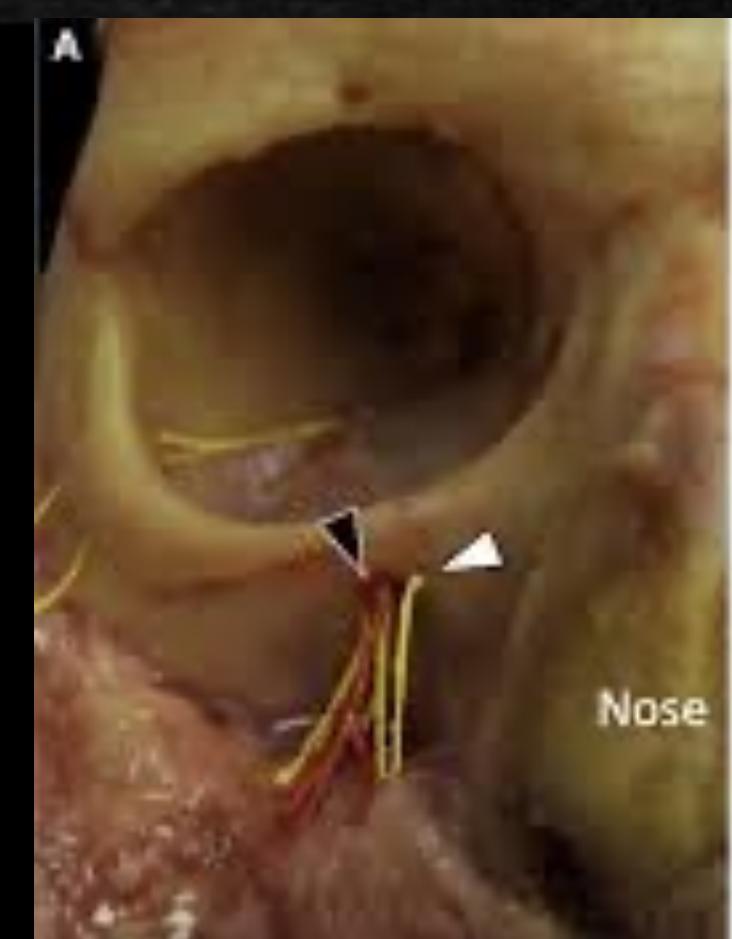
1,178 mm

Infraorbitario



12 FPS / 14,0 MHz

STF



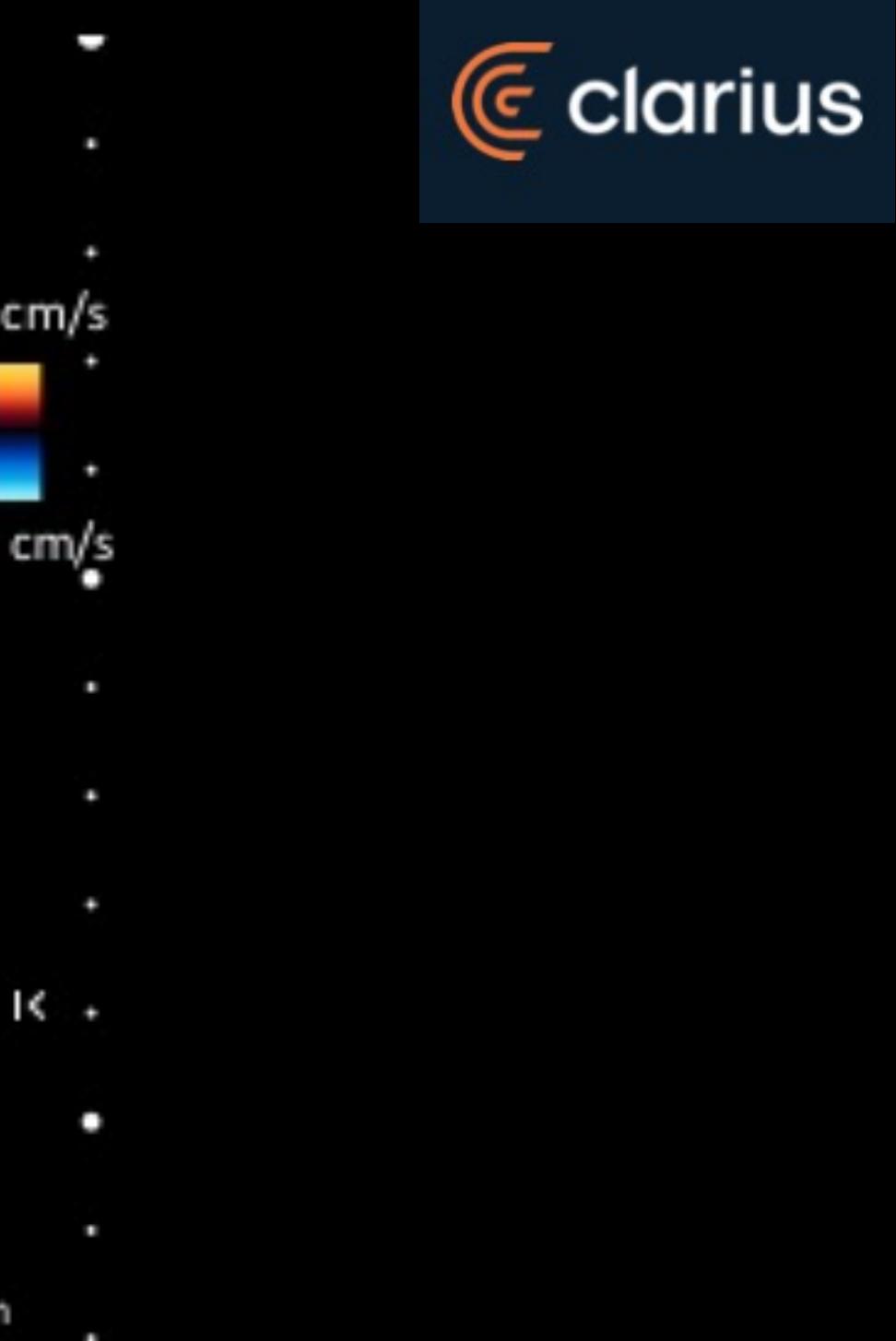
