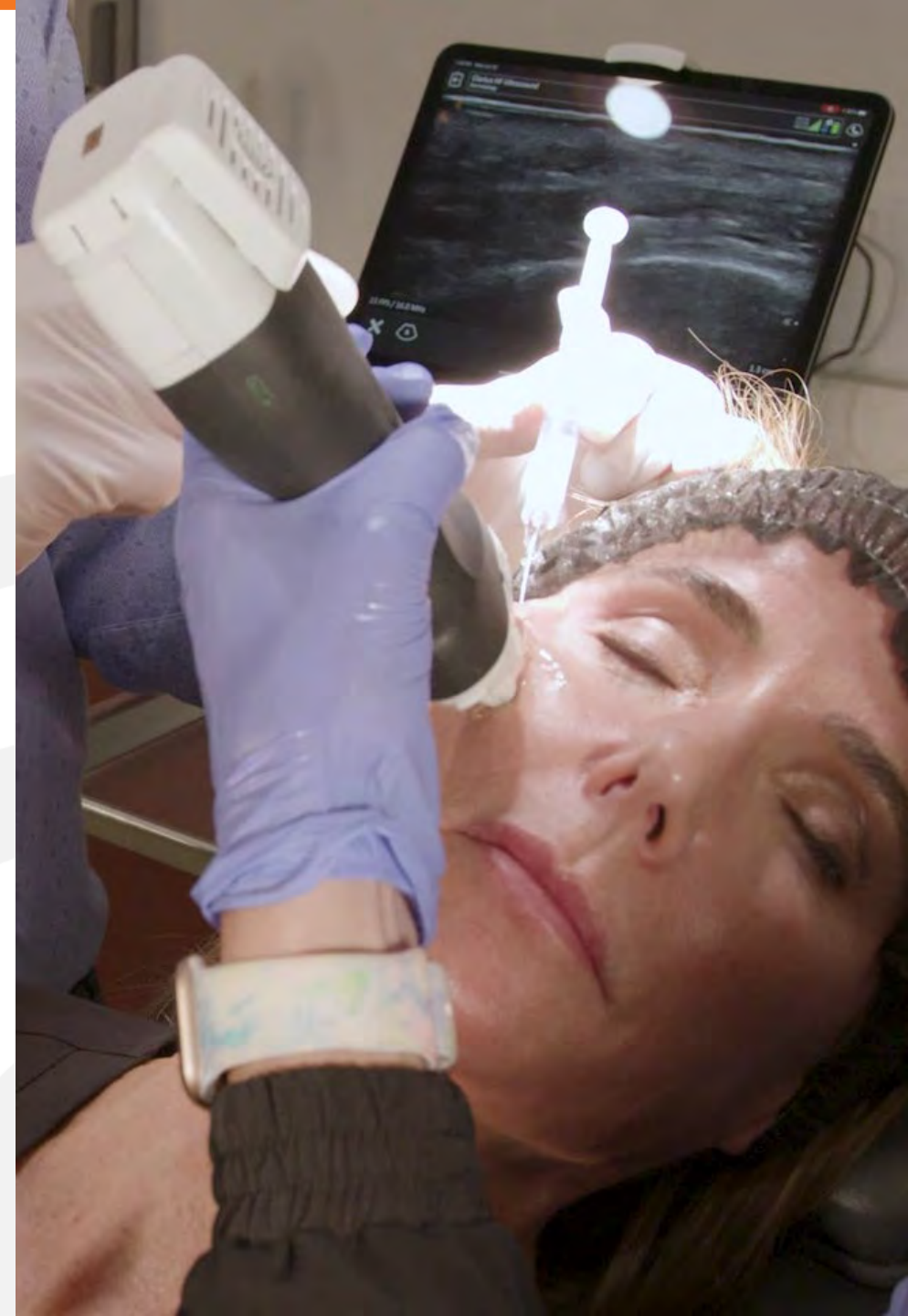


**WEBINAR**

# Facial Aesthetic Complications: Using Ultrasound to Dissolve Fillers and Reverse Vascular Occlusions

September 2021



# Your Host



## **Dr. Oron Frenkel, MD, MS**

Emergency Physician & POCUS Educator

Chairman, Clarius Medical Advisory Board

# Facial Aesthetic Complications

# Complications After Cosmetic Periocular Filler: Prevention and Management



*“Complications range from mild superficial skin irregularities to **granuloma** formation to **vascular occlusion** leading to **skin necrosis** or even **blindness**.”*

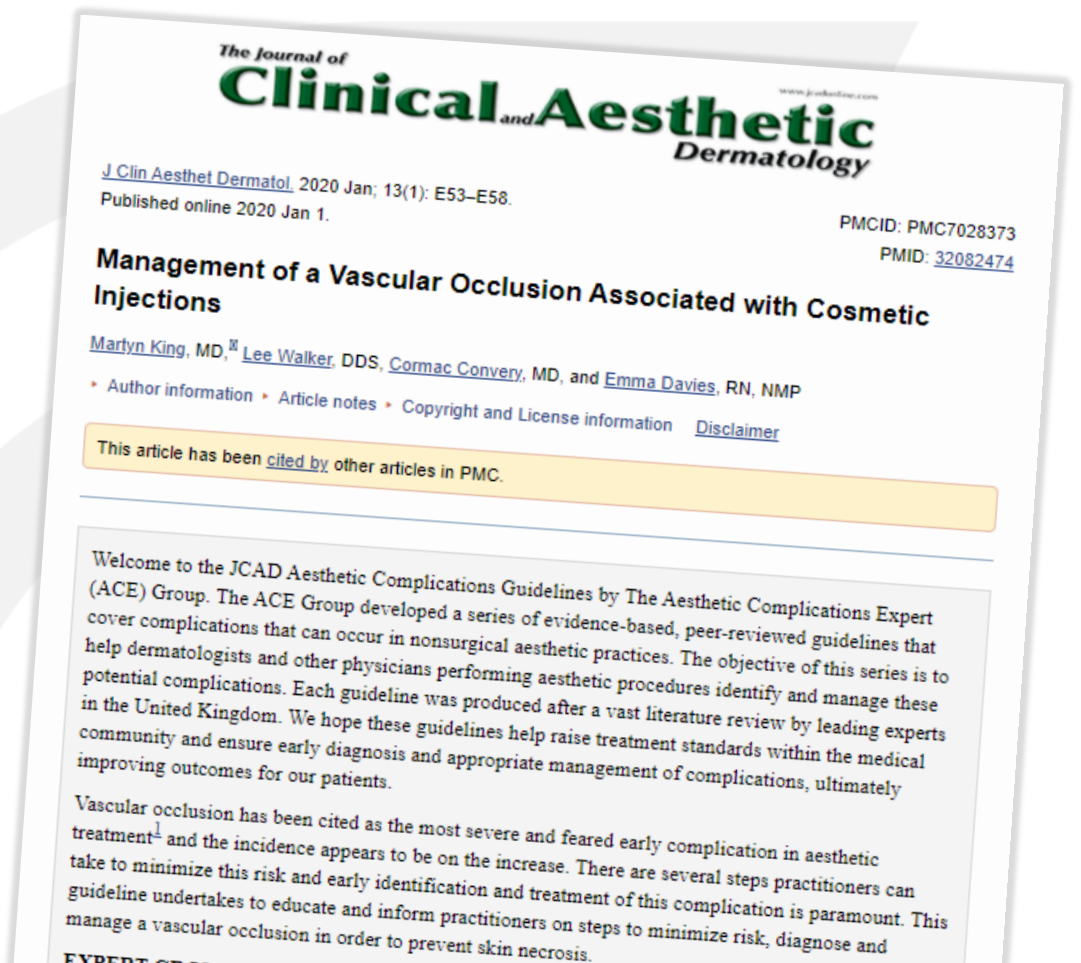
Zein M, Tie-Shue R, Pirakitikulr N, Lee WW. Complications after cosmetic periocular filler: prevention and management. *Plast Aesthet Res.* 2020;7:44. doi: 10.20517/2347-9264.2020.133. Epub 2020 Aug 15. PMID: 33102629; PMCID: PMC7583139. Source: <https://pubmed.ncbi.nlm.nih.gov/33102629/>



# Management of a Vascular Occlusion Associated with Cosmetic Injections

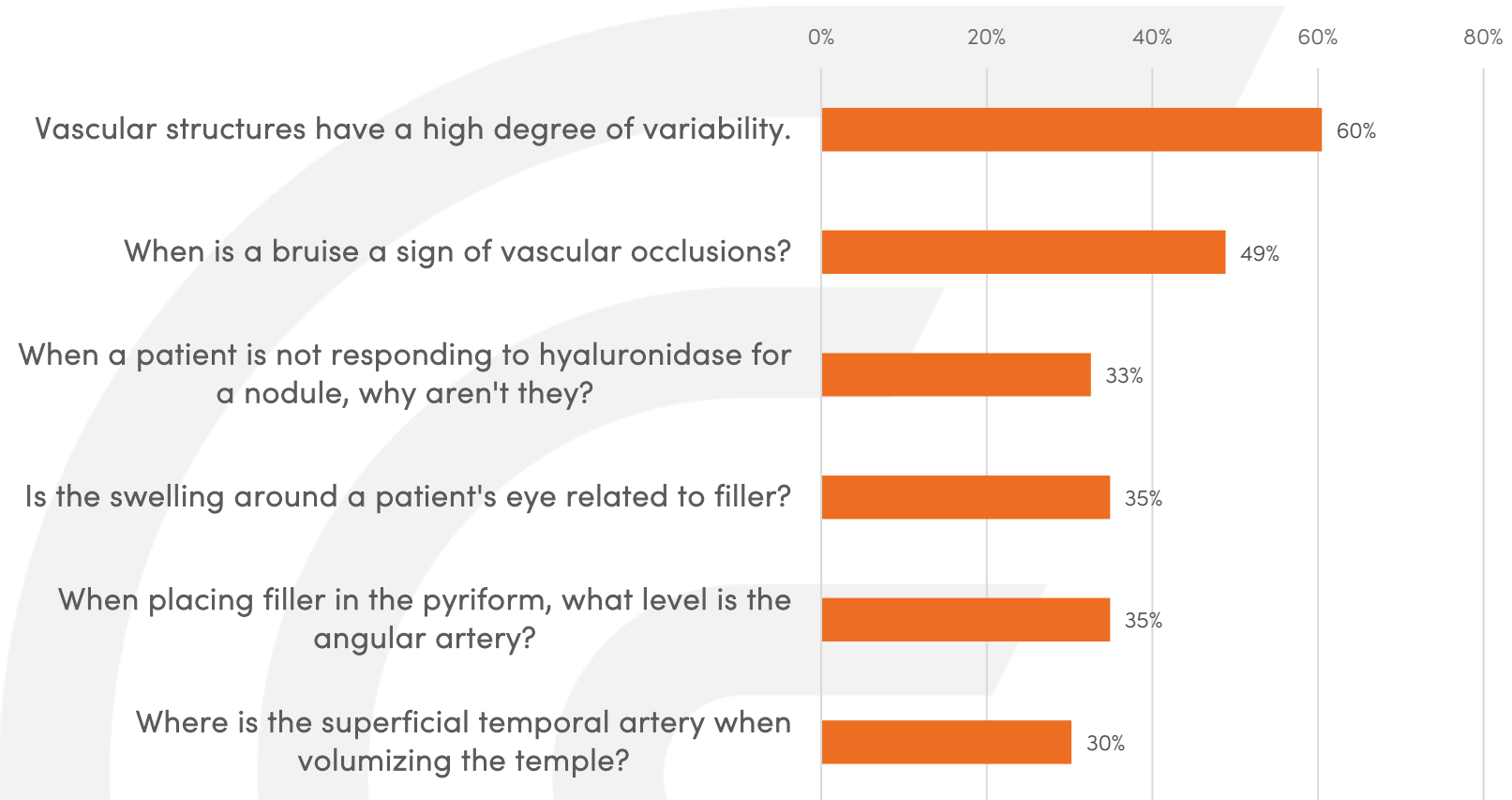
*“In an internet-based survey completed by 52 experienced injectors worldwide, 62 percent reported one or more intravascular events.”*

Martyn King, Lee Walker, Cormac Convery, Emma Davies, J Clin Aesthet Dermatol. 2020 Jan; 13(1): E53–E58. Published online 2020 Jan 1. PMCID: PMC7028373. Source: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7028373/>



# Poll

What challenges do you find concerning when performing dermal fillers?



# Ultrasound to Improve the Safety of Hyaluronic Acid Filler Treatments



*“Dislocation, abscesses, and vascular adverse events can be seen. Under ultrasound guidance, hyaluronidase can be injected directly into the filler deposit.”*

Schelke LW, Decates TS, Velthuis PJ. Ultrasound to improve the safety of hyaluronic acid filler treatments. J Cosmet Dermatol. 2018 Dec;17(6):1019-1024. doi: 10.1111/jocd.12726. Epub 2018 Aug 6. PMID: 30084182.. Source: <https://pubmed.ncbi.nlm.nih.gov/30084182/>

# Using Ultrasound to Dissolve Fillers and Reverse Vascular Occlusions

# Your Expert Guest Speaker



**Dr. Steven F. Weiner, MD**

*Otolaryngology, Head and Neck Surgeon,  
Specializing in Facial Plastic Surgery*



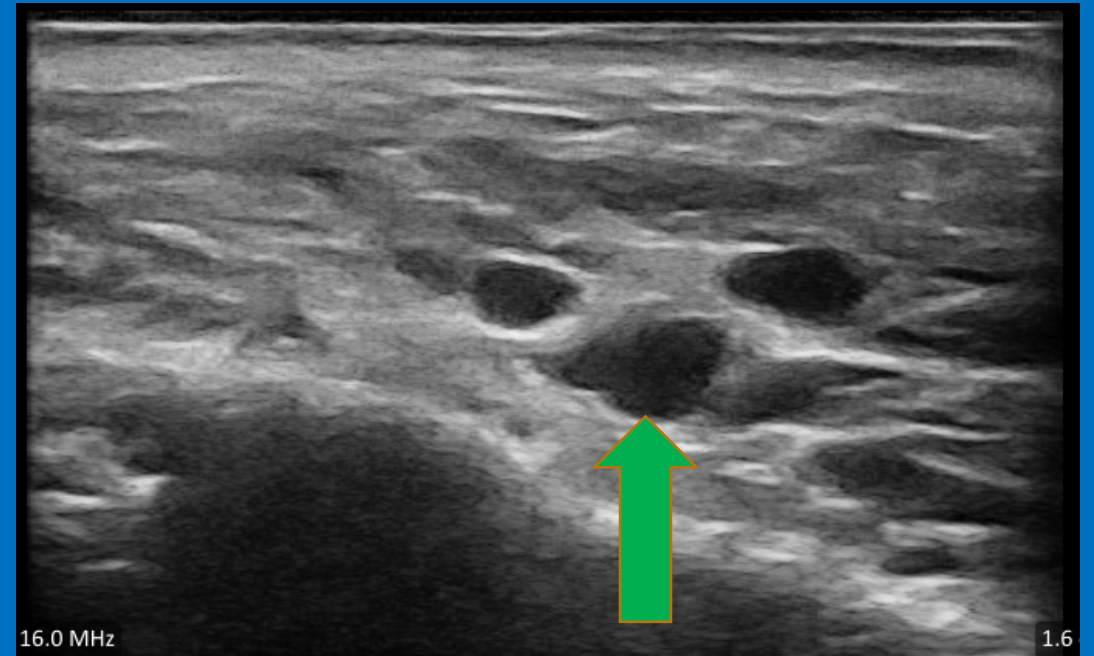
# ULTRASOUND OF FILLERS AND THEIR COMPLICATIONS

