TEMPORAL ARTERY DOPPLER

Patient Prep:

1. None.

Survey:

Perform a real-time survey of bilateral temporal arteries, bilateral axillary arteries, and bilateral mid common carotid arteries. If the patient needs a complete carotid artery exam also, a dedicated US Carotid exam may be performed on the same day if an order is provided.

Use Doppler or color flow to distinguish vessels and any abnormality.

Image Documentation:

Each image must be labeled with the patient's full name, medical record number, accession number, initials of the imaging technologist, organ/area identification, scanning plane and patient orientation if different from supine.

Transducer:

Linear array transducer with frequency ranges greater than 9MHx. A small footprint (hockey stick) transducer.

General Procedure description:

1. Evaluate the Temporal Artery.
2. Evaluate the Temporal Artery, Frontal Branch.
3. Evaluate the Temporal Artery, Parietal Branch.
4. Evaluate the Common Carotid.
5. Evaluate the Axillary Artery.

Guidelines for Temporal Artery Ultrasound Images:

TEMPORAL ARTERY:

1. Gray scale image longitudinal:
    a. Temporal artery.

2. Color Doppler image longitudinal:
    a. Temporal artery.

3. Spectral Doppler Trace imagine longitudinal:
    a. Temporal artery.

4. Gray scale image transverse:

a. Temporal artery.

5. Color Doppler image transverse:
    a. Temporal artery.

6. Transverse compression images in still and Cine.
    a. Temporal artery.

FRONTAL BRANCH:

1. Gray scale image longitudinal:
    a. Frontal artery.

2. Color Doppler image longitudinal:
    a. Frontal artery.

3. Spectral Doppler Trace image longitudinal.
    a. Frontal artery.

4. Gray scale image transverse:
    a. Frontal artery.

5. Color Doppler image transverse:
    a. Frontal artery.

6. Transverse compression images in still and Cine.
    a. Frontal artery.

PARIETAL BRANCH:

1. Gray scale image longitudinal:
    a. Parietal artery.

2. Color Doppler image longitudinal:
    a. Parietal artery.

3. Spectral Doppler Trace image longitudinal.
    a. Parietal artery.

4. Gray scale image transverse:
    a. Parietal artery.

5. Color Doppler image transverse:
    a. Parietal artery.

6. Transverse compression images in still and Cine.
    a. Parietal artery.

COMMON CAROTID ARTERY:

1. Gray scale image longitudinal:
    a. Common carotid artery (proximal).

2. Color Doppler image longitudinal:
    a. Common carotid artery (proximal).

3. Spectral Doppler velocity measurements with color Doppler in longitudinal:
    a. Common carotid artery (proximal).

4. Gray scale image transverse:
    a. Common carotid artery (proximal).

6. Color Doppler image transverse:
    a. Common carotid artery (proximal).

AXILLARY ARTERY:

1. Gray scale image longitudinal:
    a. Axillary artery (proximal).

2. Color Doppler image longitudinal:
    a. Axillary artery (proximal).

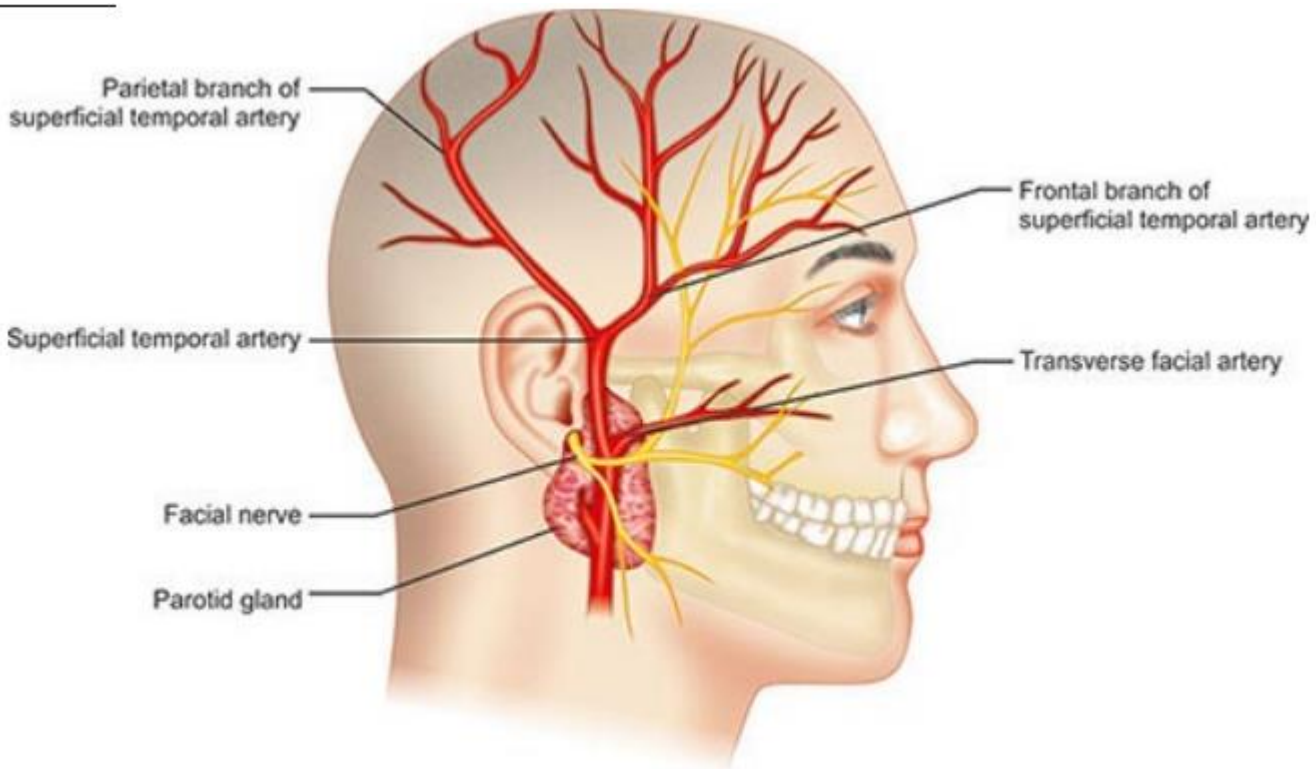
4. Spectral Doppler velocity measurements with color Doppler in longitudinal:
    a. Axillary artery (proximal).

