Ultrasound – Temporal Artery Doppler

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

SCOPE:
Applies to all ultrasound Doppler of the temporal artery studies performed in:
- UT Southwestern William P. Clements Jr. University Hospital and Clinics, Imaging Services (UTSW Radiology)
- Parkland Health (Hospital and Clinics), Department of Radiology (PHHS Radiology)

ORDERABLE:
- UTSW: US Doppler Temporal Artery
- PHHS: US Doppler Temporal Artery

INDICATIONS:
- Signs or symptoms of temporal arteritis: Headaches, vision loss, jaw pain, fever, fatigue and weakness.
- Abnormal lab values indicating vasculitis (eg. increased CRP, 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 transducer with a frequency range of 2-18 MHz.
- 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.

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
- Recording inflammatory markers such as ESR and CRP is very useful
- 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 hypoechogenicity 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 halo 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 Notes.
- 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.
- Suggested preset: Temporal Artery

DOCUMENTATION:

For Right and Left Temporal Arteries

Anatomy	Grey Scale	Color Doppler	Compression on Still & Cine	Waveform	PSV
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: *label "F" and "P"*	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			
Temporal Artery longitudinal: mid	x	x		x	x
Temporal Artery longitudinal: distal*	x	x			
Frontal Arterylongitudinal: proximal	x	x			
Frontal Artery longitudinal: distal	x	x			
Parietal Artery longitudinal: proximal	x	x			
CCA transverse: mid	x	x			
CCA longitudinal: mid	x	x		x	x
Axillary Artery transverse: mid	x	x			
Axillary Artery longitudinal: mid	x	x			
Stenosis, if found%	x	x		x	x%

***Only needed if Temporal Artery is very long and/or tortuous**

% If stenosis, focal luminal irregularity, or aliasing with color Doppler is identified, spectral Doppler with PSV is needed.

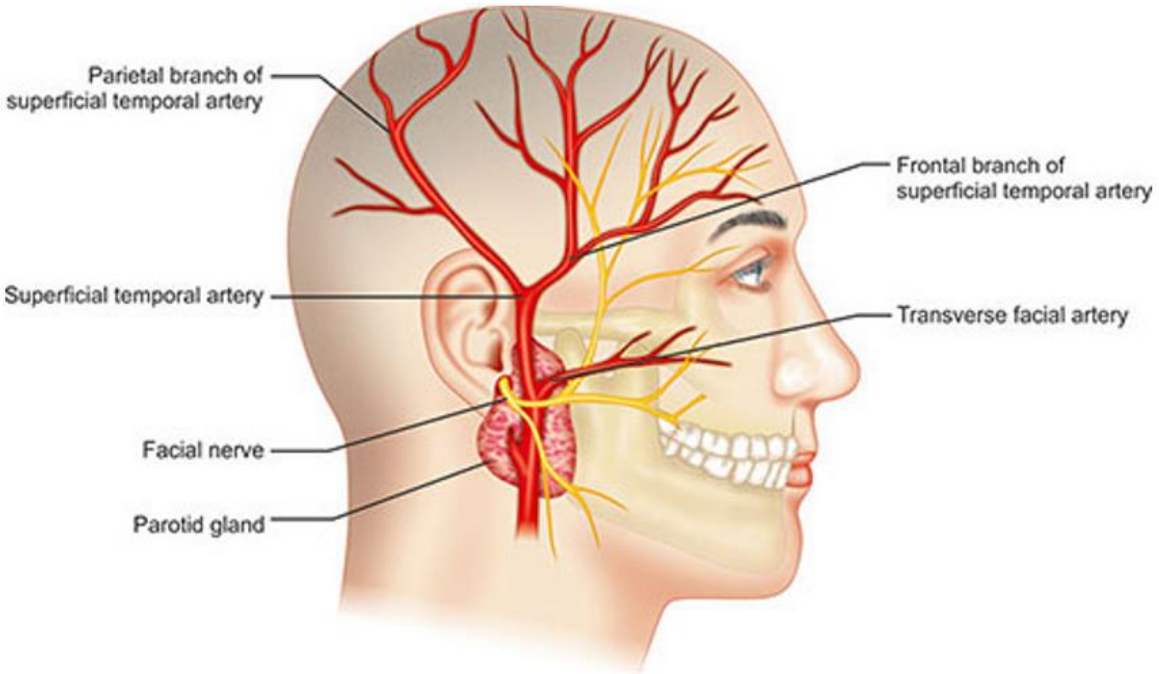
- Data page(s)