Steven F. Weiner, MD  
Facial Plastic Surgeon  
Santa Rosa Beach, Florida

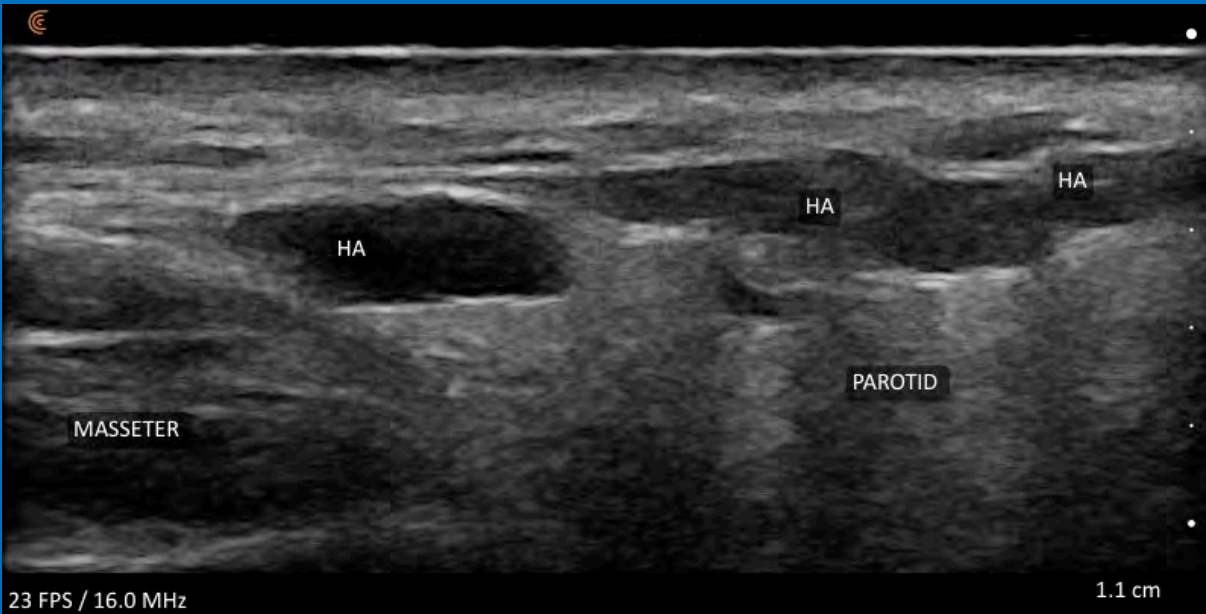


# HYALURONIC ACID

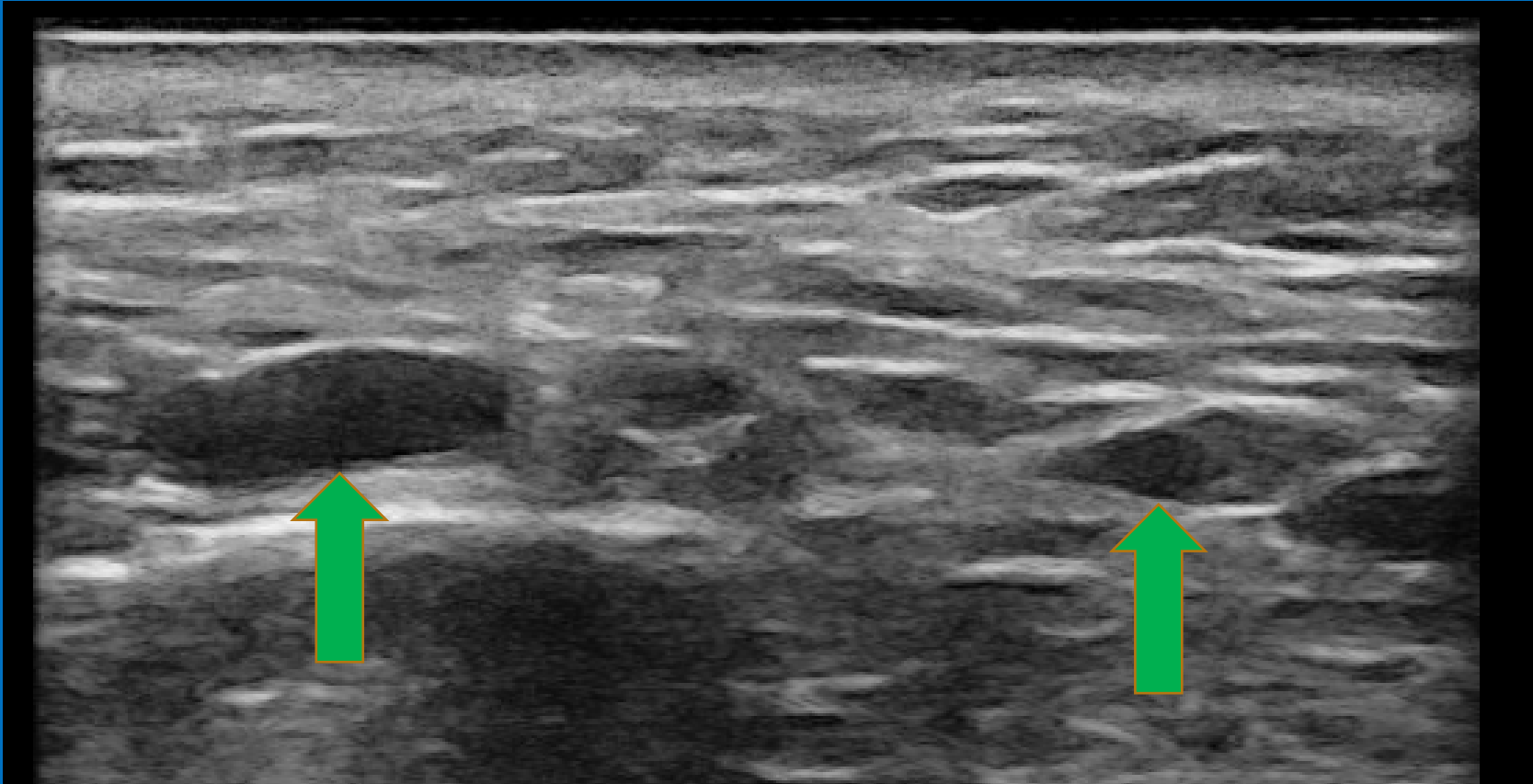
- Hyaluronic Acid (HA) fillers: High absorption of water
  - Anechoic early, hypoechoic later – due to less water content
  - Often have posterior enhancement
  - Appear as well-defined spheres, oval, or pointed oval (think of marquise diamond)
  - Even when placed with cannula, linear appearance is very short lived



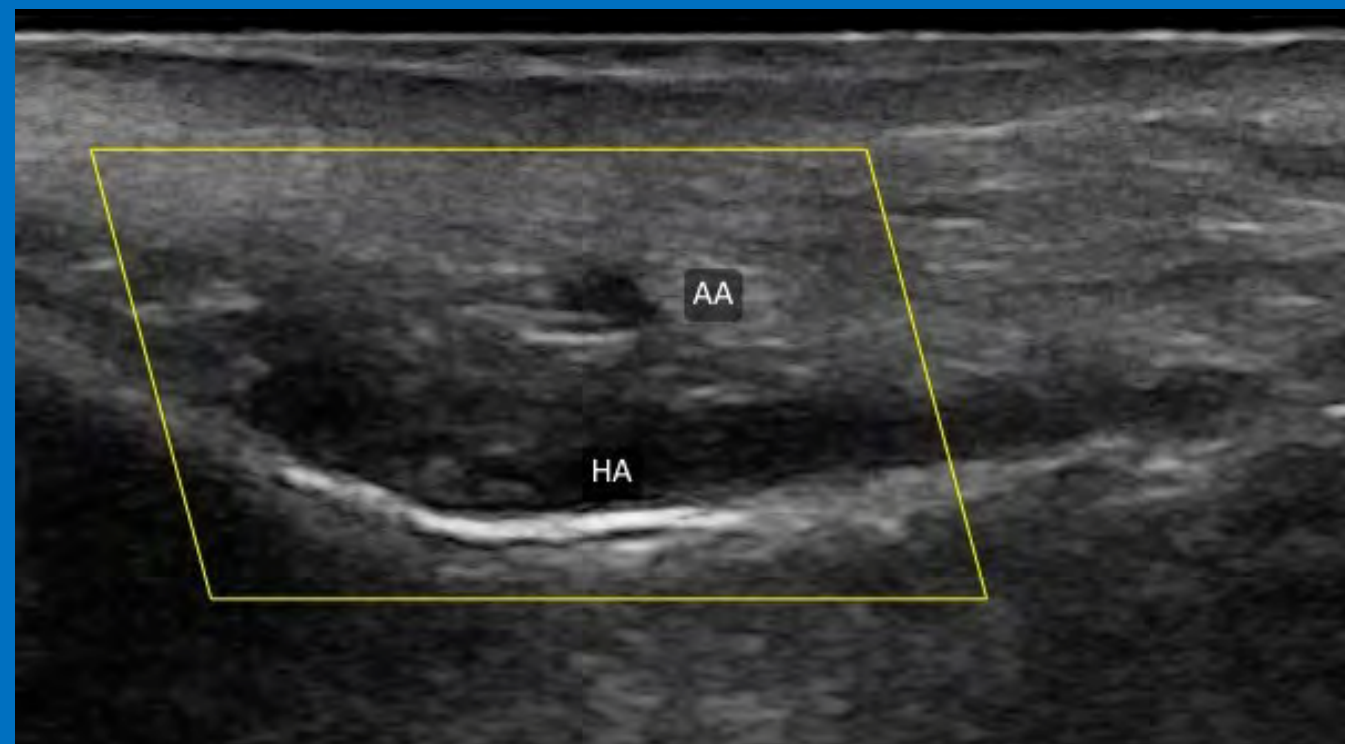
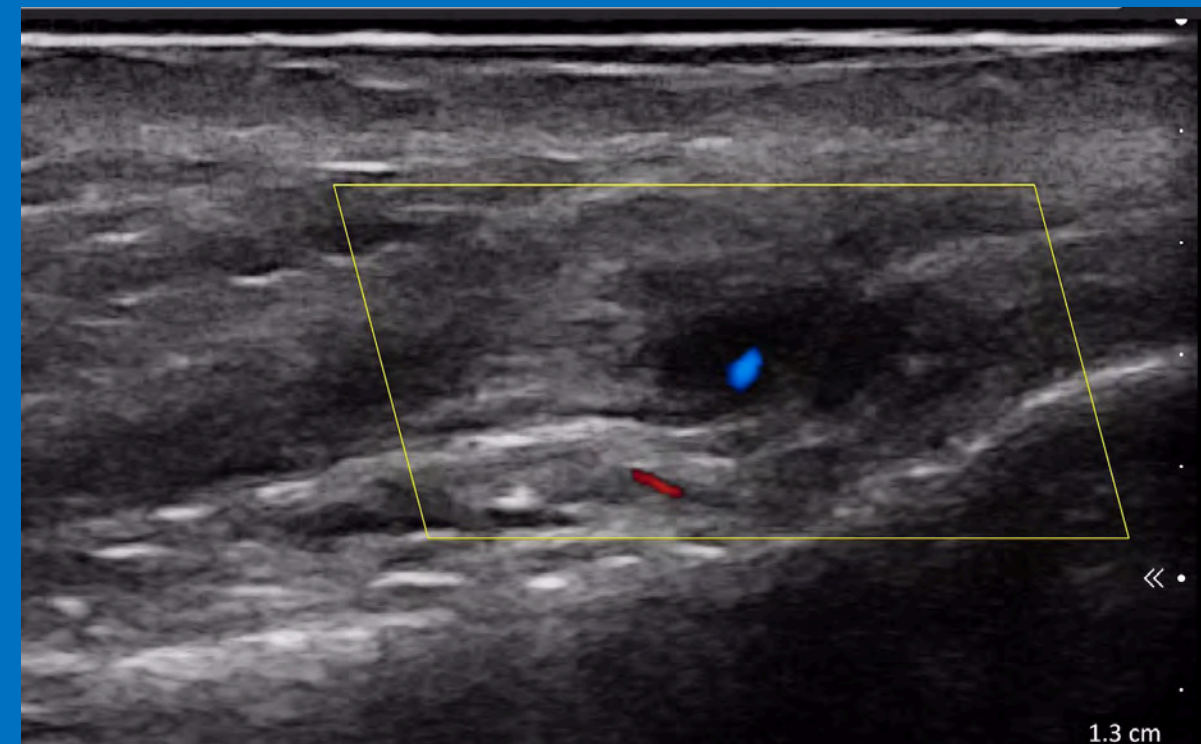
## PREAURICULAR/SUBMALAR HA