Nose

ANESTHESIA/TMJ DISORDERS/FACIAL PAIN · Volume 78, Issue 5, P717-723, May 2020

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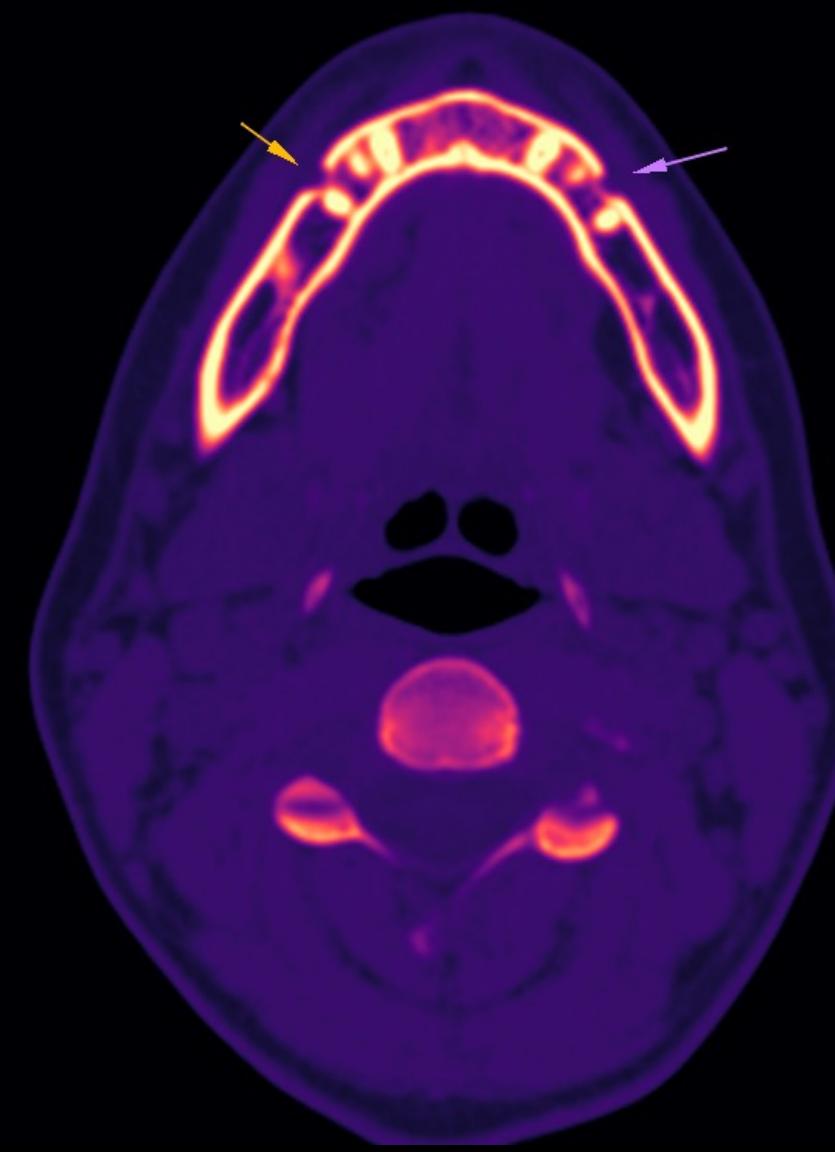
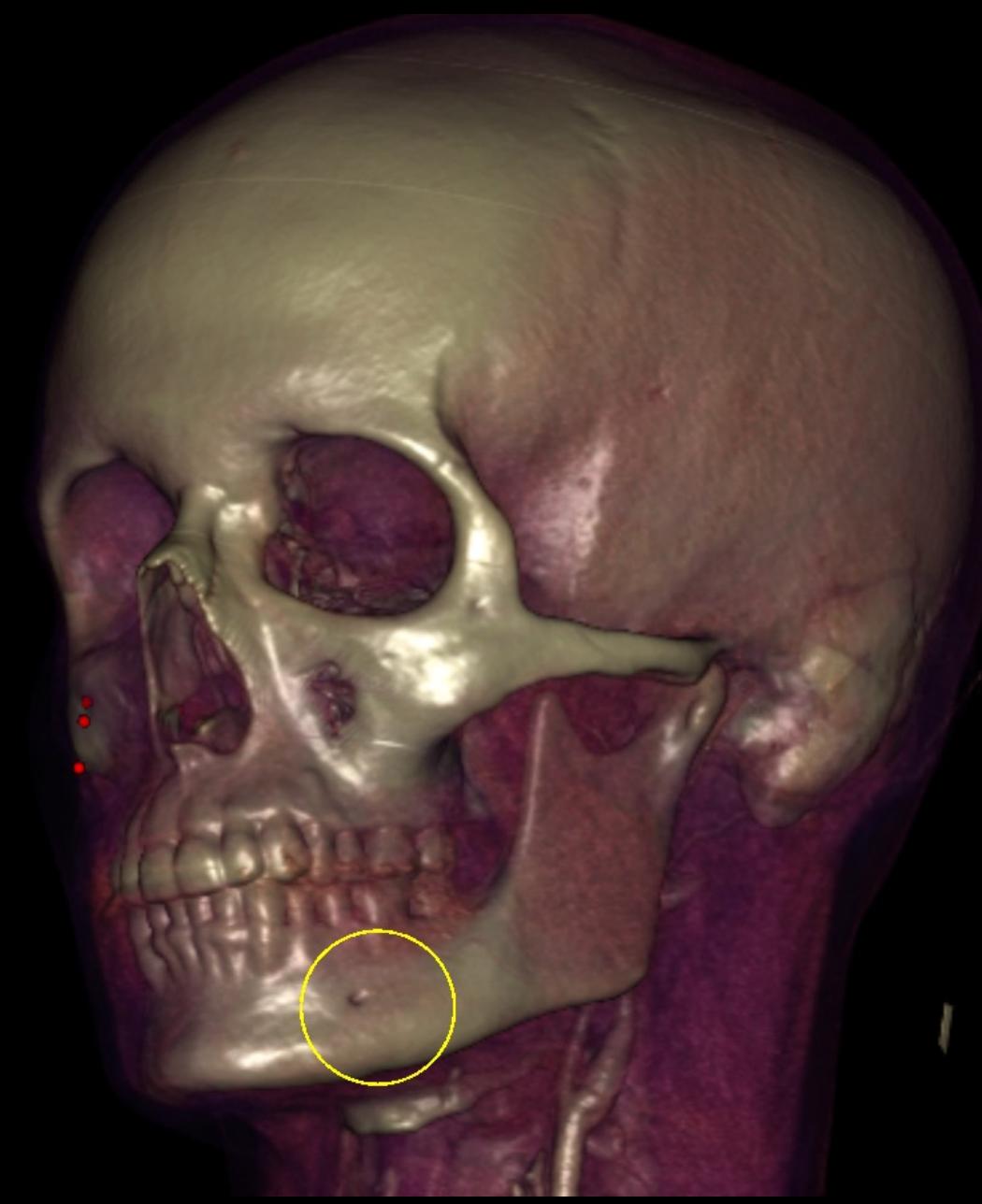