PROCESSING:

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

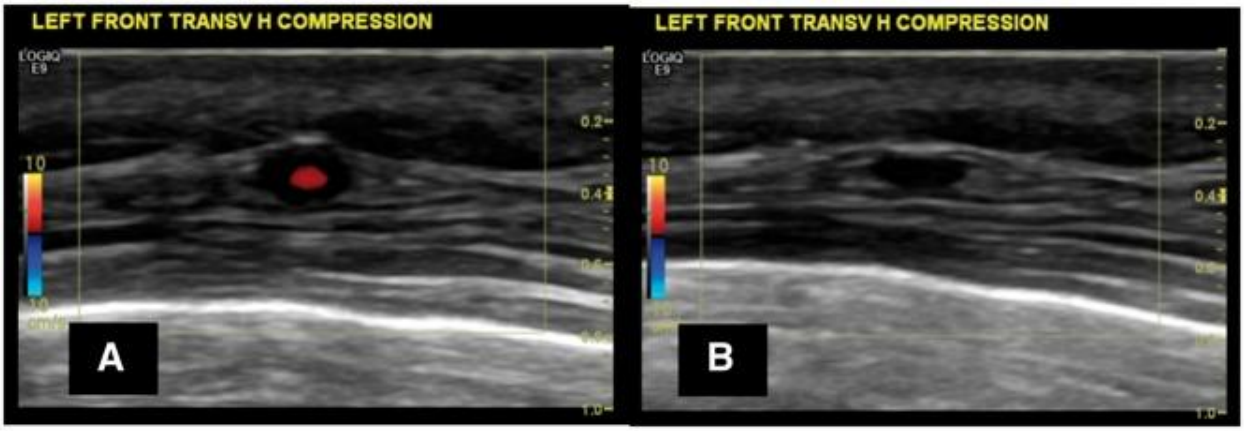
APPENDIX:

Anatomy of the Temporal Artery and It's Branches



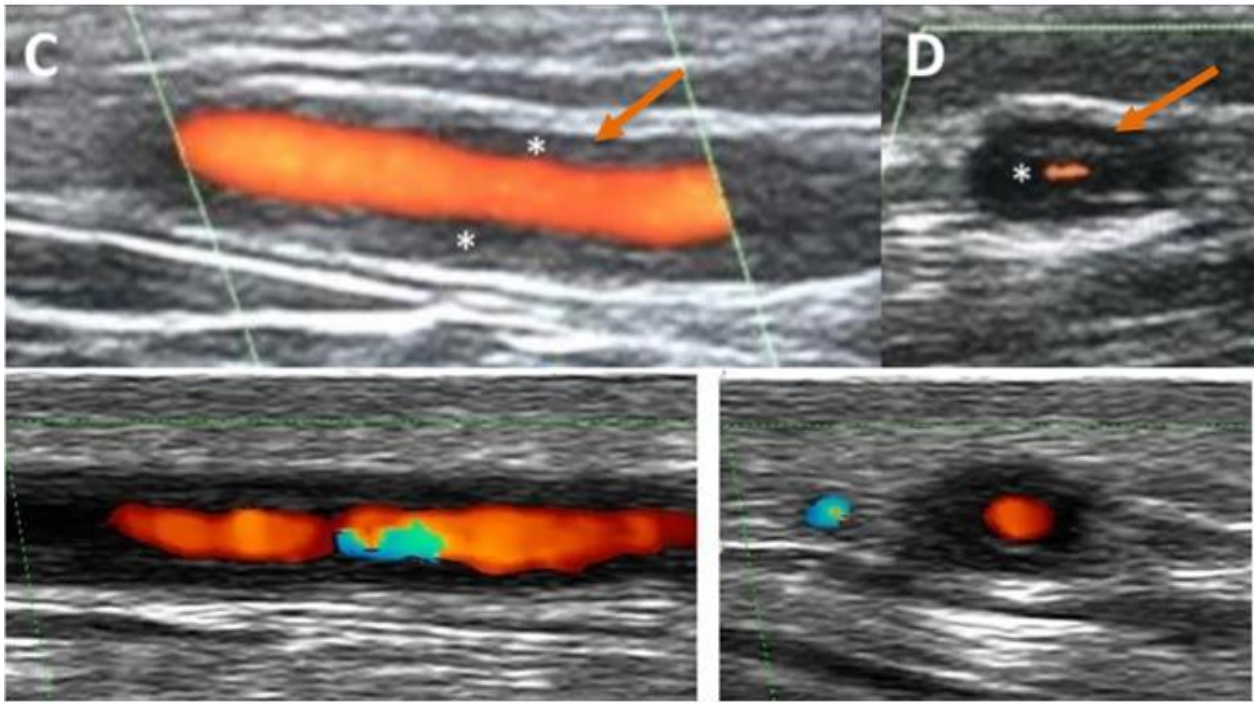
Techniques in Ophthalmic Surgery, Chapter 108-Giant Cell (Temporal) Arteritis