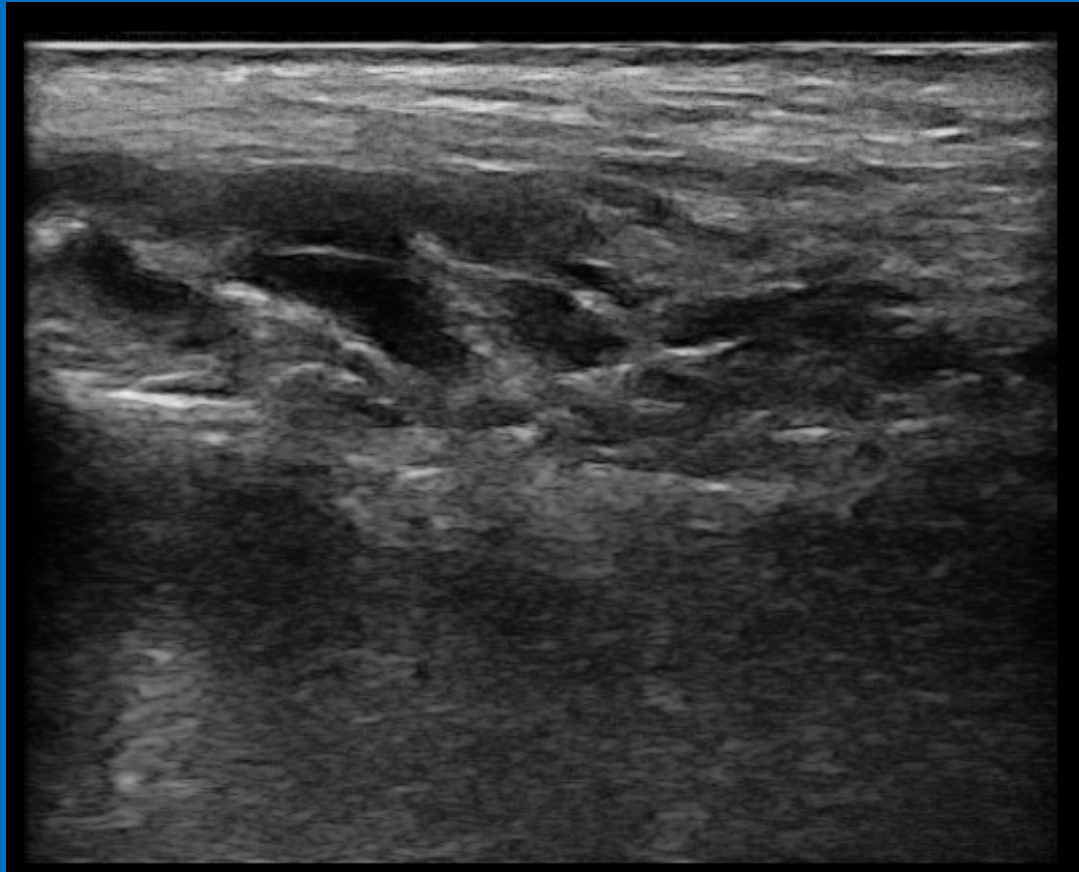
HA (VOLUMA) ON ZYGOMATIC ARCH –  
2 YEARS OLD SERIAL BOLUS



## DEEP PIRIFORM SPACE AND ANGULAR ARTERY – MUST LOOK FIRST

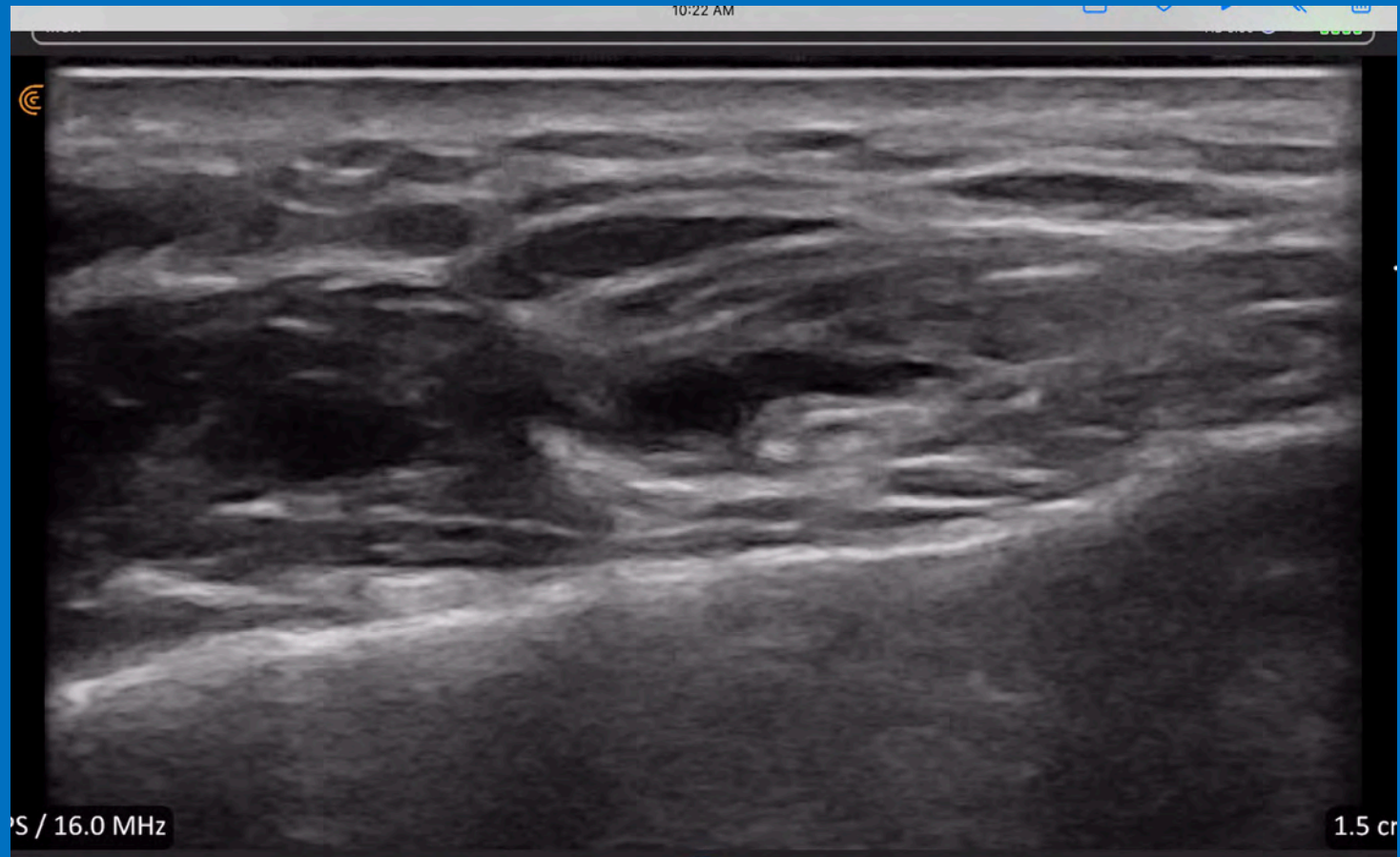


RHA 3 IN NLF – THERE ARE  
DIFFERENCES BETWEEN HA'S





# DOES HA STAY ON PERIOSTEUM?

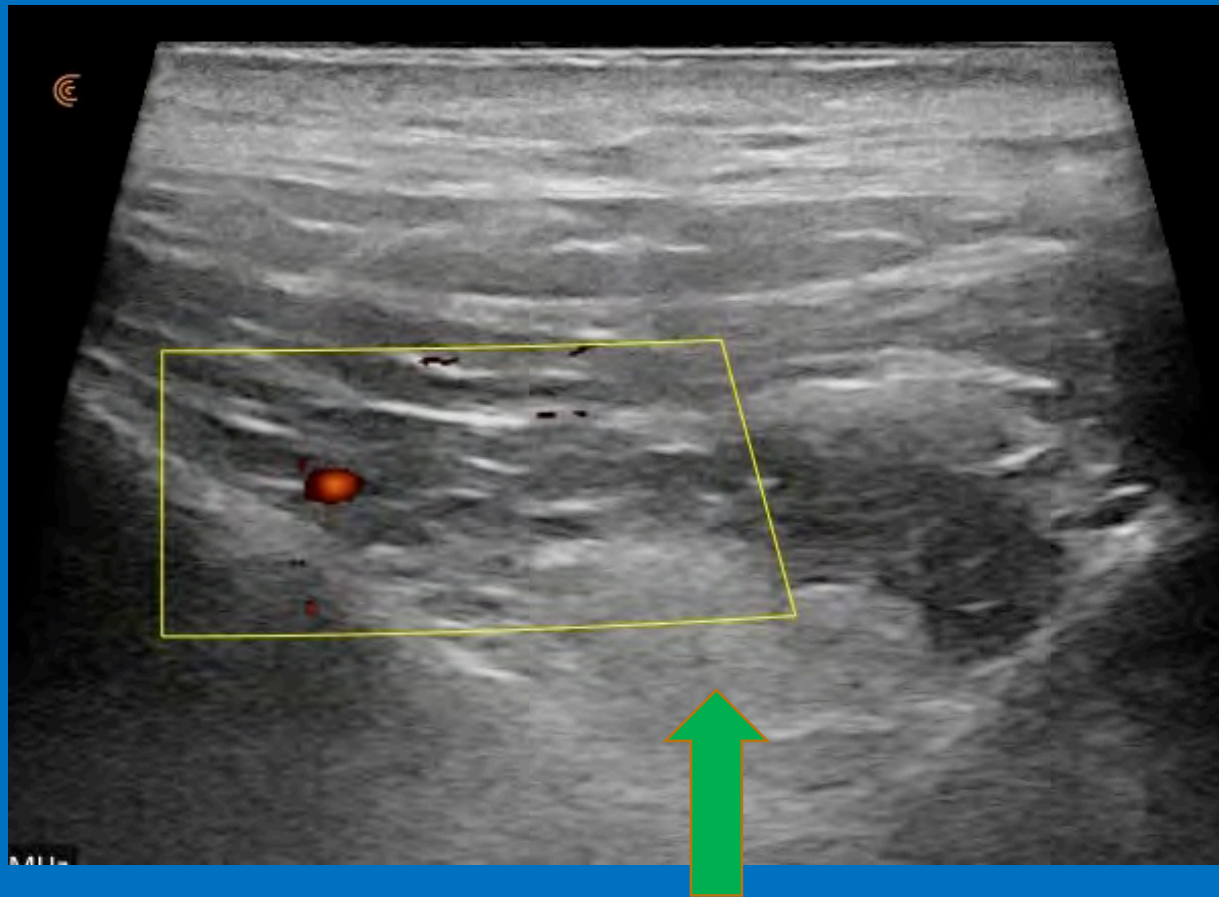




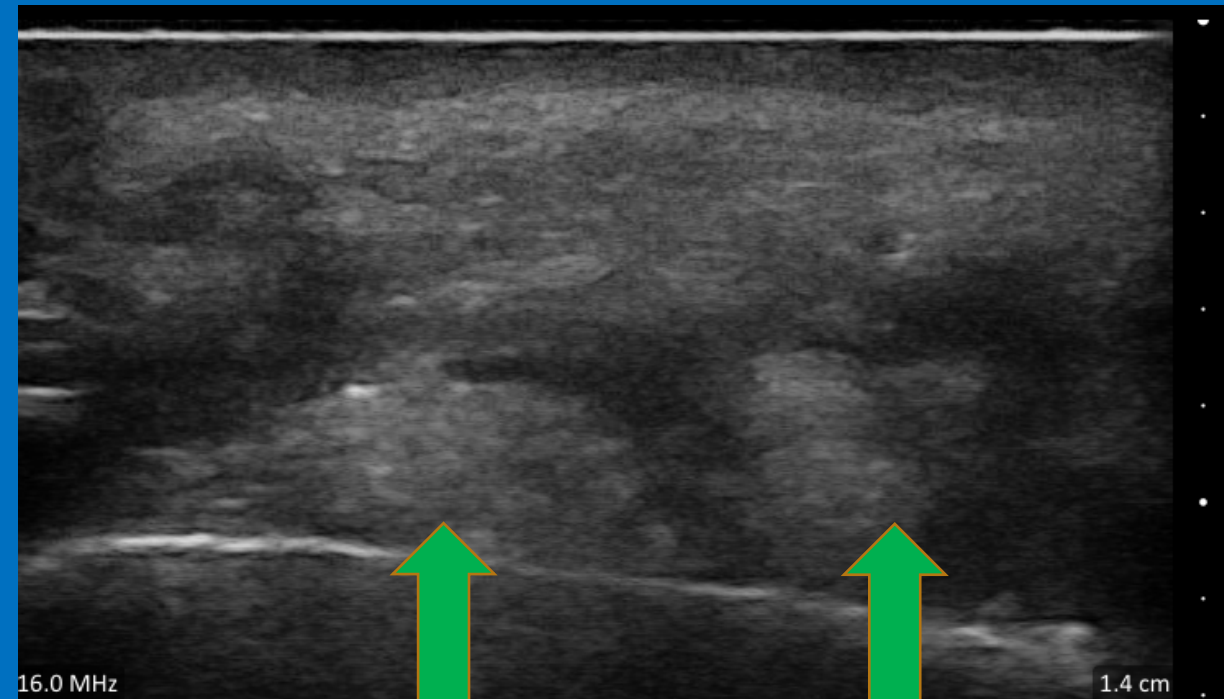
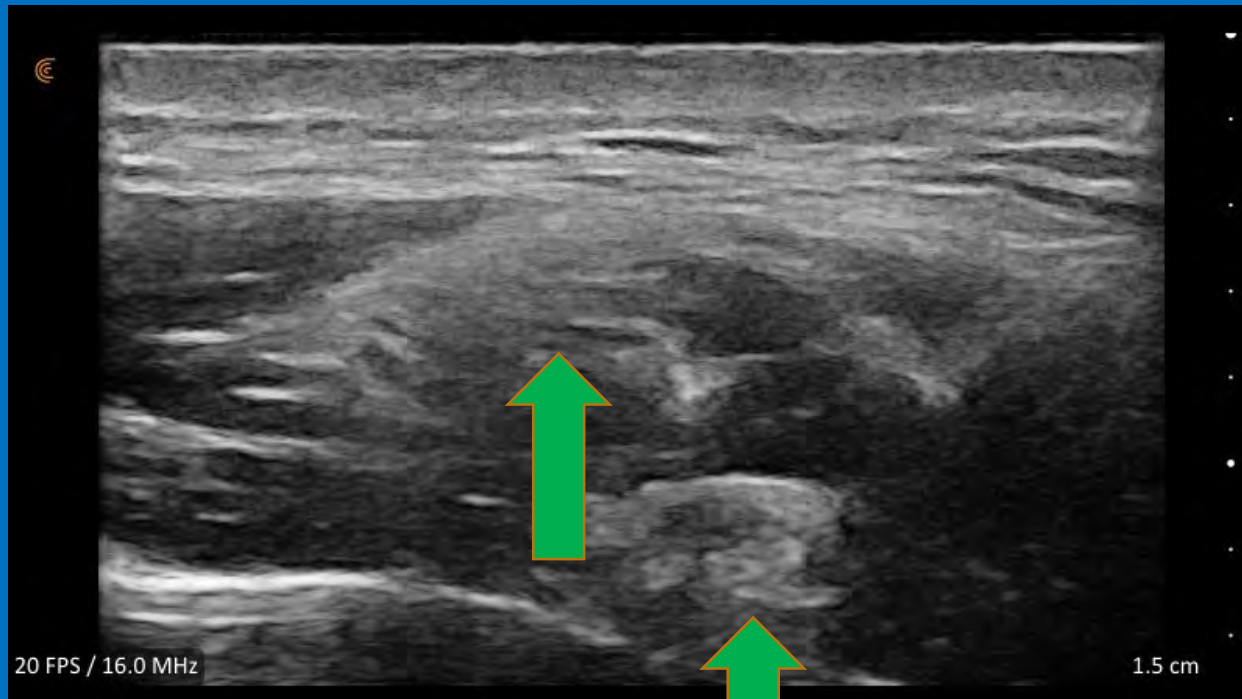
## CALCIUM HYDROXYAPATITE (CAHA)

- Calcium Hydroxyapatite (CaHa) –
  - Hyperechoic
  - Appears as small white spheres in band-like deposit
  - Collagen stimulation adds to hyperechoic image
  - Posterior shadowing is artifact seen
  - Hyperdilute CaHa shows cloud of microspheres with injection