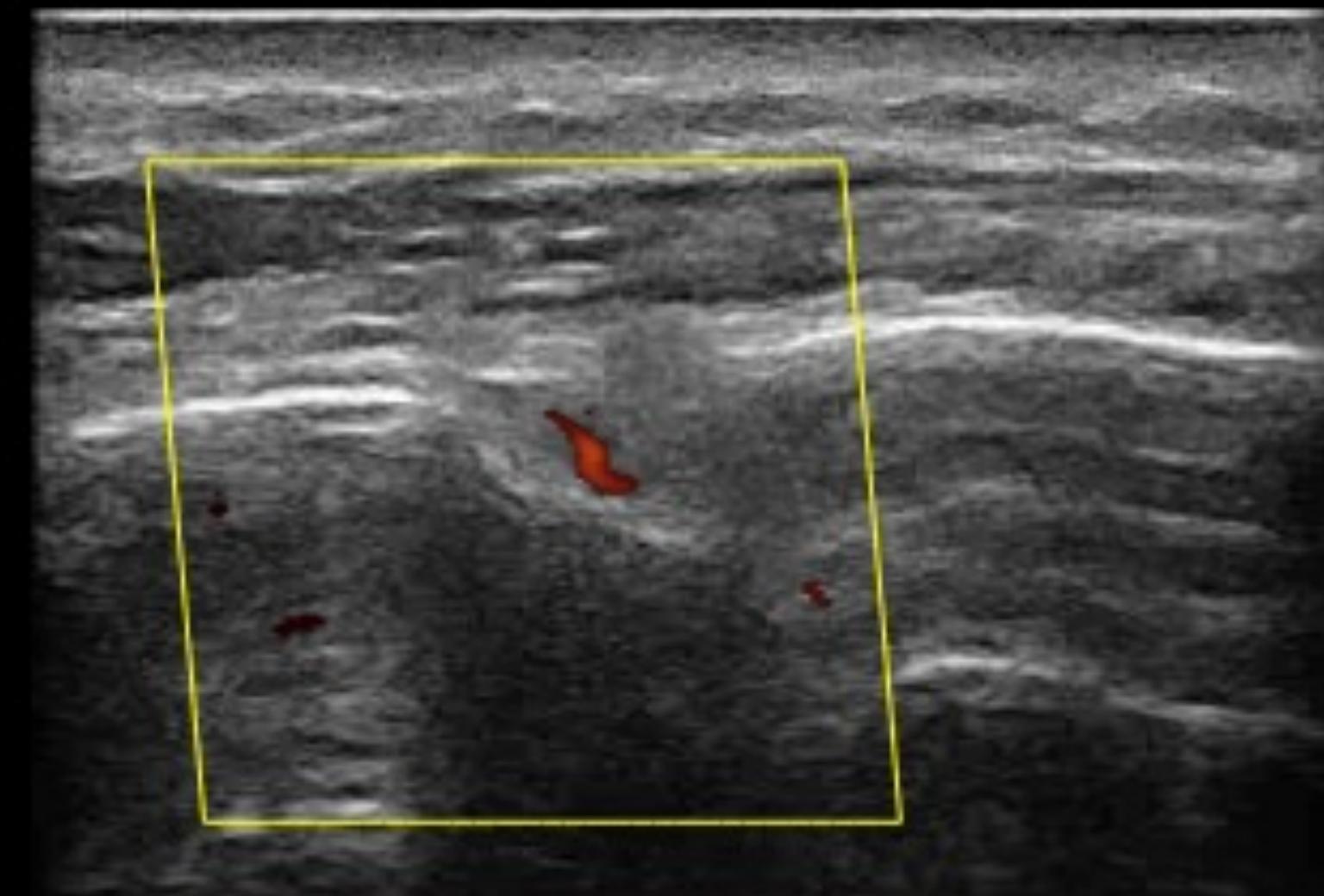
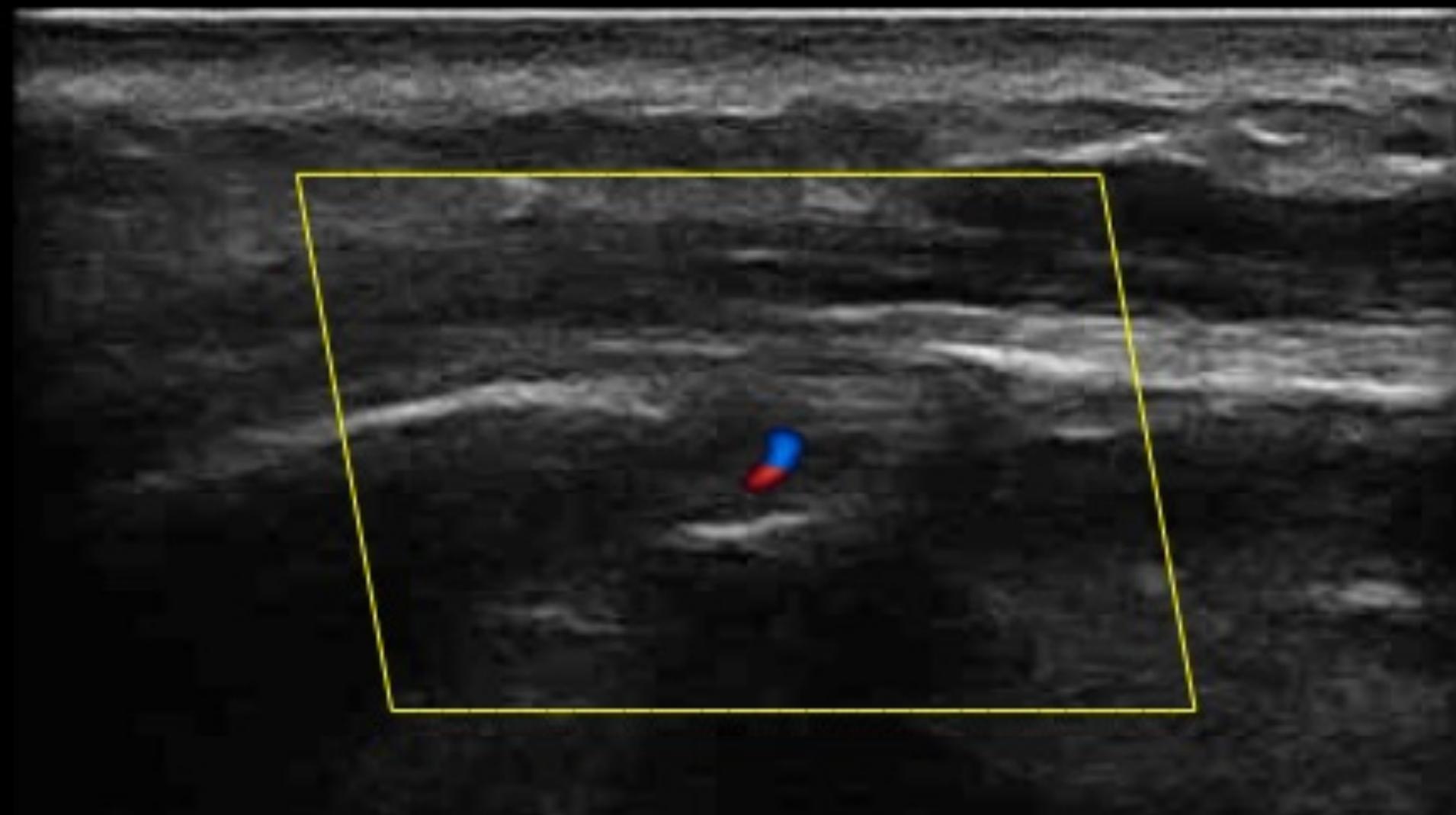
Anatomic Study of Accessory Infraorbital Nerves and Foramina: Application for a Better Understanding of Complications of Le Fort Fractures and Osteotomy