4. Gray scale image transverse:
    a. Axillary artery (proximal).

6. Color Doppler image transverse:
    a. Axillary artery (proximal).

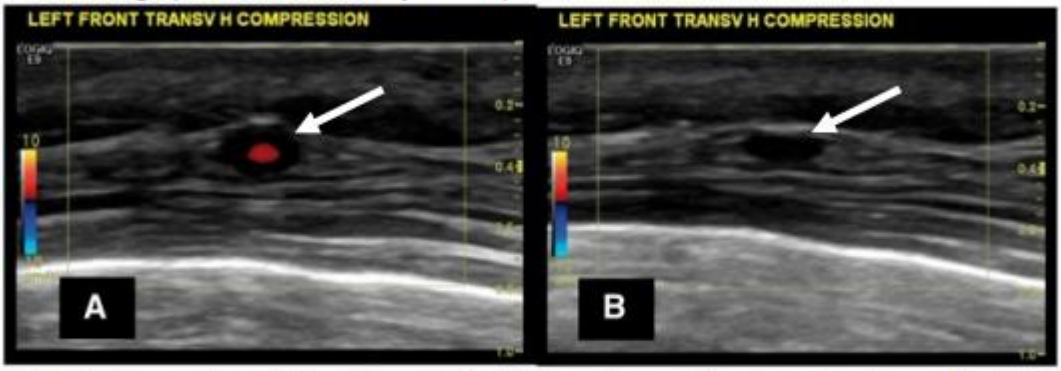
Information:

1. One of the most important signs of the exam is the hypoechoic halo. It is a rim of uniform, ill-defined hypoechogenicity surrounds a long segment of the artery.
2. The hypoechoic halo is best demonstrated with compression.
3. The hypoechoic halo measurement thickness from intimal to medic of 0.4 mm is sensitive though not specific. A hypoechoic halo thickness of 1.0 mm is highly predictive of arteritis.
4. An area of stenosis is another important finding. Stenosis which can be seen as area of luminal narrowing with associated color Doppler aliasing. Occlusion can also be seen. This may be difficult to distinguish from atherosclerosis.
5. Color Doppler should be used to assess for areas of aliasing (turbulent flow).
6. If an area of focal narrowing is noted, image prior to the stenosis and at the stenosis using spectral waveform.
7. Affected vessels may be significantly tortuous. Please note this in the comment section.
8. Hair can cause shadowing during exam.