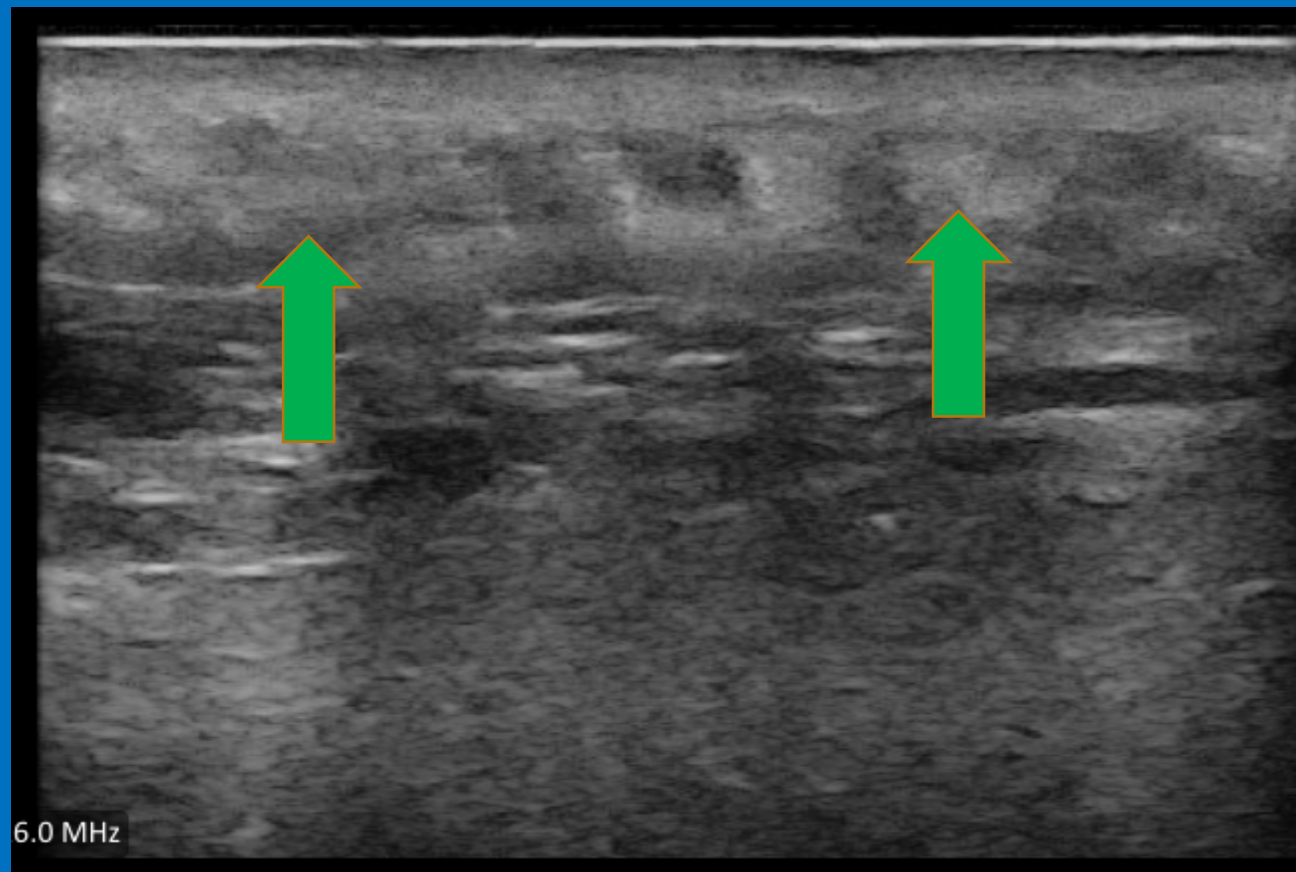
## CAHA DEEP TEMPLE INJECTION



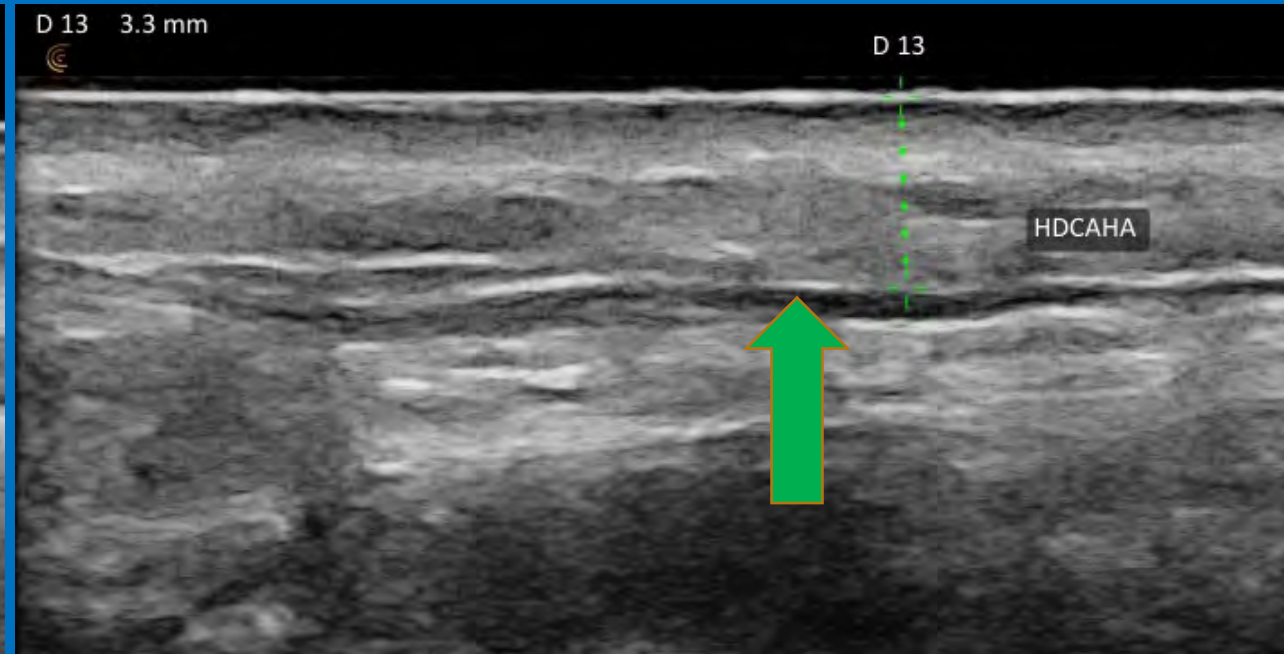
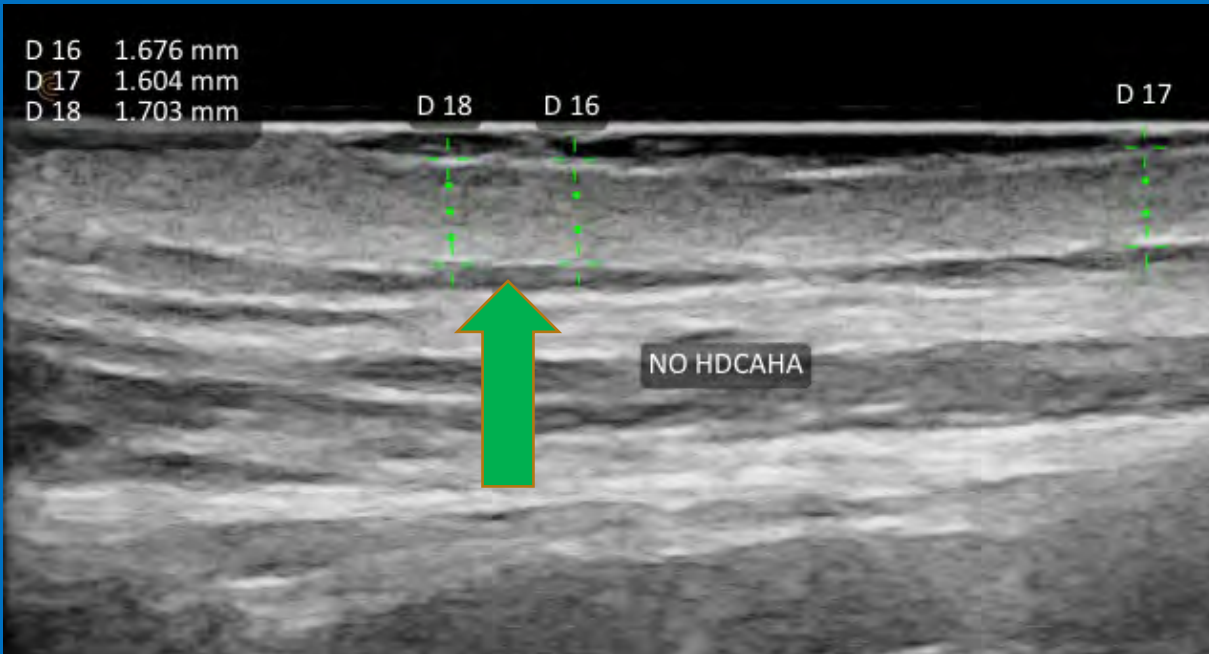
## CAHA IN MASSETER AND CHIN



# HYPERDILUTE CAHA



## HYPERDILUTE CAHA NECK – 3 MONTHS AFTER 2 TREATMENTS

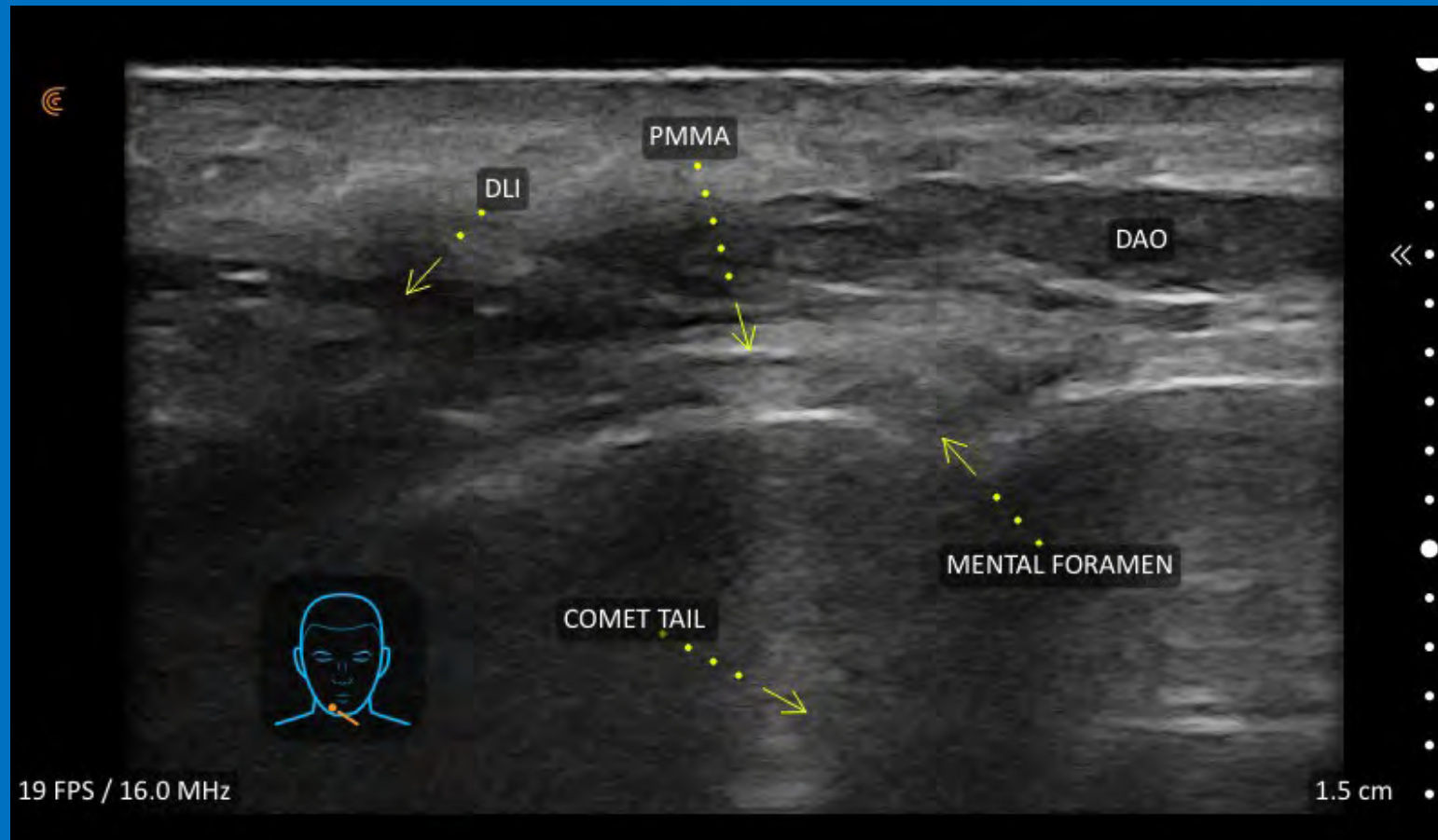


## POLY METHYL METHACRYLATE (PMMA)

- Poly Methyl Methacrylate: PMMA microspheres in collagen
  - Hyperechoic microspheres or bands (collagen)
  - Comet tails are typical artifact seen



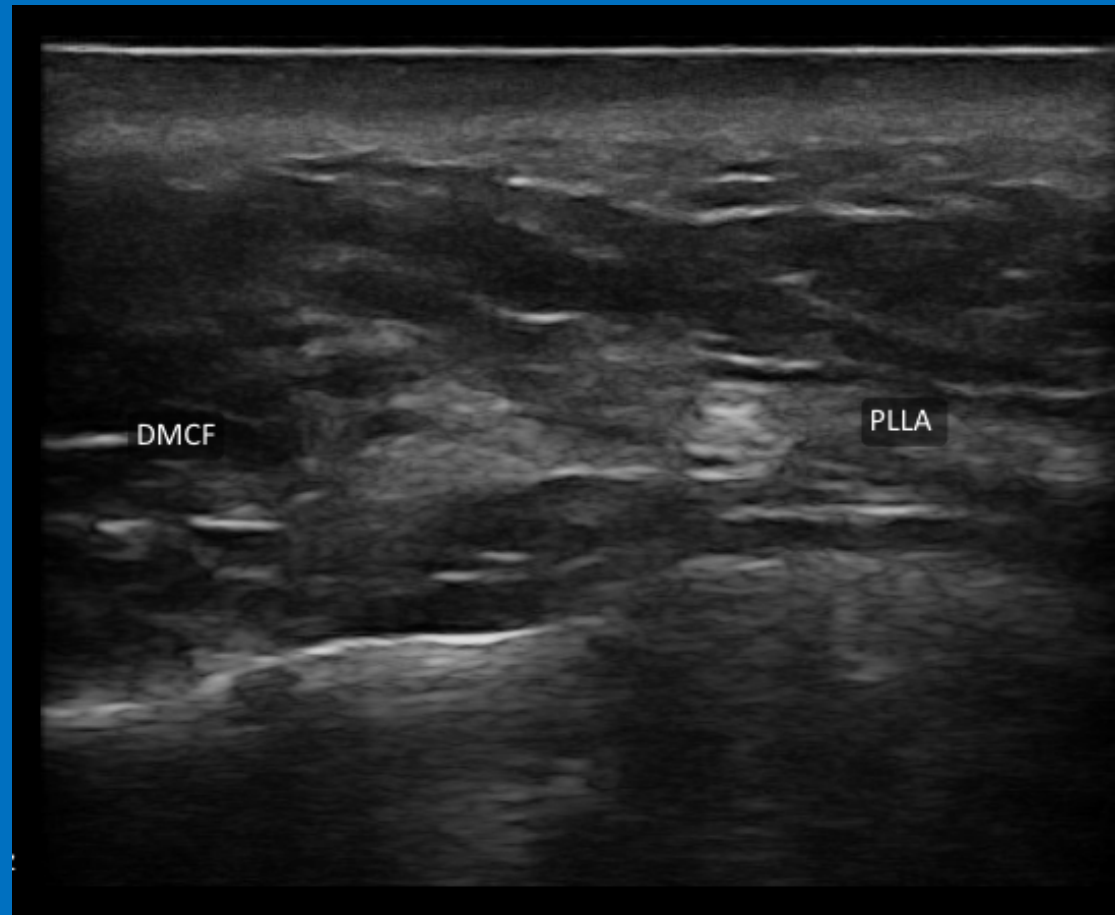
## PMMA ALONG PERIOSTEUM



## POLY L LACTIC ACID (PLLA)

- Poly L Lactic Acid (PLLA): Mixture of water and PLLA
  - Water is quickly absorbed
  - PLLA is hyperechoic and so is collagen when stimulated
  - Appears as a cloud of white shading – diffuse

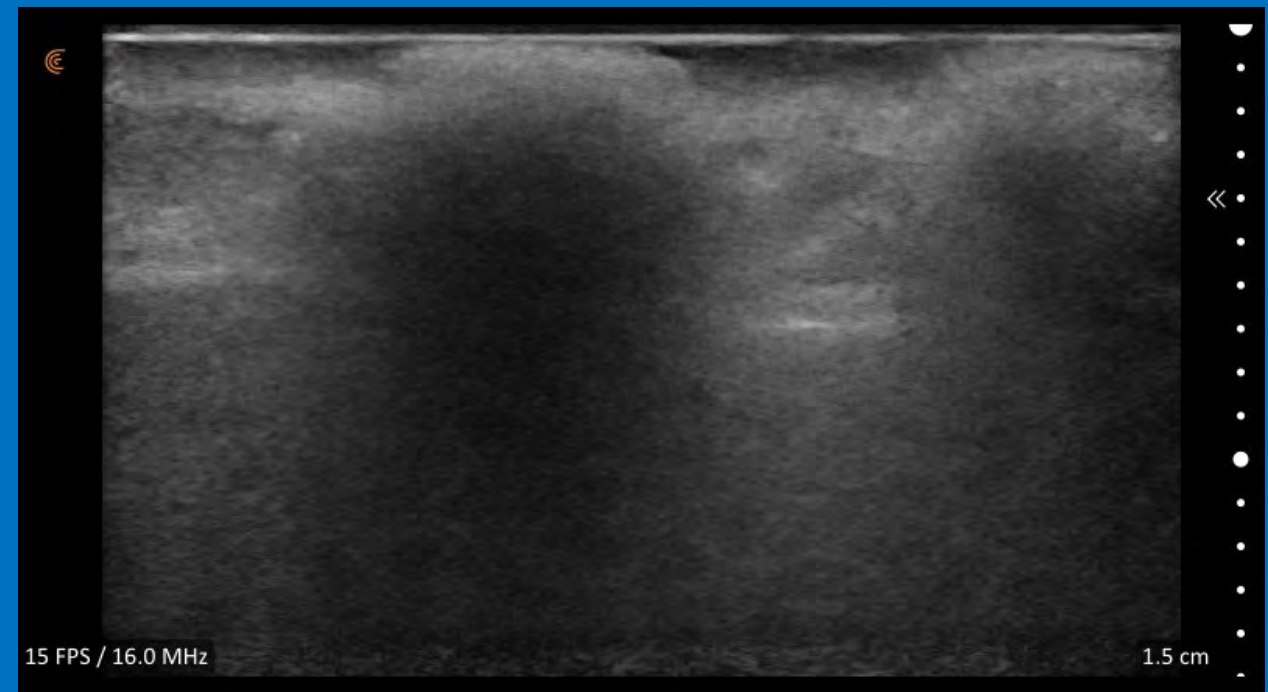
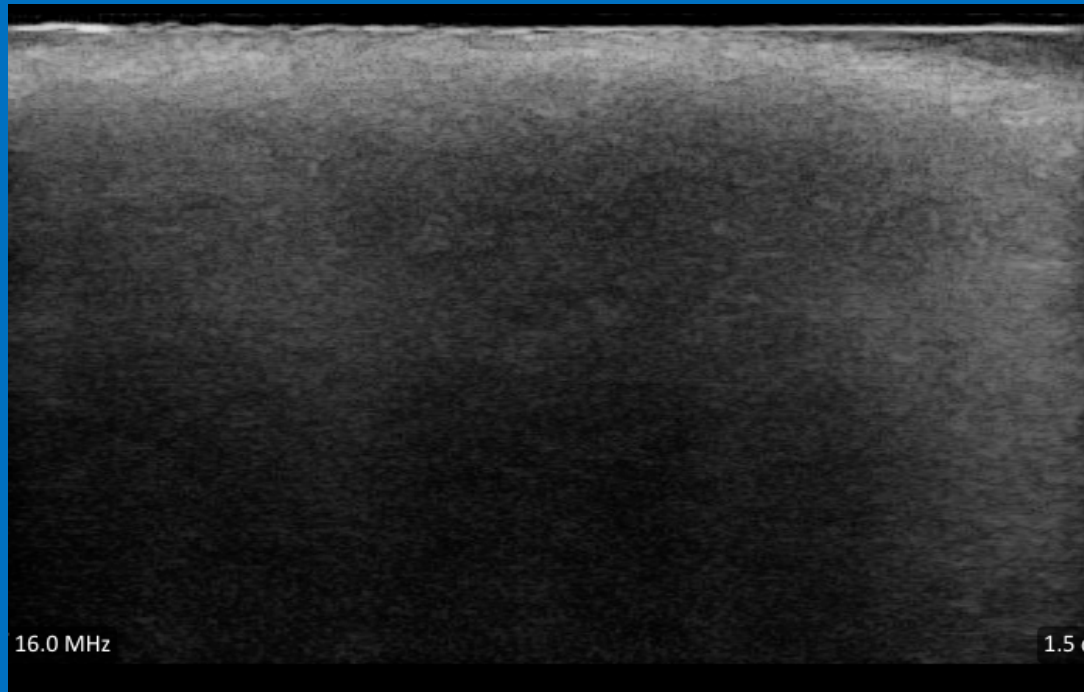
## PLLA IN CHEEK