Joe Iwanaga, DDS, PhD * · Shogo Kikuta, DDS, PhD † · Jingo Kusukawa, DDS, PhD ‡ · Krzysztof A. Tomaszewski, MD, PhD § · Jerzy A. Walocha, MD, PhD || · R. Shane Tubbs, PhD, PA-C #

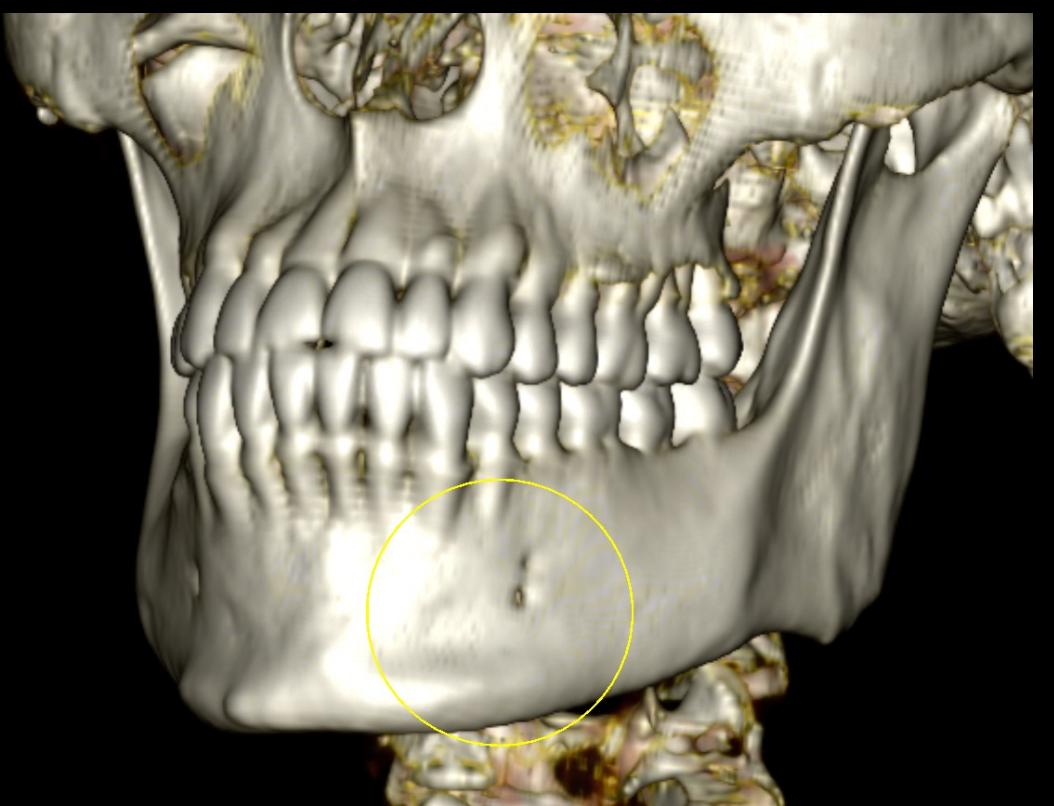


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Foramen mentoniano

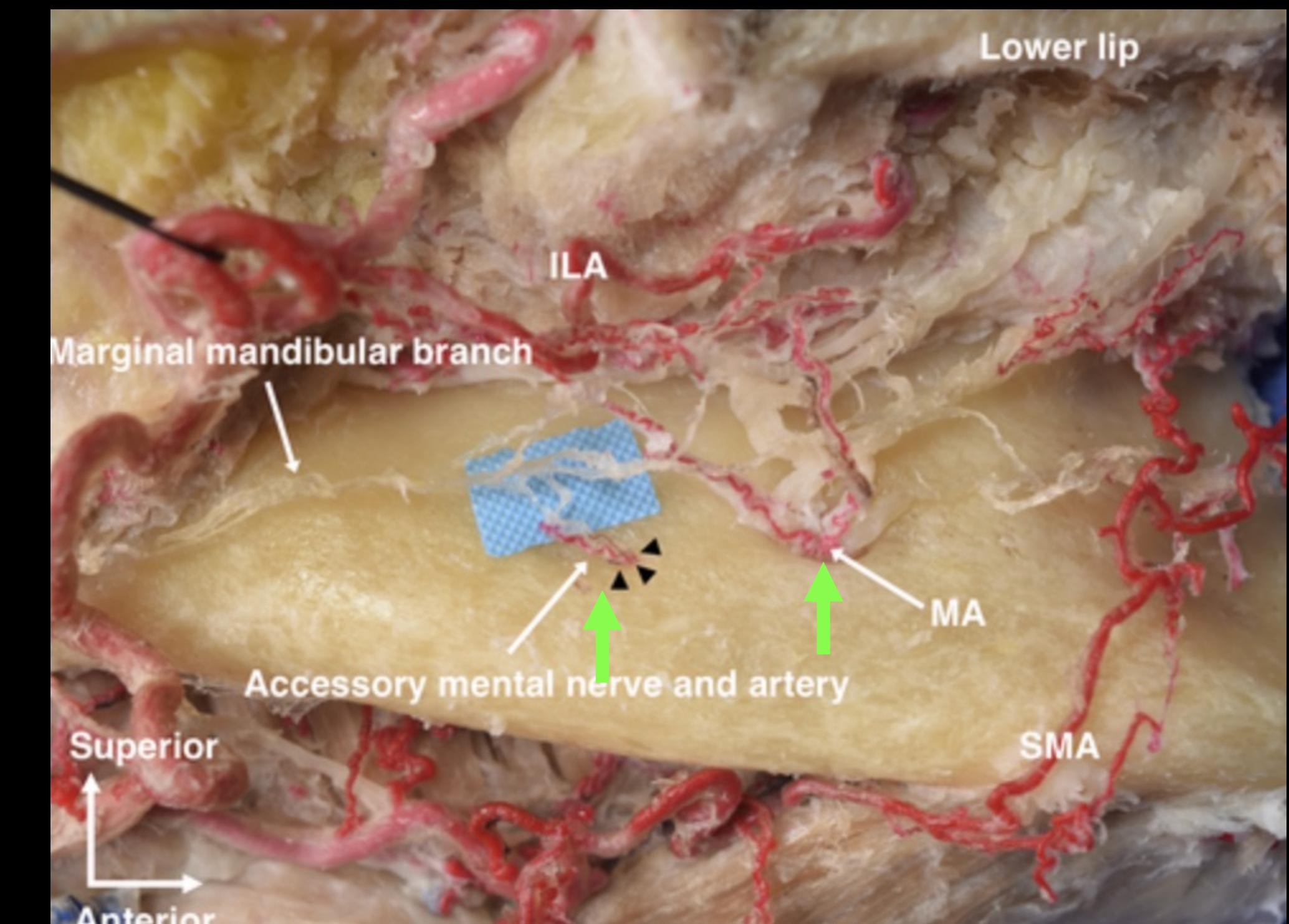
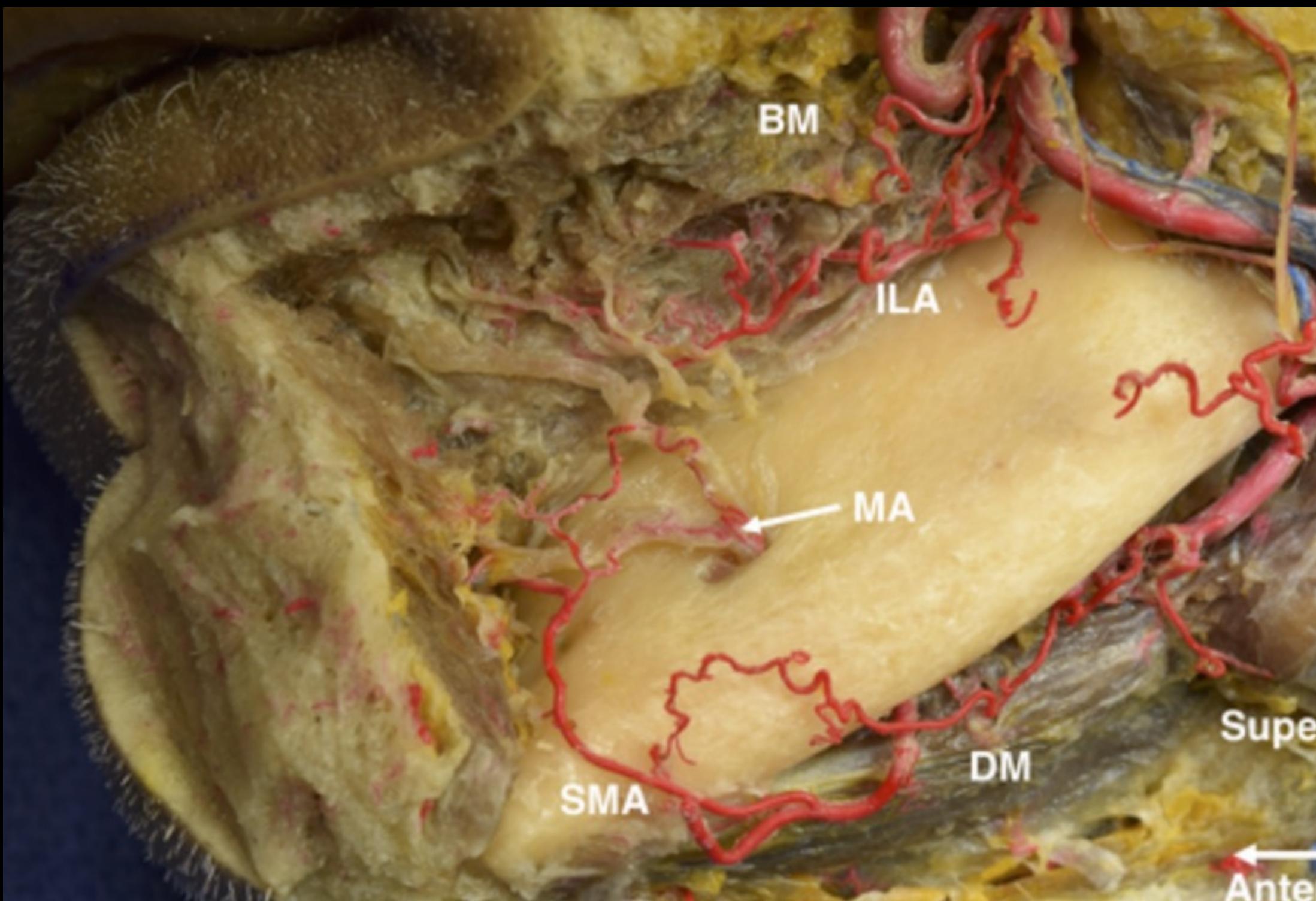


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The mental artery: anatomical study and literature review

Shogo Kikuta, Joe Iwanaga, Jingo Kusukawa, R. Shane Tubbs



- La ecografía de alta resolución sólo nos permite ver la cortical ósea
- Línea hiperecoica (fracturas, lesiones de la cortical, material de osteosíntesis)
- Número de forámenes
- Orientación de los mismos



La ecografía facial se ha consolidado como una herramienta accesible y de valor incalculable en la práctica estética actual. Su utilización nos permite visualizar la anatomía real de cada paciente antes, durante y después de los procedimientos, lo que se traduce en tratamientos más eficaces, seguros y precisos.