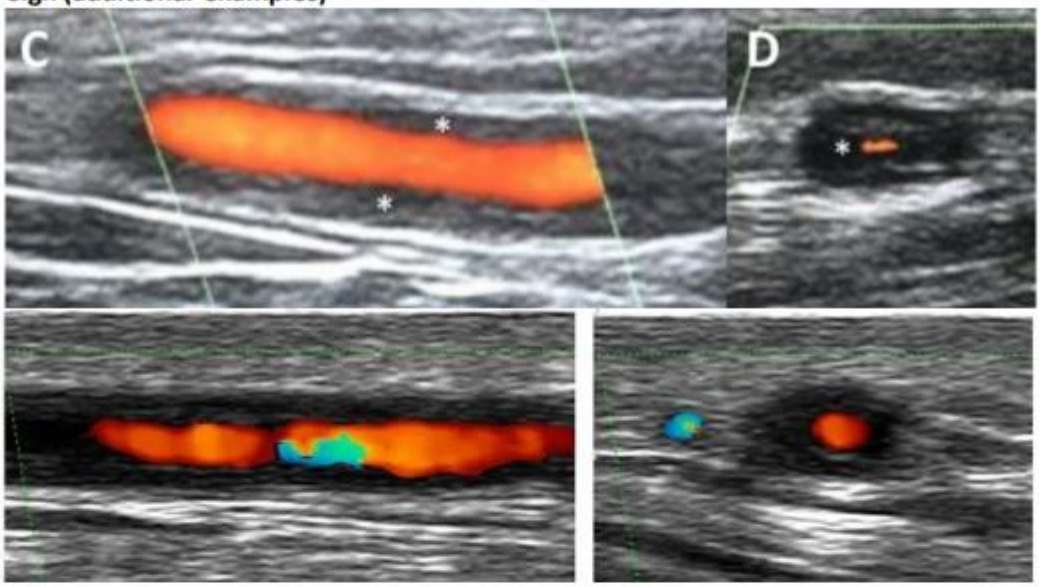
Techniques in Ophthalmic Surgery, Chapter 108-Giant Cell (Temporal) Arteritis

Halo Sign (without/with compression)



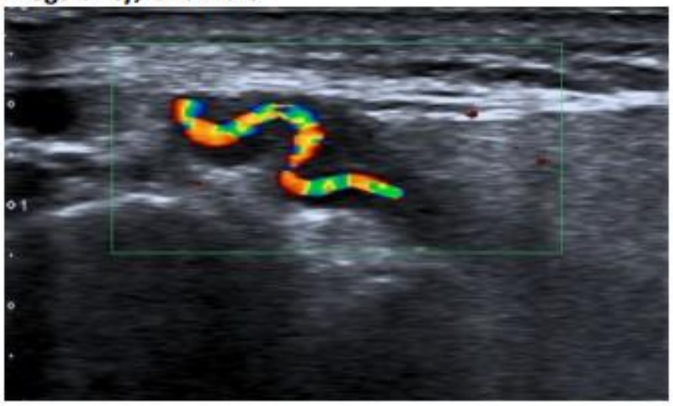
- A halo thickness (from intimal to media) of 0.4 mm is sensitive though not specific. A thickness of 1.0 mm is highly predictive of arteritis.

Halo Sign (additional examples)



Luminal Irregularity

Tortuosity, Luminal Irregularity, and Halo



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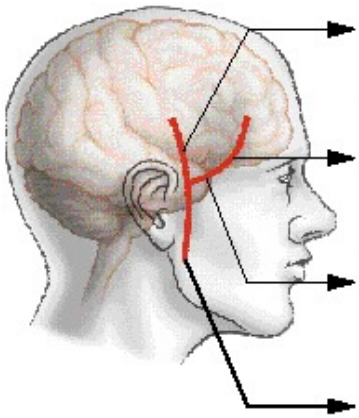
- Diagnostic performance of temporal artery ultrasound for the diagnosis of giant cell arteritis: a systematic review and meta-analysis of the literature, Rinagel M. et al. Autoimmunity Reviews 2019, 18(1), 56-61, https://doi.org/10.1016/j.autrev.2018.07.012



Site	Patients with Temporal Arteritis (N=30)	Patients with Polymyalgia Rheumatica (N=37)	Control Subjects (N=30)	Patients with Negative Histologic Findings and Other Diagnoses (N=15)
Parietal ramus (15 mm distal to bifurcation)				
Systolic lumen (mm)	0.79±0.29	0.76±0.20	0.89±0.24	0.81±0.30
Wall (mm)	0.94±0.28*	0.70±0.08	0.72±0.13	0.79±0.11
Maximal velocity (cm/sec)	52±18	59±14	54±14	57±18
Frontal ramus (25 mm distal to bifurcation)				
Systolic lumen (mm)	0.67±0.20	0.66±0.22	0.74±0.24	0.68±0.23
Wall (mm)	0.95±0.20*	0.66±0.07	0.65±0.13	0.72±0.09
Maximal velocity (cm/sec)	48±13	53±16	47±15	55±19
Frontal ramus (10 mm distal to bifurcation)				
Systolic lumen (mm)	0.74±0.24	0.71±0.17	0.86±0.26	0.78±0.30
Wall (mm)	0.95±0.22*	0.69±0.09	0.71±0.13	0.76±0.10
Maximal velocity (cm/sec)	50±14	56±15	48±13	59±20
Common superficial temporal artery (8 mm below skin surface)				
Systolic lumen (mm)	1.51±0.44	1.54±0.41	1.70±0.35	1.85±0.54
Maximal velocity (cm/sec)	62±22	61±16	55±13	64±16

2023