

ULTRASOUND – TEMPORAL ARTERY DOPPLER

PURPOSE:

To evaluate temporal and other central arteries for vasculitis (Giant Cell Arteritis).

SCOPE:

Applies to all US Doppler studies of the temporal arteries performed in Imaging Services / Radiology

INDICATIONS:

- Signs or symptoms of temporal arteritis (Headaches, vision loss, jaw pain, fever, fatigue and weakness).
- Abnormal lab values indicating vasculitis (eg. increased ESR, LFTs, Alk phos, IgG, complement)
- Prior history of vasculitis, polymyalgia rheumatic or other rheumatologic condition
- Abnormal findings on prior imaging

CONTRAINDICATIONS:

- No absolute contraindications

EQUIPMENT:

- Linear array transducer with frequency ranges greater than 9MHz. Small footprint (hockey stick) transducer may be helpful

PATIENT PREPARATION:

- None

EXAMINATION:

GENERAL GUIDELINES:

A complete examination includes bilateral temporal arteries, axillary arteries, and mid common carotid arteries (CCAs). If complete carotid artery evaluation is needed, a dedicated US Carotid order may be required **and performed on a different day.**

EXAM INITIATION:

- Introduce yourself to the patient/family
- Verify patient identity using patient name and DOB
- Explain test
- Obtain patient history including symptoms. Enter and store data page
- Place patient in supine position.

TECHNICAL CONSIDERATIONS:

- Review any prior imaging.
- One of the most important signs is the “hypoechoic halo”, a rim of uniform, ill-defined hypoechoic surrounding a long segment of the artery.
- The halo may be best demonstrated with compressions.
- A halo thickness (from intimal to media) of 0.4 mm is sensitive though not specific. A thickness of 1.0 mm is highly predictive of arteritis.
- Another important finding is areas of stenosis, which can be seen as areas of luminal narrowing with associated color Doppler aliasing. Occlusion can also be seen. This may be difficult to distinguish from atherosclerosis.

- Color Doppler can be used to assess for areas of aliasing (turbulent flow).
- If focal narrowing identified, spectral waveform with PSV prior to and at the stenosis should be measured.
- Affected vessels may be significantly tortuous. This should be noted in Tech
- Although temporal arteries are classically affected, other “central” arteries including axillary and carotid arteries can also be affected and should be evaluated as detailed below.

DOCUMENTATION (For RIGHT and LEFT):

*Anatomy	Grey Scale	Color Doppler	Compression Still & Cine	Waveform	PSV
Routine Temporal Artery Duplex Bilateral					
Temporal Artery transverse: proximal	x	x	x		
Temporal Artery transverse: mid	x	x	x		
Temporal Artery transverse: distal	x	x	x		
Temporal Artery bifurcation transverse: <i>label “F” and “P”</i>	x	x	x		
Temporal Artery, Frontal Branch, prox, transverse	x	x	x		
Temporal Artery, Frontal Branch, distal, transverse	x	x	x		
Temporal Artery, Parietal Branch, transverse	x	x	x		
Temporal Artery longitudinal: proximal*	x	x		x	x
Temporal Artery longitudinal: mid	x	x		x	x
Temporal Artery longitudinal: distal*	x	x		x	x
Frontal Artery longitudinal: proximal	x	x		x	x
Frontal Artery longitudinal: distal	x	x		x	x
Parietal Artery longitudinal: proximal	x	x		x	x
CCA transverse: proximal	x	x			
CCA longitudinal: proximal	x	x		x	x
Axillary Artery transverse: mid	x	x			
Axillary Artery longitudinal: mid	x	x		x	x
Stenosis, if found%	x	x		x	x%
<p>*Only needed if Temporal Artery is very long and/or tortuous Suggested preset: Thyroid preset is effective for this exam</p> <p>% If stenosis identified, spectral Doppler with PSV prior to and at stenosis is needed</p>					