Contar con esta visión anatómica individualizada eleva significativamente los estándares de calidad, especialmente en intervenciones que llevan un mayor grado de riesgo. Sin duda, la posibilidad de “ver a través de la piel” de manera no invasiva ha transformado profundamente nuestra forma de planificar, decidir y actuar en medicina estética.

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Janaye Smith, CRGS
Ecografista



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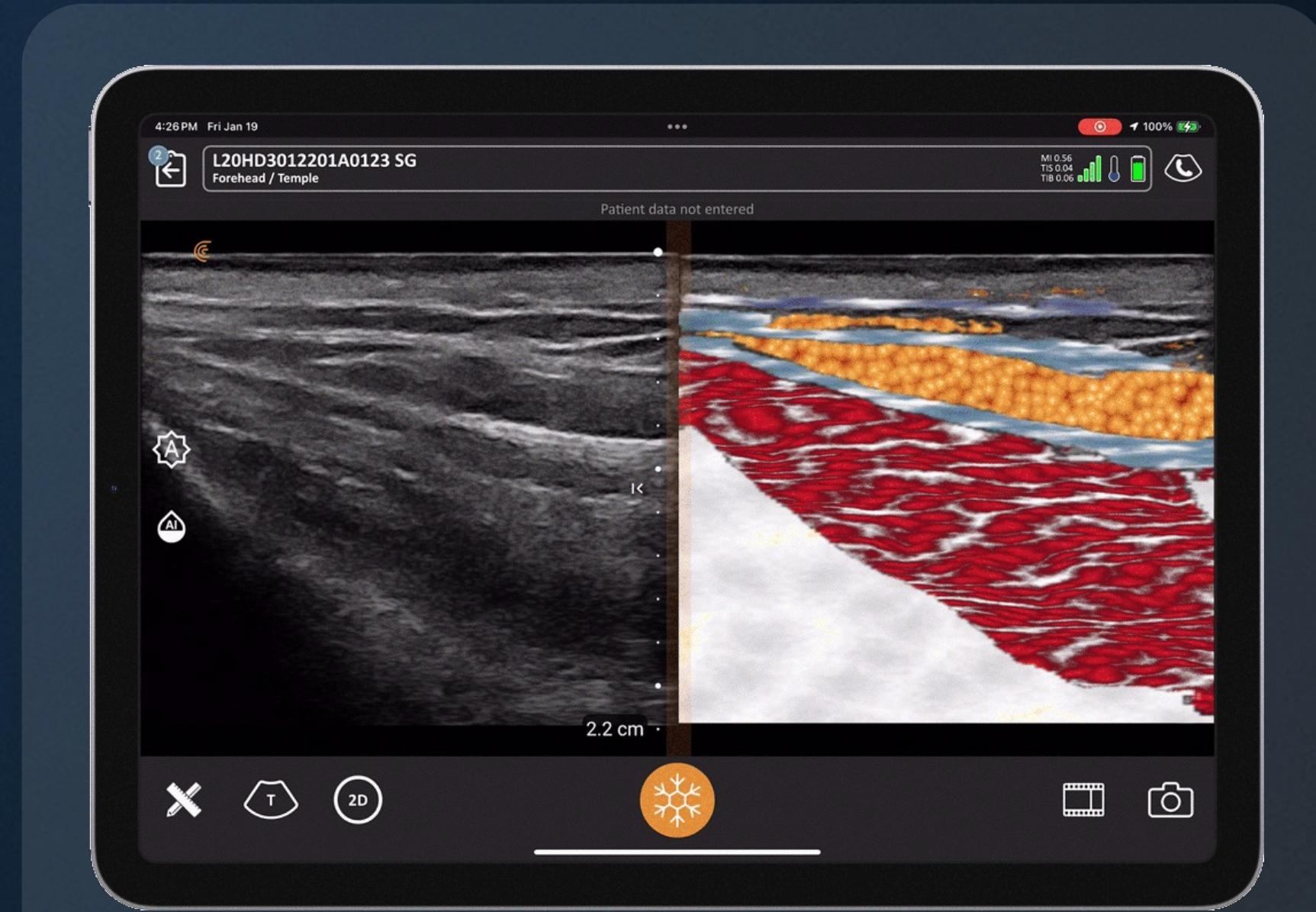
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Preguntas



Dr. Karina Raverá, MD

Médica Especialista en Diagnóstico por
Imágenes | Post grado en Medicina Estética



Francisco Morando

Presentador | Gerente de Distribución,
Clarius



¡Gracias!