Abstract:

Color doppler ultrasonography (CDUS) showing a hypoechoic halo is an effective method to assess for the systemic obliterative vasculitis giant cell arteritis (GCA). CDUS is utilized to diagnose our 64 y/o patient with GCA.

I. Case History:

-- **Demographics:** 64 y/o Caucasian male
-- **Chief Complaint:** Migratory joint pain for about two to three weeks and diagnosed with migratory polyarthritis of presumed viral origin. Some mild ocular pain was noticed at that time but vision had worsened over the past couple days accompanied by symptoms of jaw-claudication, frontal headaches, mild pain on EOMs.
-- **Ocular/Medical history:** Patient was seen at the onset of the mild ocular pain and was diagnosed with subclinical anterior uveitis on which he was started on pred forte q4h and which he took “on and off.” Medical history is also significant for hypertension and arthritis.
-- **Medications:** acetaminophen, aspirin, heparin, lisinopril, naproxen

II. Pertinent findings:

-- **Clinical:** Reduced BCVA OS to 20/200 eccentrically with diffusely depressed CVF. EOMs full but with tenderness on movement OU. DFE showed bilateral disc edema OS>OD with normal MVP and clear vitreous
-- **Laboratory studies:** CRP = 74.3, ESR = 50, overall normal CBC, BMP
-- **Others:** Color doppler ultrasound showing a hypoechoic “halo-sign”

III. Differential diagnosis:

-- **Primary/leading:** temporal arteritis (GCA) / arteritic ischemic optic neuropathy
-- **Others:** non-arteritic ischemic optic neuropathy, inflammatory optic neuritis, central retinal vein occlusion, central retinal artery occlusion

IV. Diagnosis and discussion:

-- **Diagnosis:** bilateral anterior ischemic optic neuropathy due to giant cell arteritis
-- **Discussion:**

  The gold-standard for diagnosis of giant cell arteritis has long been a temporal artery biopsy which has a specificity and sensitivity of approximately 95% and 10-61% respectively.\(^4\) Temporal artery biopsy often has a poor sensitivity value due to the inherent nature of the disease which presents as “skip lesions,” thus the section of artery biopsied may be normal whereas another section may be abnormal.

  Abnormal biopsies are definitive for the presence of temporal arteritis, but perhaps a less invasive method should be considered first, especially in patients who are low risk or present with overt signs/symptoms of GCA.\(^1\) One such method is color doppler ultrasonography
(CDUS) of the temporal artery using a high-frequency (13Hz-5Hz) B-mode multilinear transducer with a high frequency Doppler of 9Hz. Abnormalities of the artery scanned will be hypoechoic creating a “halo-sign” that can last anywhere from 2 days to 6 months after initiation of corticosteroid treatment. The “halo-sign” also reappears in cases where patients experience a flare allowing CDUS to not only play a role in diagnosing GCA, but also monitoring the disease recurrence. A recent study of CDUS and GCA by Diamantopoulos et al yielded a specificity and sensitivity of about 90% and 96% respectively, which places ultrasound in the realm of similar specificity to temporal artery biopsy but with a higher sensitivity. CDUS is a) non-invasive, b) allows for a much longer section of the artery to be scanned than the amount traditionally biopsied, c) it can be obtained without the patient stopping their anti-coagulation medications, and d) it is faster than a biopsy. The main limitation is dependent on the experience of the ultrasonographer, however that can be remedied with appropriate training.

V. Treatment/management:

-- Color doppler ultrasonography was performed and a hypoechoic halo-sign was present confirming GCA diagnosis
-- IV solumedrol 250mg q6h x 3 days was initiated followed by 1mg/kg per day of PO prednisone; 70 mg PO prednisone was continued for 2 weeks, then tapered
-- as of abstract submission, patient is currently at 30 mg PO prednisone taper
-- vision has improved to 20/60 from 20/200 and remains stable since initial presentation
-- patient will continue to be monitored with disc photos for comparison as well as possible ultrasound monitoring for resolution of halo-sign and if any flare-ups occur

-- Bibliography/References:


VI. Conclusion:

Ultrasound is an excellent ancillary test that is non-invasive and provides high specificity and sensitivity for diagnosis of GCA when the halo-sign is present. The American College of Rheumatology has also previously issued a classification system with five specific criteria to predict the presence of temporal arteritis. The presence of 3 of 5 criteria yielded a sensitivity of 93.5% and specificity of 91.2%. Therefore, providers should highly consider using the ACR classification system, along with an ultrasound for diagnosis of GCA without necessarily subjecting a patient to temporal artery biopsy. An abnormal biopsy is still the gold-standard, but perhaps it should be reserved for cases where ultrasound is negative or if a definitive diagnosis is not provided by CDUS and ACR classification. All in all, providers should consider ultrasound as one of the initial resources for facilitating temporal arteritis diagnosis rather than immediately opting for an invasive biopsy.