Halo Sign without and with compression



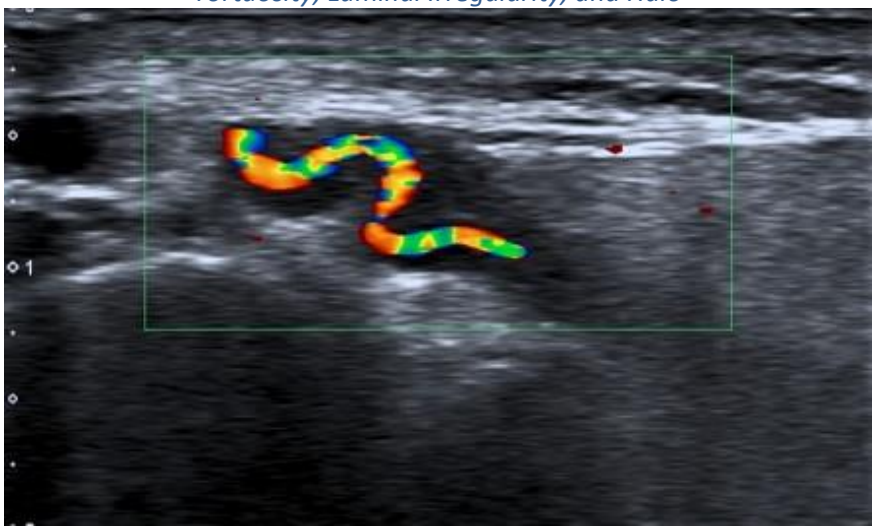
A halo thickness (from intimal to media) of 0.4 mm is sensitive though not specific. A thickness of 1.0 mm is highly predictive of arteritis.

Halo Sign (additional examples)



Luminal Irregularity

Tortuosity, Luminal Irregularity, and Halo



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

CHANGE HISTORY:

DATE:	SUBMITTED BY: (NAME, TITLE)	APPROVED BY: (NAME, TITLE)	SUMMARY:
05/27/2020	Allison LaSalle, RDMS, RVT Monica Morgan, RDMS, RVT	David Fetzer, MD, Director	Submitted & Approved
06/10/2020	David Fetzer, MD, Director	David Fetzer, MD, Director	Specified need for at least one Duplex spectral waveform for each side
01/02/2023	Skye Smola, RDMS, RVT	David Fetzer, MD, Director	Updated protocol image requirements
01/26/2023	David Fetzer, MD, Director	David Fetzer, MD, Director	Updated requirements to include prox CCA and distal temporal artery
05/21/2026	Jana Smith, RDMS, RVT	David Fetzer, MD, Director	Removed waveform and PSV requirements for prox and distal temporal artery, frontal and parietal branches. Applied A11y accessibility features and formatting based on Federal compliance guidelines. Added Parkland logo. Rearranged appendix, references, and change history table.