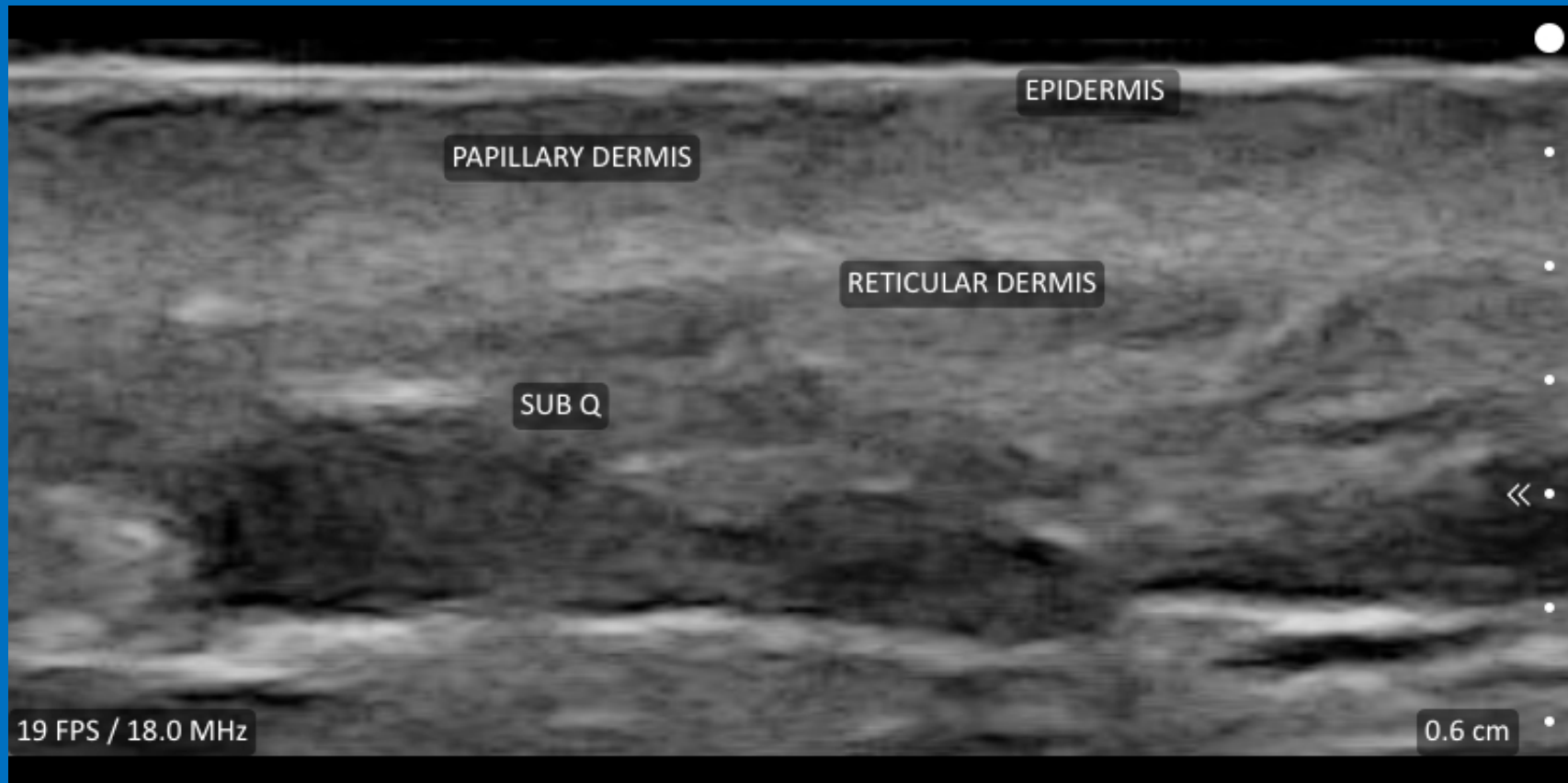
## SILICONE OIL

- Silicone Oil
  - Not approved for filling in US
  - Ill defined hyperechoic diffuse image
  - Posterior reverberation artifact
  - “Snow Storm” classic findings
  - Deeper anatomic structures are difficult or impossible to see

# SILICONE OIL

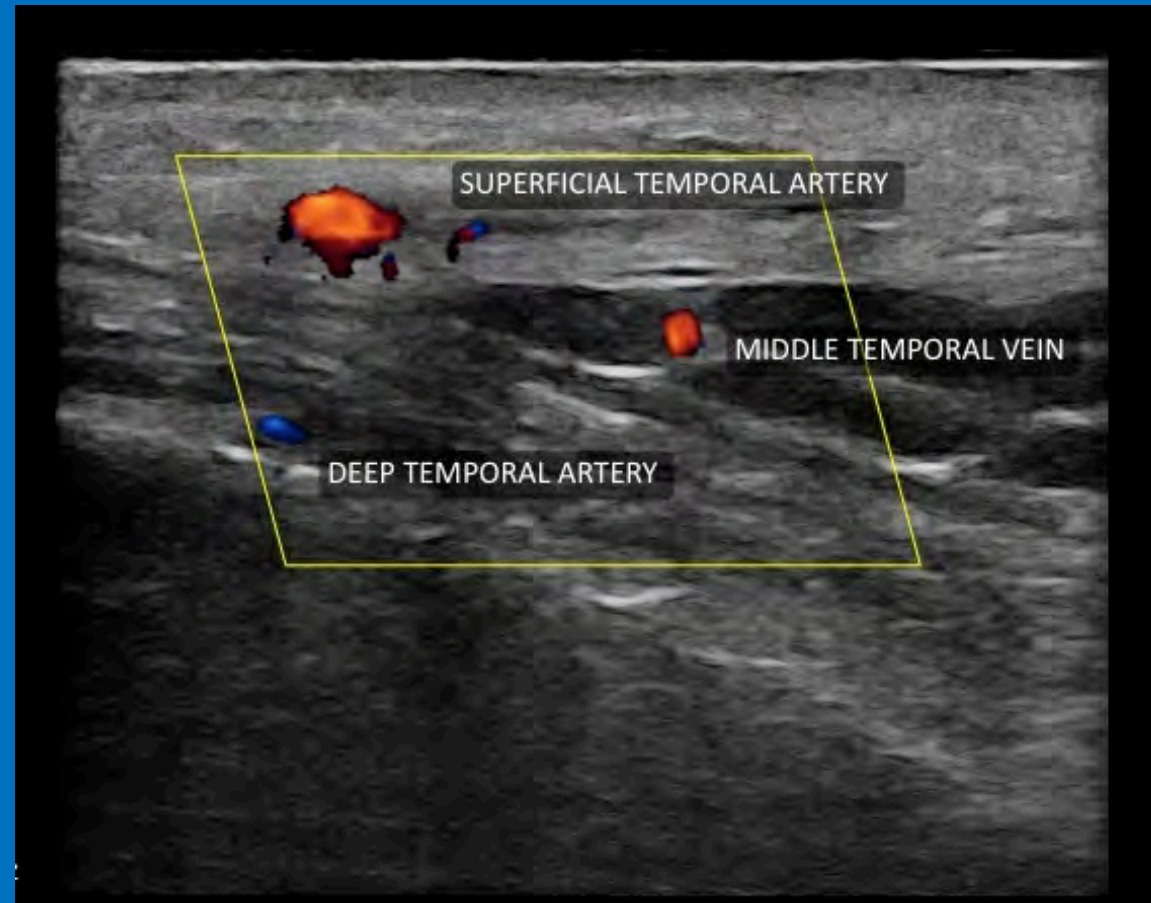


# SKIN ANATOMY WITH ULTRASOUND

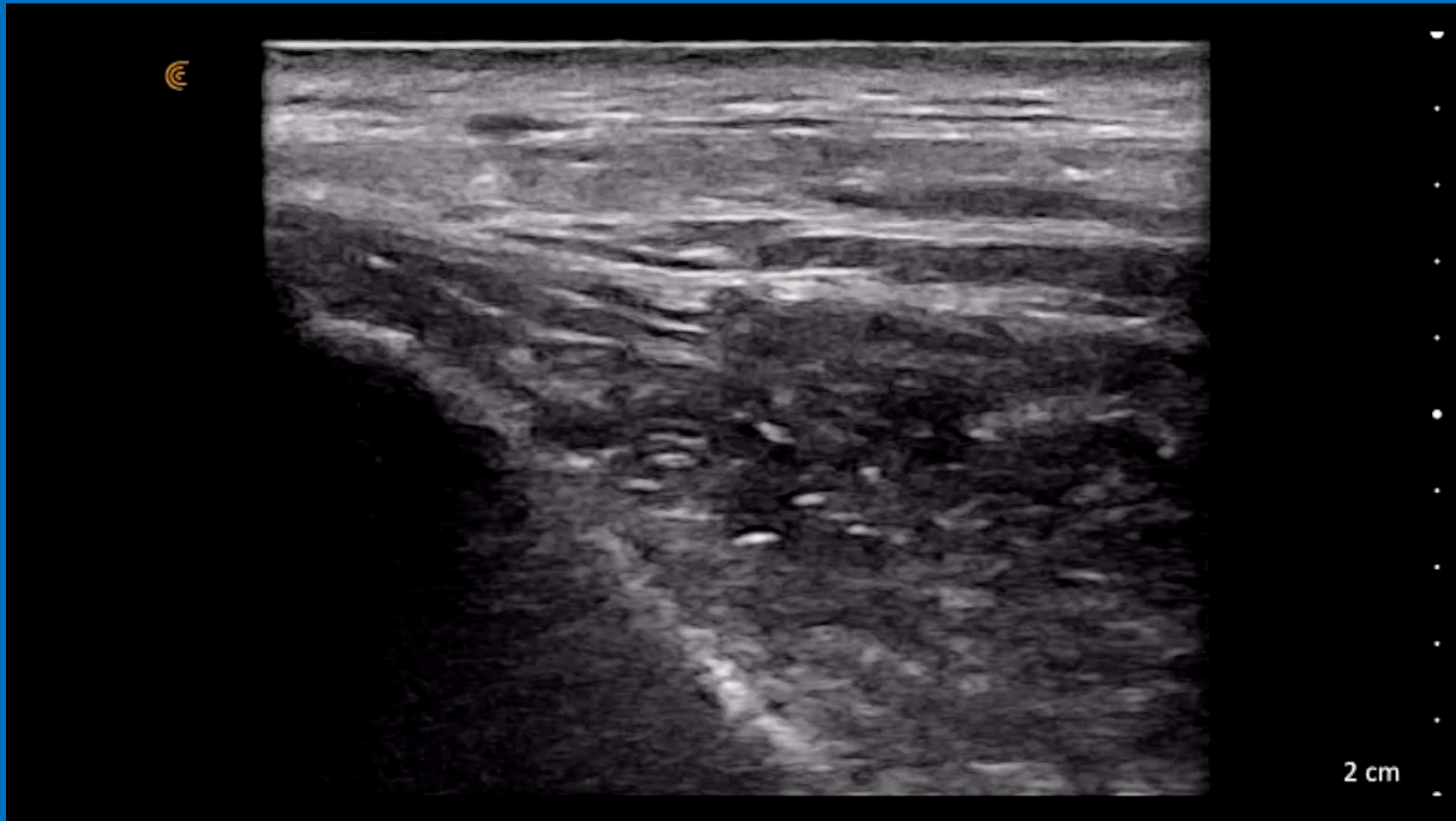




# TEMPLE VASCULAR ANATOMY



# FILLER INJECTIONS

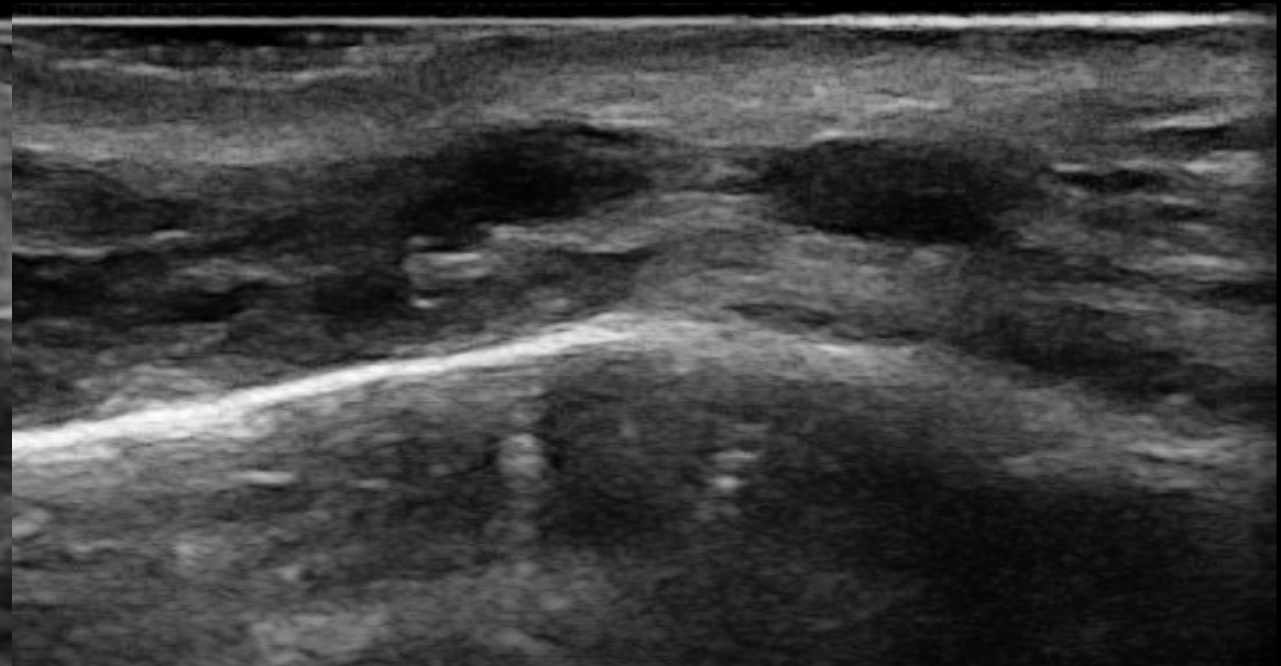
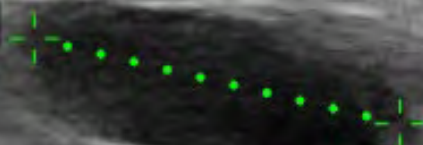


# FILLER COMPLICATIONS

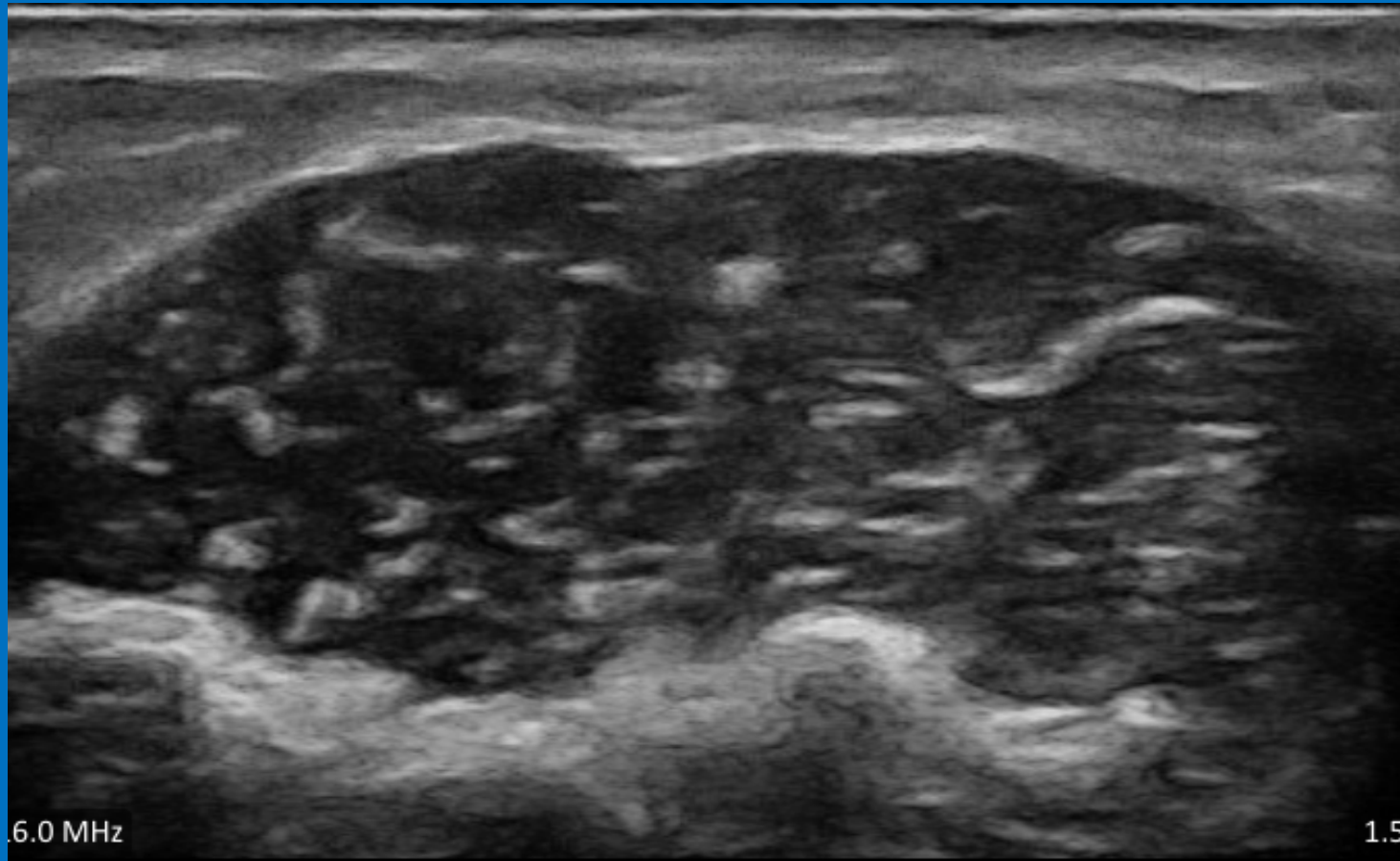
## PLLA NODULES (METHYL CELLULOSE)