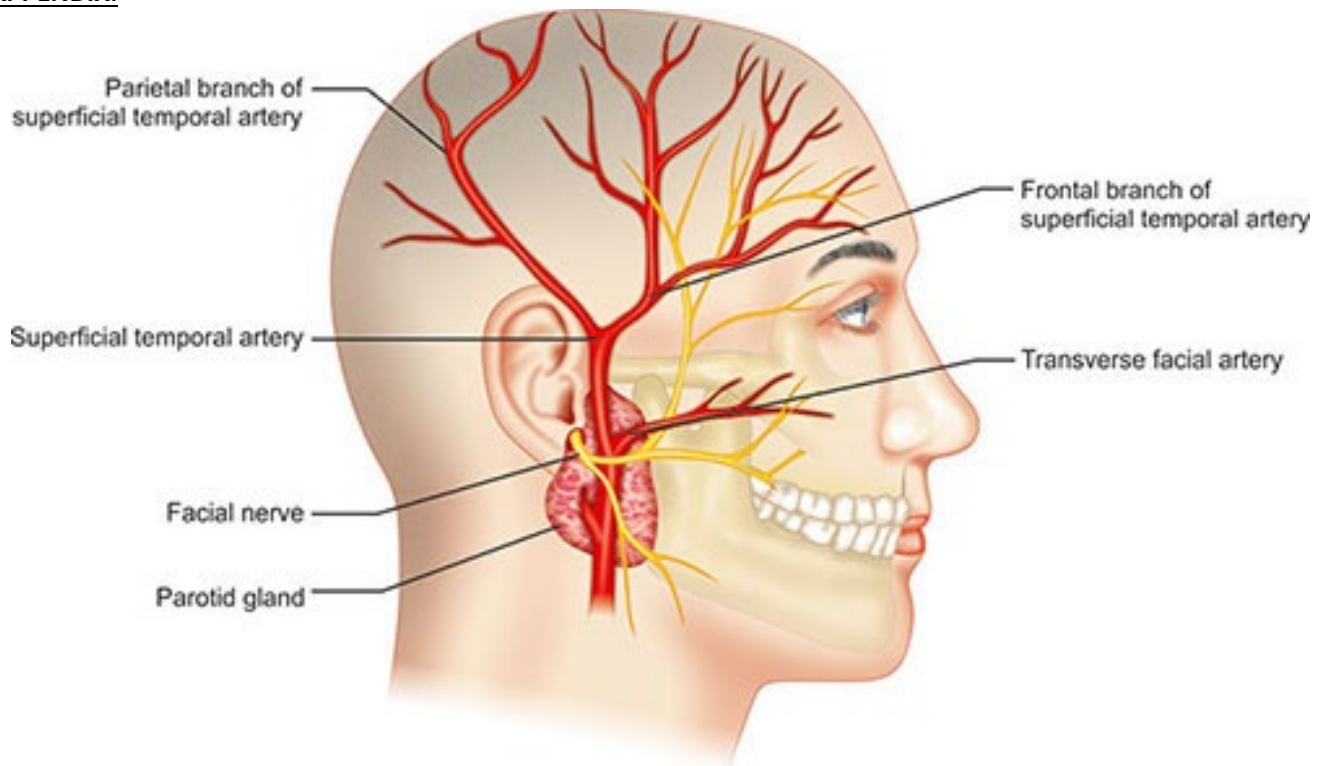
PROCESSING:

- Review examination images and data
- Confirm data in IMorgon (if applicable)
- Document relevant history and any study limitations.

REFERENCES:

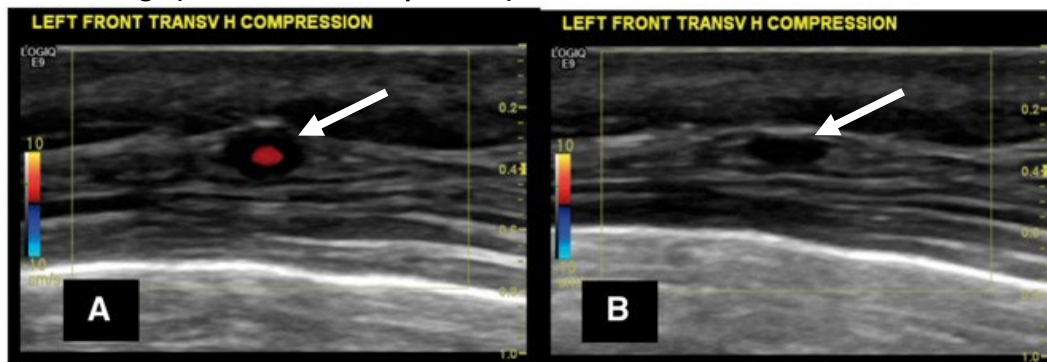
- Ultrasound in the diagnosis and management of giant cell arteritis. Wolfgang A. Schmidt. Rheumatology, volume 57, Issue supplement. 2./Feb 2018. Pgs ii22-ii31, https://doi.org/10.1093/rheumatology/key_44
- Diagnostic performance of temporal artery ultrasound for the diagnosis of giant cell arteritis: a systematic review and meta-analysis of the literature, Rinagel M. et al. Autoimmunity Reviews 2019, 18(1), 56-61, <https://doi.org/10.1016/j.autrev.2018.07.012>

APPENDIX:



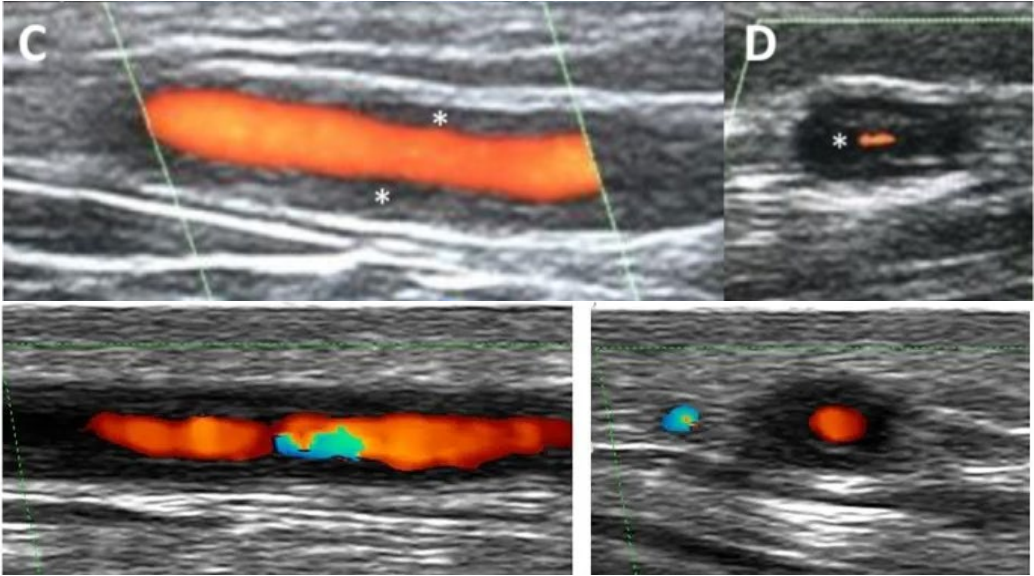
Techniques in Ophthalmic Surgery, Chapter 108-Giant Cell (Temporal) Arteritis

Halo Sign (without/with compression)

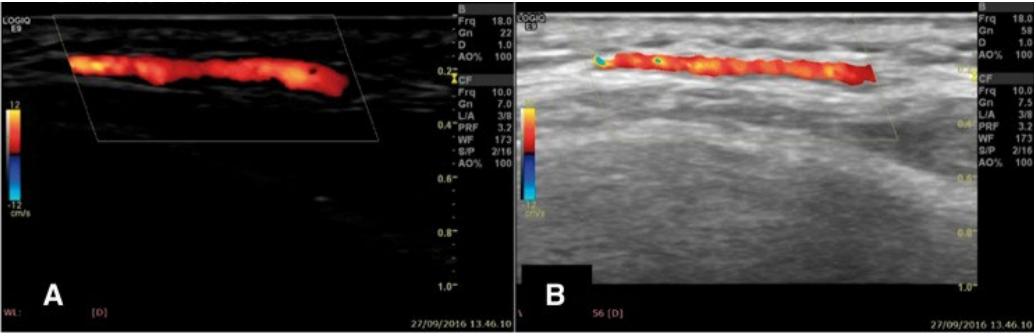


- A halo thickness (from intimal to media) of 0.4 mm is sensitive though not specific. A thickness of 1.0 mm is highly predictive of arteritis.

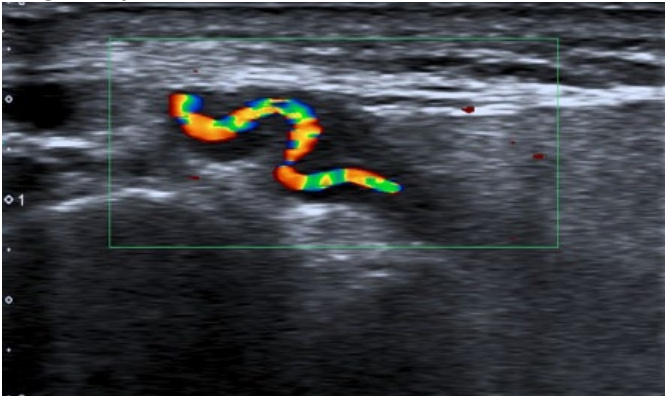
Halo Sign (additional examples)



Luminal Irregularity



Tortuosity, Luminal Irregularity, and Halo



CHANGE HISTORY:

STATUS	NAME & TITLE	DATE	BRIEF SUMMARY
Submission	Allyson LaSalle, RDMS, RVT Monica Morgan, RDMS, RVT	05-27-2020	Submitted
Approval	David Fetzer, MD	05-30-2020	Approved
Review			Reviewed
Revisions	David Fetzer, MD	6-10-2020	Specified need for at least one Duplex spectral waveform for each side
	Skye Smola, RDMS, ,RVT	1-2-2023	Updated protocol image requirements
	David Fetzer, MD	1-26-2023	Updated requirements to include prox CCA and distal temporal artery