D-7 5.424 mm

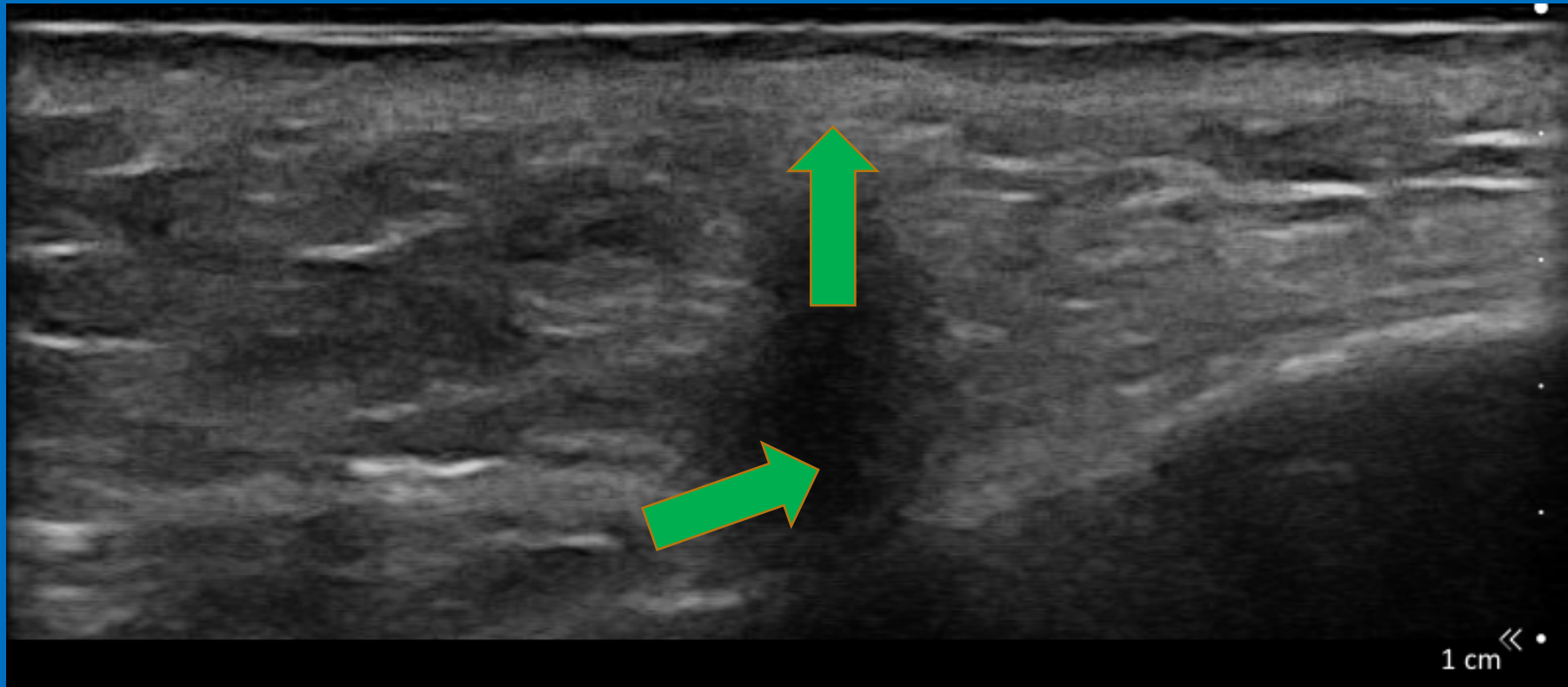
D7



## PLLA LARGE NODULE ARM



## CAHA NODULE



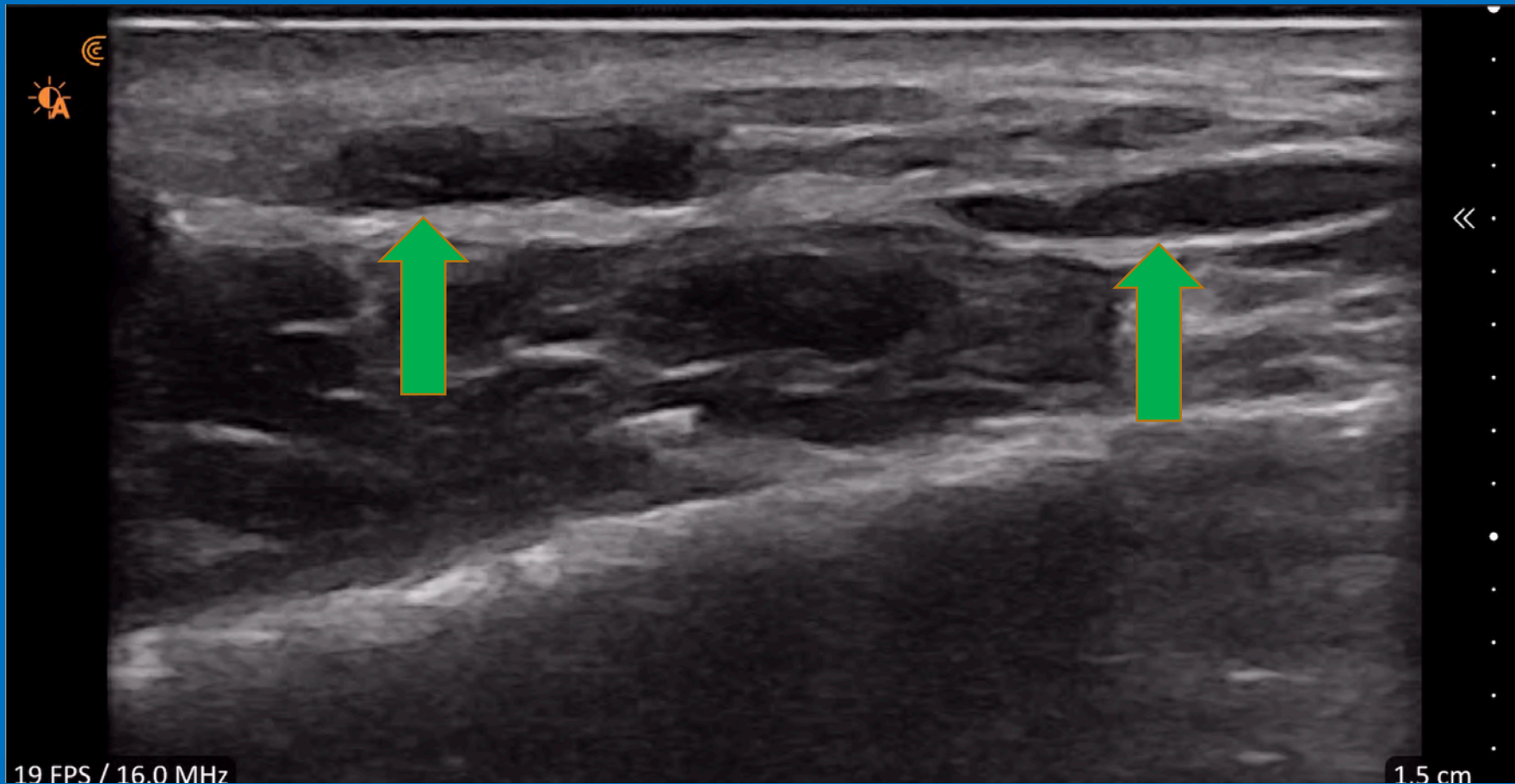


## HA NODULE TYPICAL CHARACTERISTICS

- Larger aggregates of filler
- More rounded than normal filler
- Higher amounts of posterior enhancement
- Can be encapsulated!



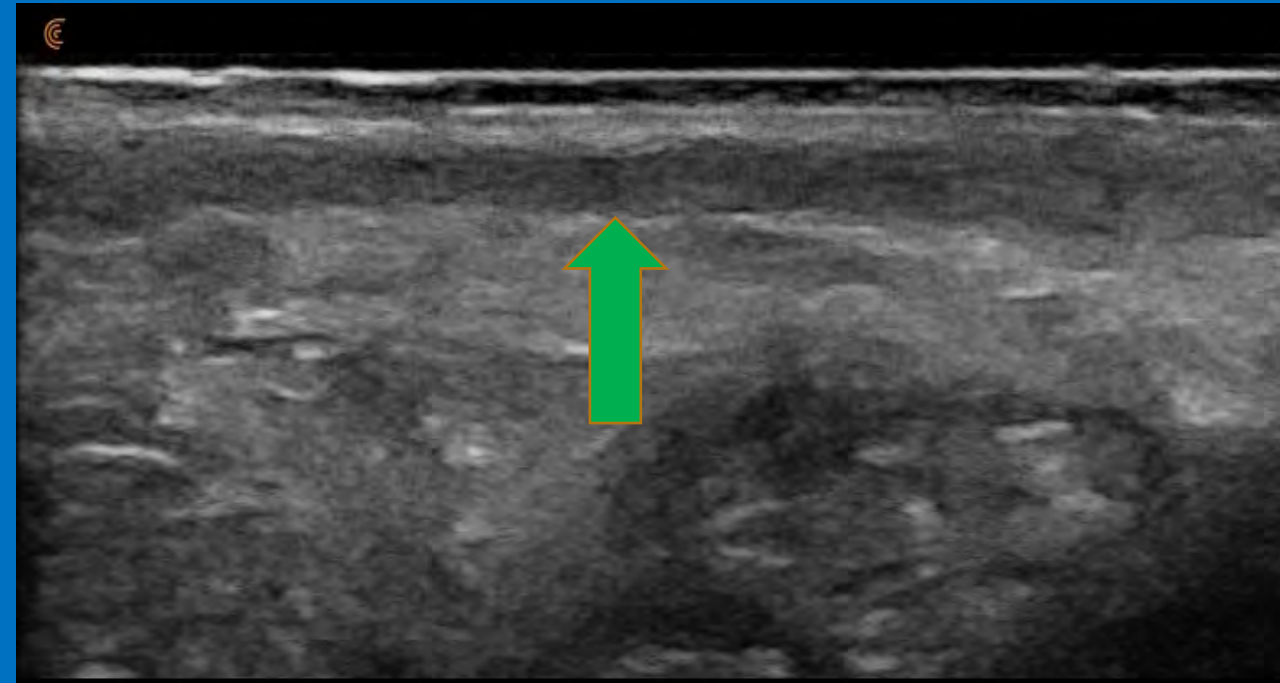
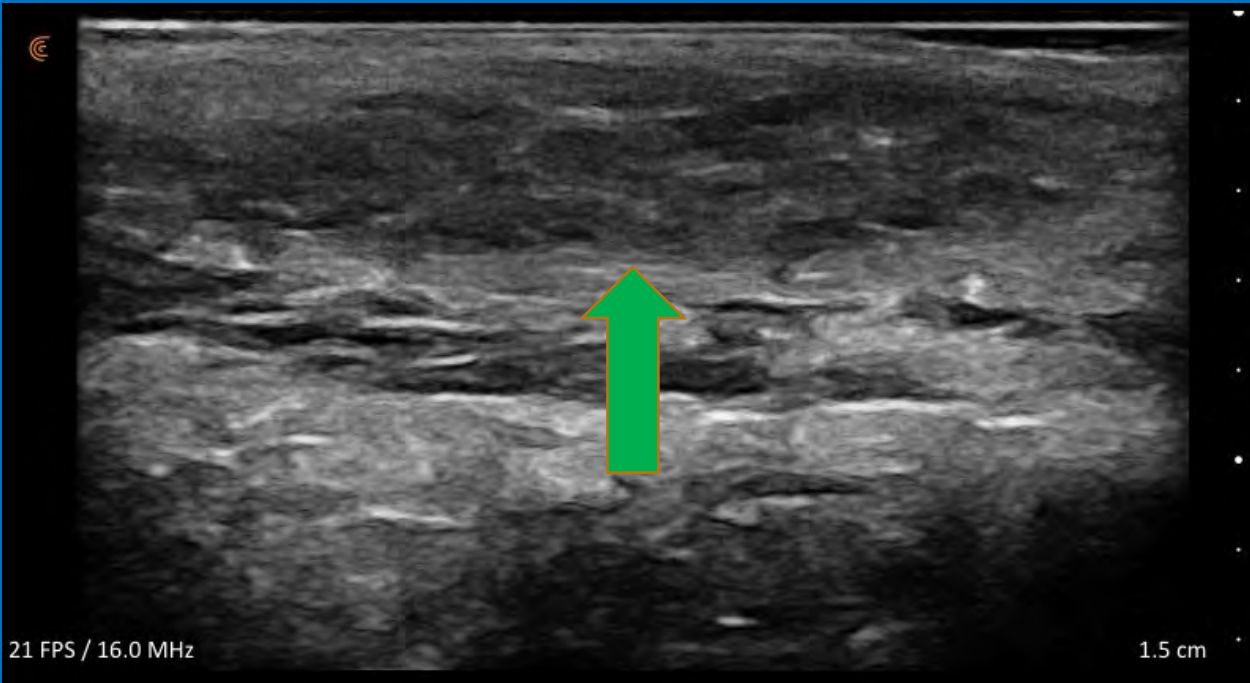
HA IN PREZYGOMATIC SPACE AND ABOVE  
SMAS  
LOOK FOR THIS IN MALAR EDEMA



JUVEDERM 10 YEARS PRIOR TYNDALL EFFECT  
2 TREATMENTS WITH HYALURONIDASE



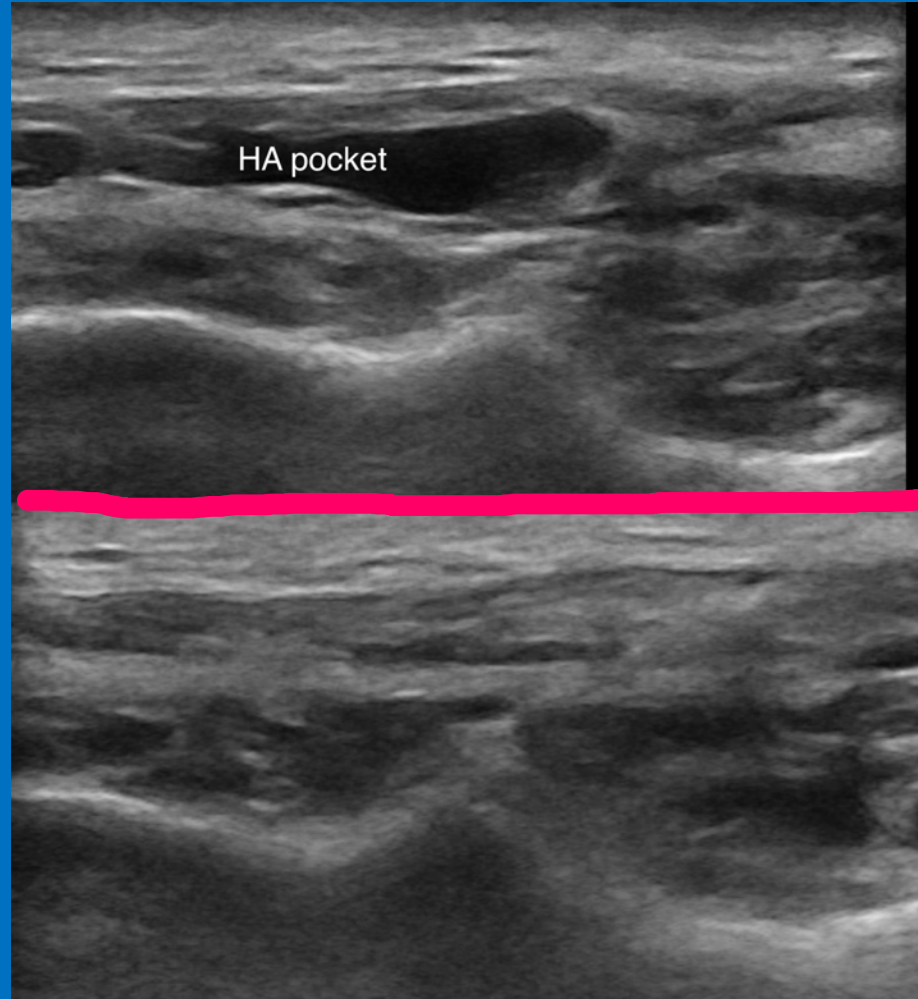
# TYNDALL TREATED WITH HYALURONIDASE







MEDIAL CHEEK/TEAR TROUGH HA POCKET  
– BEFORE AND 24 HOURS AFTER HYLENEX





## SUMMARY

- Ultrasound is extremely valuable in identifying and characterizing fillers
- Filler complications such as nodules, Tyndall, granulomas, and swelling can be evaluated with ultrasound
- Often nodules have a capsule and injections need to be placed precisely into these
- Ultrasound is invaluable in treating vascular occlusions (Dr. Stella Presentation)



# TREATMENT OF VASCULAR OCCLUSION USING ULTRASOUND

STELLA DESYATNIKOVA MD  
THE STELLA CENTER, SEATTLE,  
WA





## ULTRASOUND IN AESTHETICS

- NOT A NEW CONCEPT
- HUGE SURGE IN POPULARITY
- QUICK, NONINVASIVE, PRECISE LOCALIZATION
- IMPROVEMENTS IN TECHNOLOGY AND PRICE
- HELP TO OPTIMIZE SAFETY OF AESTHETIC TREATMENTS



Baribeau Y, Sharkey A, Chaudhary O, Krumm S, Fatima H, Mahmood F, Matyal R. Handheld Point-of-Care Ultrasound Probes: The New Generation of POCUS. J Cardiothorac Vasc Anesth. 2020 Nov;34(11):3139-3145

Schelke LW, Van Den Elzen HJ, Erkamp PP, Neumann HA. Use of ultrasound to provide overall information on facial fillers and surrounding tissue. Dermatol Surg. 2010 Nov;36 Suppl 3:1843-51





# VASCULAR OCCLUSION

- DREADED COMPLICATION OF FILLER INJECTIONS
- 3.4 MLN FILLER INJECTIONS IN 2020, ASPS
- TRUE INCIDENCE OF OCCLUSION UNKNOWN
- ABOUT 1/3 -1/2 OF INJECTORS WILL HAVE AT LEAST ONE IN 10 YEARS
- DeLORENZI PROTOCOL - HIGH DOSE HYALURONIDASE PULSE TREATMENT
- EXPENSE, ANXIETY, PAIN, UNCERTAINTY
- DOES IT ALWAYS WORK? AND IS THERE A BETTER WAY?

DeLorenzi C. New High Dose Pulsed Hyaluronidase Protocol for Hyaluronic Acid Filler Vascular Adverse Events. Aesthet Surg J. 2017 Jul 1;37(7):814-825







## IMAGINE THIS SITUATION

- LIP AND CHIN INJECTION
- 28 VIALS OF HYALURONIDASE
- THE PATIENT AND INJECTOR HAVE BEEN UP ALL NIGHT
- STILL WITH OCCLUSION SYMPTOMS
- CAN YOU FIX THIS?





# NOW YOU CAN

ULTRASOUND







## USE OF ULTRASOUND FOR VASCULAR OCCLUSION STEPS OF TREATMENT

- DESCRIBED BY L. SCHELKE
- CLINICAL EXAM – EXTENT OF OCCLUSION
- VASCULAR MAPPING: IDENTIFY AREAS OF NORMAL, ABNORMAL AND ABSENT BLOOD FLOW
- IDENTIFY FILLER IN THE AREAS OF BLOCKED FLOW
- DISSOLVE FILLER – SMALL TARGETED INJECTIONS OF HYALURONIDASE
- CHECK THE FLOW – IF NORMAL, OCCLUSION IS REVERSED
- DOCUMENT, DOCUMENT, DOCUMENT

Schelke LW, Velthuis P, Kadouch J, Swift A. Early ultrasound for diagnosis and treatment of vascular adverse events with hyaluronic acid fillers. J Am Acad Dermatol. 2019 Jul 17:S0190-9622(19)32392-8







## STEP 1 - CLINICAL EXAM

- ESTABLISH AREA OF OCCLUSION – MARBLED OR LIVEDOID SKIN DISCOLORATION, PERSISTENT PALE AREAS
- CHECK CAPILLARY REFILL
- IN THIS CASE TWO AREAS OF DELAYED CR – RIGHT LOWER LIP AND RIGHT PYRIFORM







## STEP 2 - ULTRASOUND EXAM

- VASCULAR MAPPING
- AFFECTED AREAS AND VASCULAR TRIBUTARIES
- FIND THE AREAS OF ABNORMAL FLOW
- LOOK FOR FILLER IN THESE AREAS
- MARK ON THE SKIN
- CONFIRMED WITH L .SCHELKE OVER VIRTUAL CONNECTION







16 FPS / 16.0 MHz

## ULTRASOUND EXAM

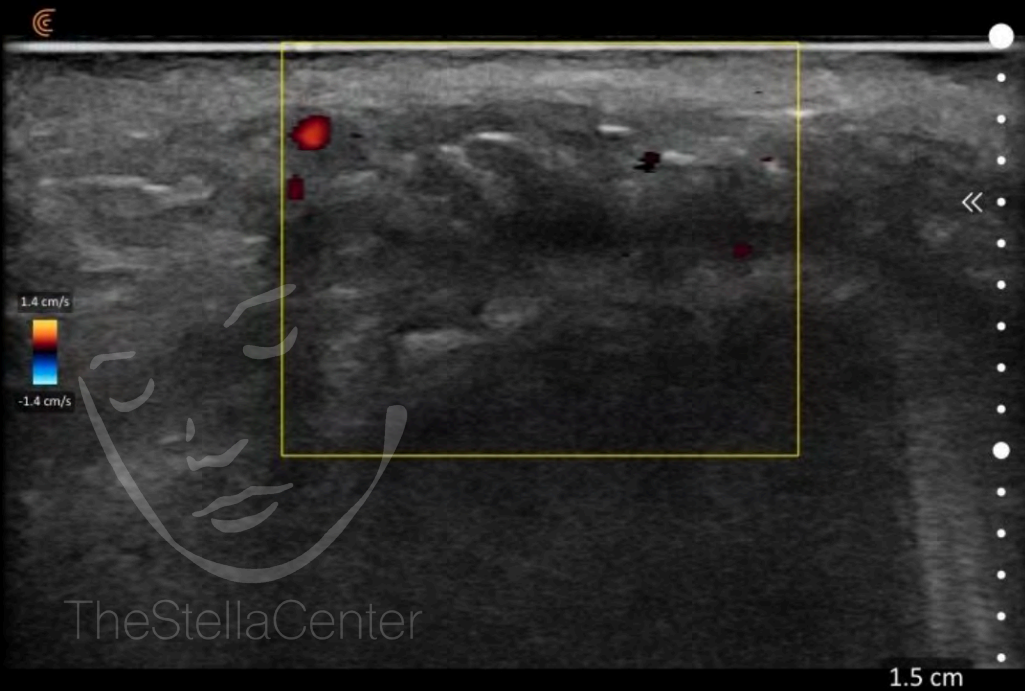
- ARTERIAL FLOW DIMINISHED IN THE LOWER LIP, CHIN, AND FACIAL ARTERY
- FILLER DEPOSITS AROUND THE AREAS OF DECREASED FLOW LATERAL TO MODIOLUS AND RIGHT LATERAL CHIN





### STEP 3 - ULTRASOUND GUIDED INJECTION OF HYALURONIDASE

- SMALL AMOUNTS 50-75 UNITS
- TARGETED INJECTIONS
- IN THIS CASE, INJECTED CHIN FIRST WITH MARKED IMPROVEMENT



17 FPS / 16.0 MHz





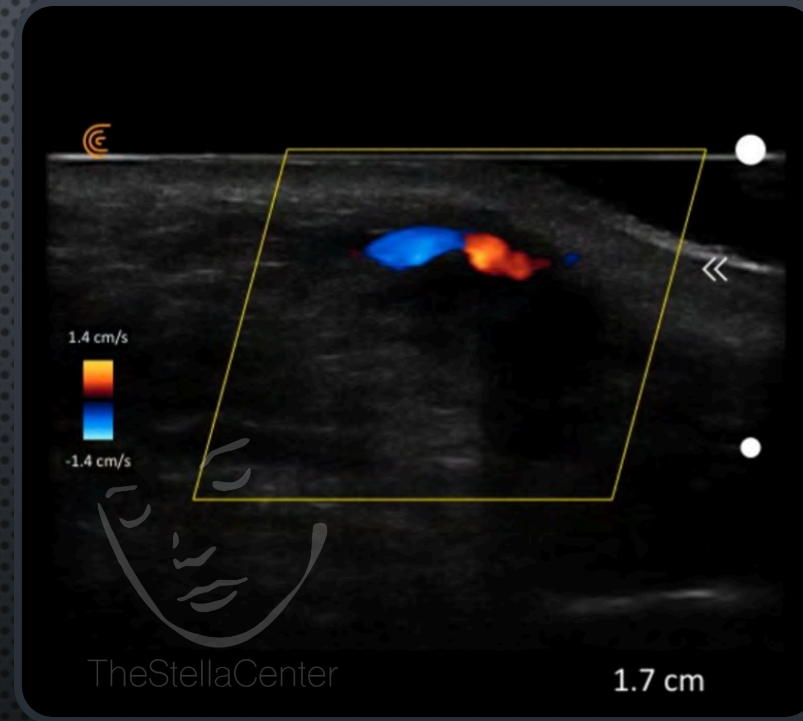
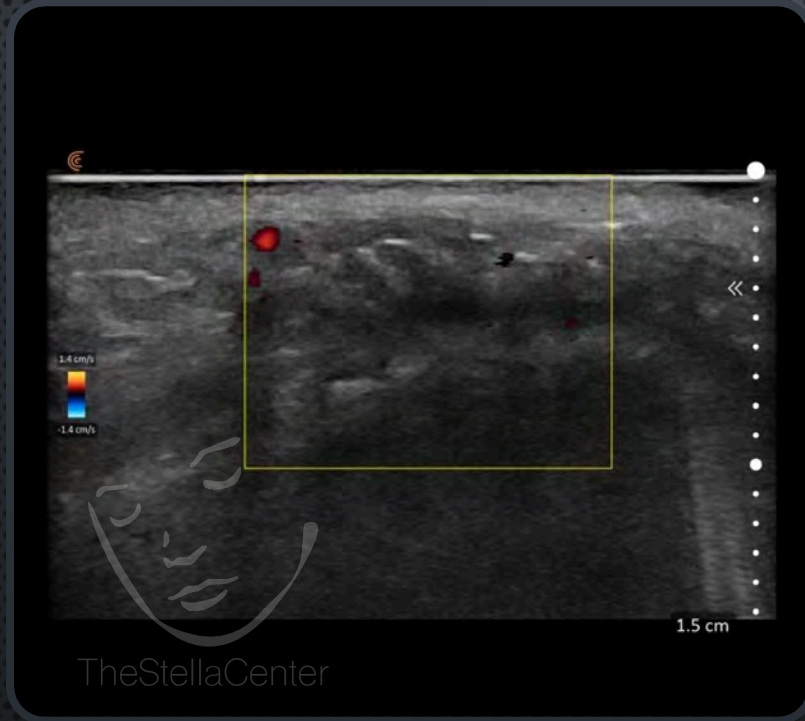
## STEP 4 - REPEAT ULTRASOUND EXAM AFTER SEVERAL MINUTES

- IMMEDIATE IMPROVEMENT OF THE FLOW IN THE CHIN
- IMPROVEMENT OF THE FLOW IN THE FACIAL ARTERY WITHOUT ADDITIONAL HYALURONIDASE AT THAT SPOT
- PERSISTENT DELAYED CAP REFILL AT THE PYRIFORM. ADDITIONAL HYALURONIDASE INJECTION
- IMMEDIATE IMPROVEMENT CLINICALLY AND GOOD FLOW OBSERVED ON ULTRASOUND

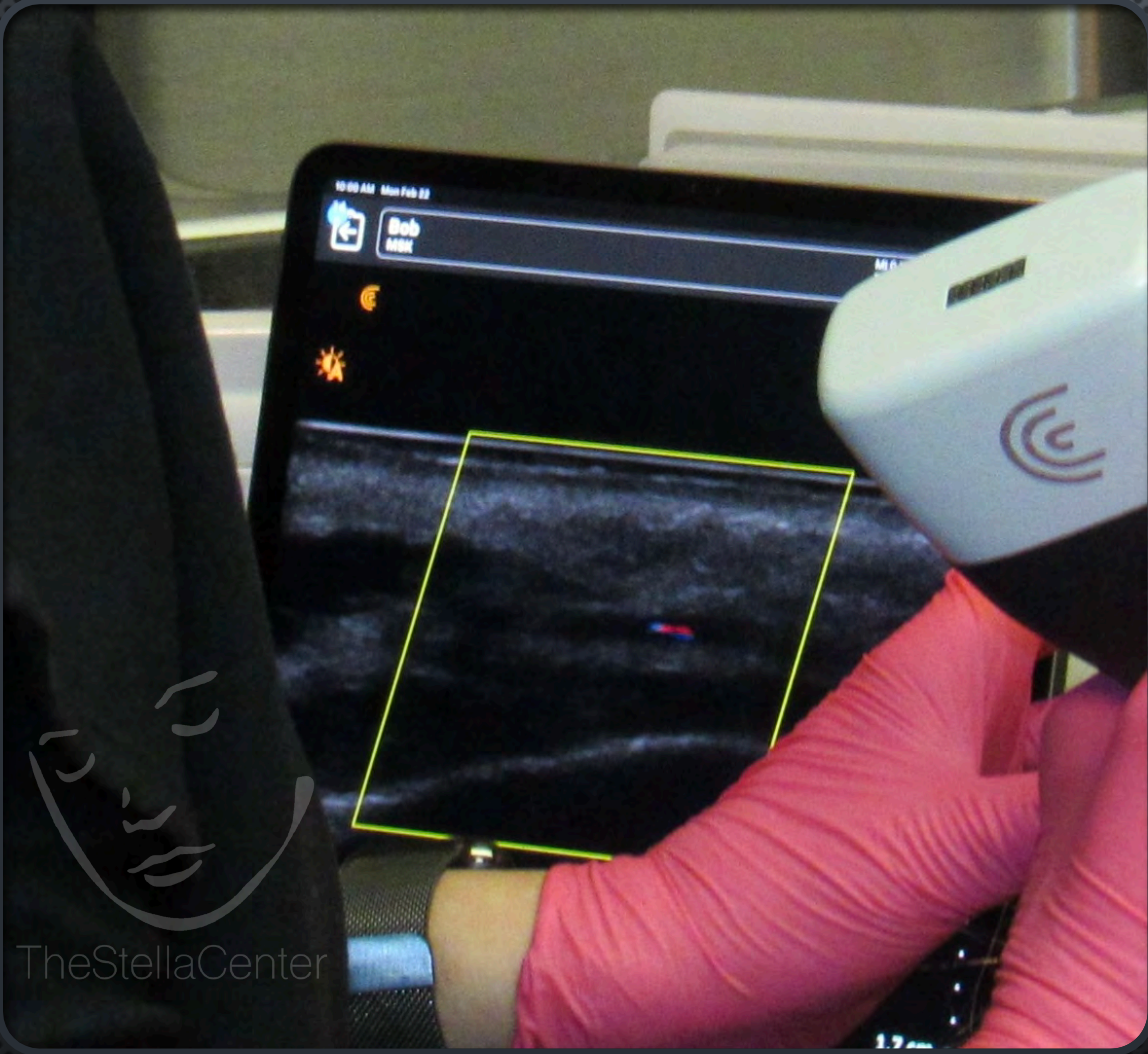




## SUBMENTAL ARTERY – DURING HYALURONIDASE INJECTION AND AFTER DISSOLVING







## LEARNING POINTS

- OCCLUSION CASES AND VASCULAR MAPPING MAY TAKE A LONG TIME
- PORTABLE DEVICES HEAT UP, BATTERY RUNS OUT. BE PATIENT
- GET PREPARED — EXTRA BATTERY, FAN IF AVAILABLE
- MARK THE OCCLUSION SPOT ON SKIN, IN CASE YOU NEED TO STOP AND RESTART
- DISSOLVE FILLER IN THE AREA OF THE ABNORMAL OR ABSENT FLOW
- ONCE THE FLOW IS NORMAL, YOU MAY SEND THE PATIENT HOME, BUT RECHECK THE NEXT DAY







## CASE NUMBER 2

- HA FILLER, NEEDLE INJECTION AT THE PYRIFORM SPACE
- 49 VIALS OF HYALURONIDASE OVER 2 DAYS
- PT FLEW TO SEATTLE 2 DAYS LATER
- CLINICAL ASSESSMENT – AREAS OF DELAYED CAPILLARY REFILL, LIVEDOID DISCOLORATION
- US VASCULAR MAPPING - DECREASED FLOW LEFT ANGULAR, SUPERIOR LABIAL, LATERAL NASAL
- HYALURONIDASE INJECTION IN TWO AREAS, 75 UNITS EACH
- NEXT DAY – NEW AREAS OF LIVEDO, FOREHEAD AND GLABELLA. US EXAM AND ADDITIONAL HYALURONIDASE, 75 U AT THE GLABELLA





## AREAS OF TARGETED HYALURONIDASE INJECTION

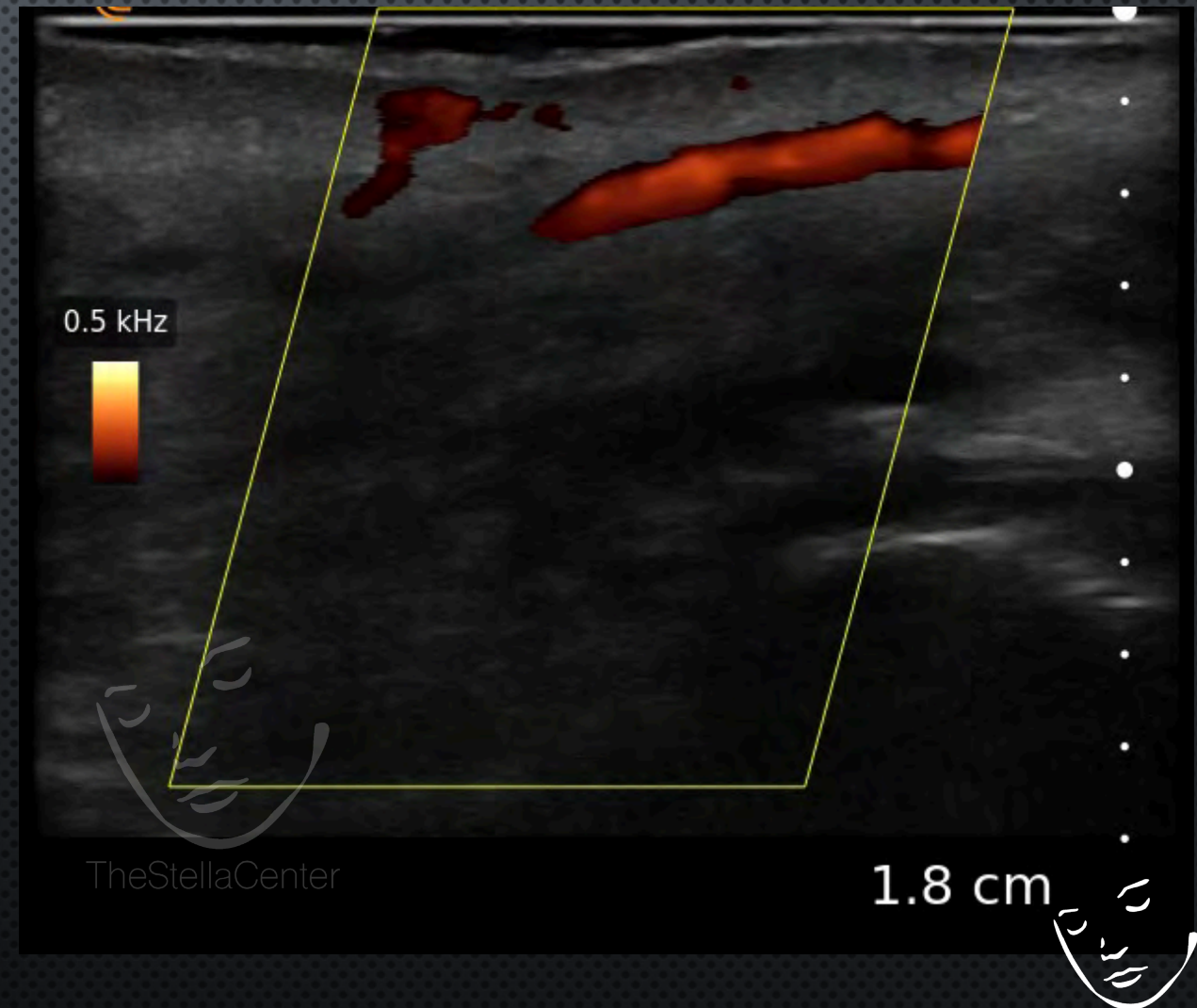
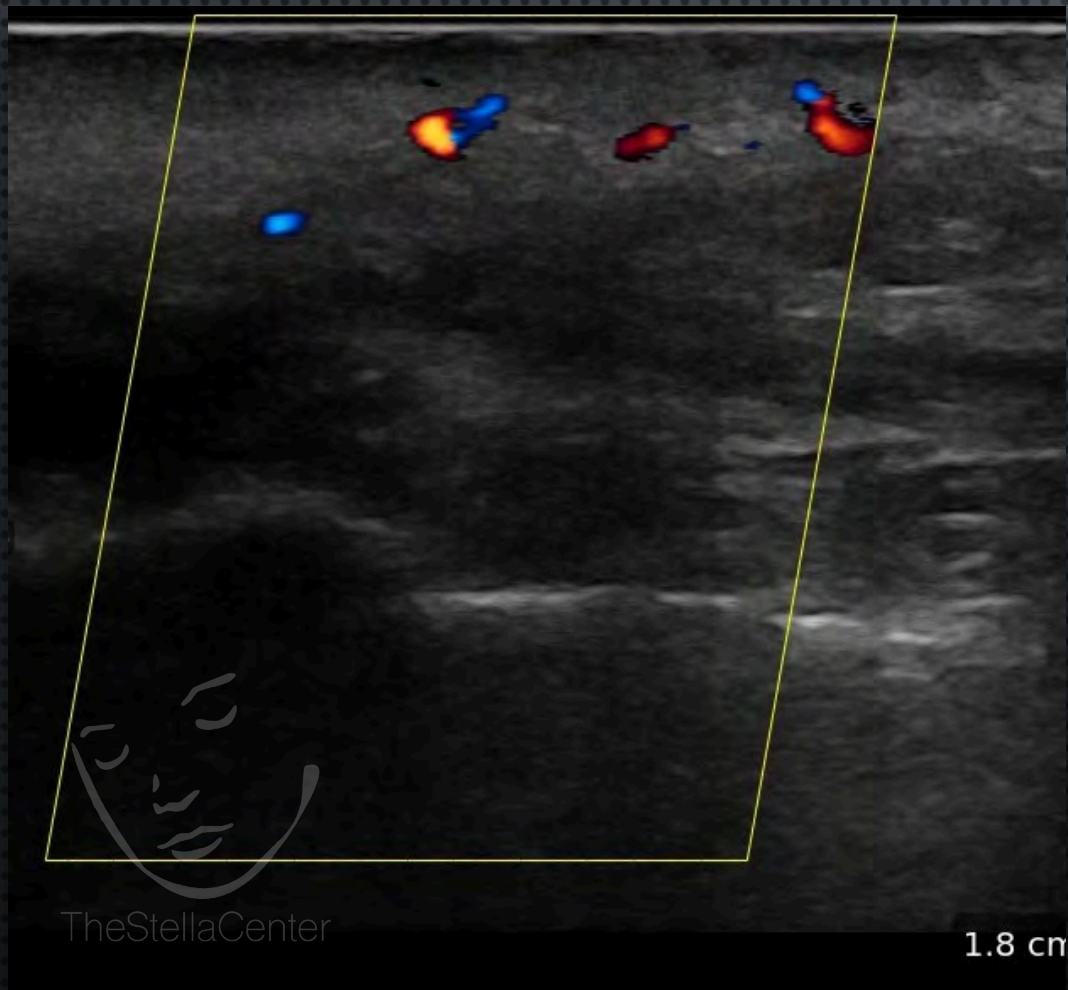


- FILLER DEPOSITS AT LEFT NASOFACIAL GROOVE AND MEDIAL LEFT CHEEK
- DISSOLVING THESE TWO DEPOSITS - 0.5 CC 75 UNITS HYALURONIDASE EACH



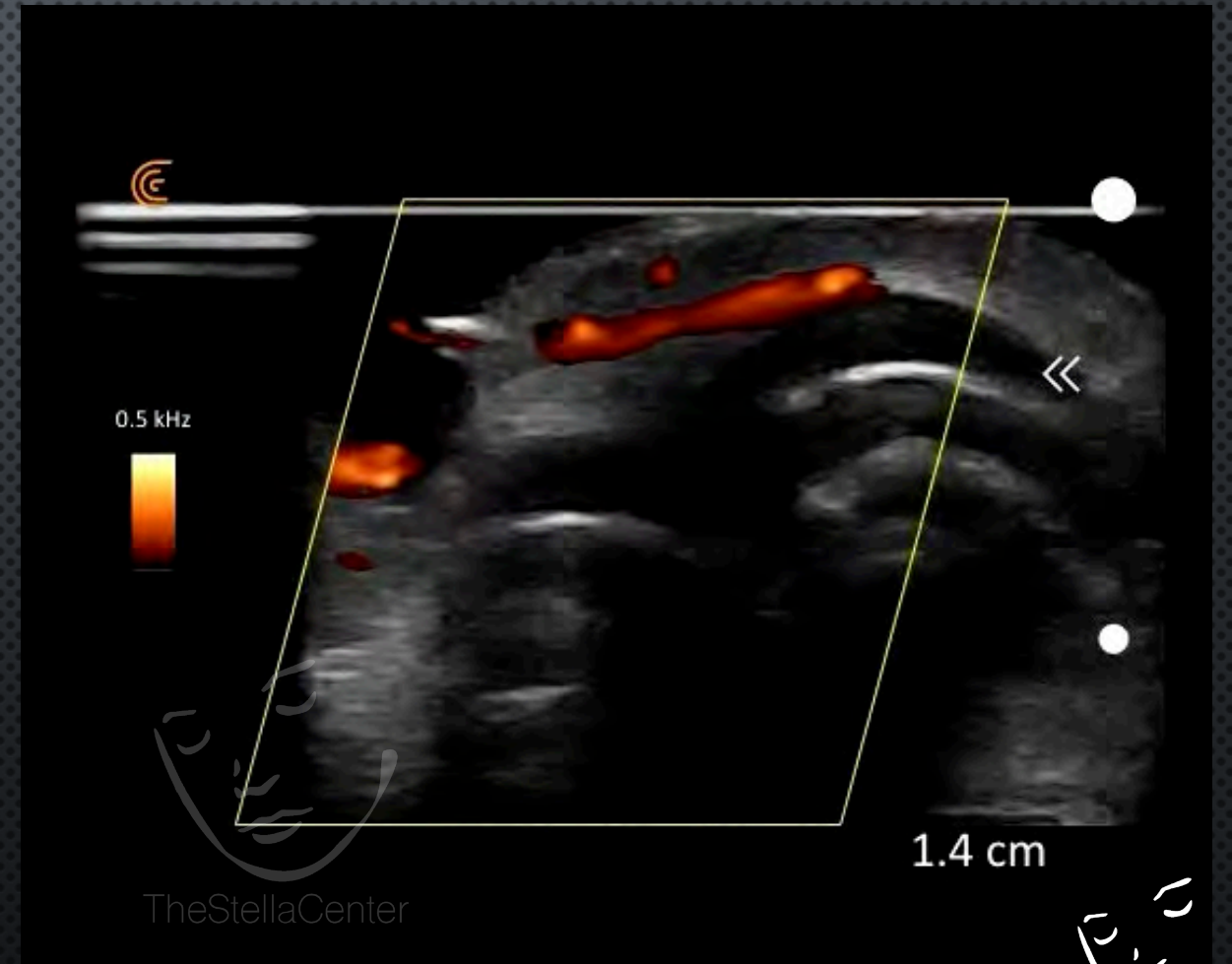


# ANGULAR ARTERY – BEFORE AND AFTER DISSOLVING





# LATERAL NASAL ARTERY – BEFORE AND AFTER DISSOLVING







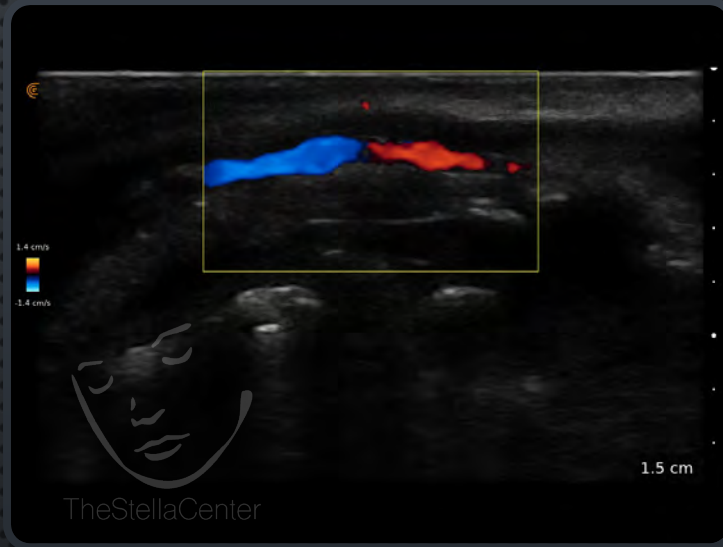
## CHANGES IN BLOOD FLOW AFTER HYALURONIDASE INJECTION

RECORDED OVER 15-20 MINUTES AFTER INJECTION





## CONSIDERATIONS



- VASCULAR OCCLUSION IS NOT AN EMERGENCY (OTHER THAN BLINDNESS)
- YOU HAVE UP TO THREE DAYS BEFORE IRREVERSIBLE CHANGES OCCUR
- IF OCCLUSION IS REVERSED, THE FLOW COMES BACK QUICKLY
- ALWAYS SEE YOUR PATIENT THE NEXT DAY. NEW AREAS OF ISCHEMIA MAY DECLARE THEMSELVES OVERNIGHT
- PORTABLE DEVICES HAVE ISSUES — GET HEATED, BATTERY RUNS OUT. BE PREPARED
- HAVING A DEVICE IS NOT YOUR GET OUR JAIL CARD IF YOU DON'T KNOW HOW TO USE IT
- ALWAYS CORRELATE CLINICALLY
- LEARNING CURVE — STEEP INITIALLY, TRAINING CAN BE IMMENSELY HELPFUL







## IN CONCLUSION

- ULTRASOUND CAN BE USED FOR TREATING OCCLUSION
- BEST USE IS TO PREVENT OCCLUSIONS — VASCULAR MAPPING PRIOR TO FILLER INJECTIONS
- UNPRECEDENTED AMOUNT OF INFORMATION FOR OUR TREATMENTS
- LEARNING CURVE CAN BE IMPROVED WITH TRAINING AND PRACTICE
- BE PREPARED AND PRACTICE BEFORE YOUR EMERGENCY!



# LIVE DEMO: How to Visualize Existing Fillers

# 5 Ways Ultrasound Can Help Your Practice

1. *Improving patient safety with vascular mapping.*
2. *Mitigate the risk of filler complications.*
3. *Solve complications with real-time imaging.*
4. *Increase patient confidence with high-definition imaging.*
5. *Increase billings and referrals.*



## Ardis Schmitt, RN, BSN

Revive Medical Spa

“ I received my Clarius L20 Ultrasound about 4 weeks ago and set it up in about 10 minutes. I received a thorough training session virtually where all my questions were answered. Since that time, I’ve used my new L-20 to rule out a potential occlusion, evaluate and baseline depth and position of client vessels in areas of injection, evaluate the depth and position of my cannula and old filler for dissolving, evaluate malar edema post COVID-19 vaccine, and even checked the depth and position of threads at follow up with a client. It seems every week I find myself reaching for my ultrasound to take a look at all the things I couldn’t see before! This device is a key differentiator with our clients and for our practice in safety and evaluation. ”





# Clarius L20 HD

*Wireless Freedom*

*High-Definition Imaging*

*Easy App for iOS & Android*

*Dedicated Aesthetic Presets*

*Affordable Scanner*

*No Subscription Fees*

*Free Clarius Cloud*

*Unlimited Users*



# Questions?



*Dr. Steven  
F. Weiner*



*Dr. Stella  
Desyatnikova*



*Thank you!*