Bilateral Choroidal folds: An unusual presentation

Abstract:
Initial presentation of bilateral choroidal folds is a rare occurrence and requires cautionary approach. This report will review the path in treatment and management of a case with an unusual presentation of bilateral choroidal folds.

Case
Age: 86 years old.
Race: White
Gender: Male
Chief complaint: 85 year old white male presented to the Optometry clinic of Northport Veteran’s medical center with diagnosis of glaucoma. Patient is followed by outside ophthalmologist, but would like to get medication from the VA.

Ocular History:
1) Primary Open Angle Glaucoma- Unknown initial diagnosis. Taking Latanoprost QHS OU.
2) Pseudophakia OU (CE 2007/2008)
3) Non-proliferative diabetic retinopathy
4) Denies prior inflammatory response, trauma, other ocular surgeries besides cataract surgery.
5) Medical records by outside Ophthalmologist reports no prior history of choroidal folds

Medical History
1) Diabetes Type II
2) Hypertension
3) History of Prostate cancer
4) (-) HA

Medications
- Amlodipine Besylate 10Mg Daily
- Insulin Aspart 100unit/ML. 5 Units before breakfast, 5 units before lunch and 7 units before dinner subcutaneously
- Insulin Glargine Inject 47 units subcutaneously every day
- Isosorbide Mononitrate 30MG daily
- Lisinopril 40 MG . Half tablet twice a day
- Aspirin 81 MG Daily
- Atrovastatin calcium 20 MG at bedtime
- Fish oil cap, Oral 1200 MG daily
- Hydrochlorothiazide 25MG Tab daily
- Latanoprost 0.005% soln, Oph both eyes in the evening
- Multivitamin Cap/Tab 1 tablet orally daily
- Ocuvite 1 tab/cap orally daily

Allergies
Zocor and Crestor

**Clinical findings**

**VAS sc**
- OD: 20/30-
- OS: 20/30-

Motilities: Full and smooth

Confrontation visual fields
- Full OD, OS

Pupils: PERRL (-) APD

Amsler Grid
- Negative OD, OS

Subjective refraction
- OD: +0.50-1.50x90 VA 20/20-2
- OS: +0.50-0.50x80 VA 20/25+1
- ADD: +2.50 20/20

Color vision Ishihara 12/12 OD, OS

Slit lamp
Lids/Lashes: Ptosis OD- Longstanding as per patient

Conjunctiva: white and quiet OU

Cornea: Clear OU

AC: Deep and quiet OU

Iris: flat and intact OU

IOP 17/18 mmHg

Von Herrick Angles : 4x4 OU

Dilated Fundus exam
OD:
- Optic Nerve: 1+ pallor vs Pseudopallor. C/Ds 0.5Round.
- Macula: clear
- Periphery: Few Dot homes inferior arcades. Choroidal folds temporal and superior temporal to macula extending to mid periphery.

OS:
- Optic Nerve: C/Ds 0.3 Round
- Macula: Large Dot heme, few MAs (+) CSME
- Periphery: Scattered dot hemes post pole. Choroidal folds temporal and superior temporal to macula extending to mid periphery

Lens: PCIOL OU
Imaging:
- Macular OCT: Choroidal folds OU. CSME nasal to foveal OS
- HVF 24-2
  - OD: Possible inferior arcuate defect.
  - OS: full
- Fundus photos
  - Choroidal folds OS>OD
- Fluorescein angiography
  - Hyperfluorescence OU in line with choroidal folds. OS: enlarged FAZ, 1 Intraretinal hemorrhage nasal to foveal, 1 dot blot hemorrhage in nasal periphery, late leakage nasal to fovea
  - Alternating troughs of hyperfluorescence and hypofluorescence

Radiology MRI
Slightly limited by artifact on the right. No midline shift or mass effect. No evidence of chiasmatic compression. No focus of restricted diffusion in the brain or evidence of acute infarct. A prominent cisteran magna/retrocerebellar arachnoid cyst seen. Optic globes, nerves, extrocular muslces appear symmetric.

Differentials:
Primary/leading diagnosis: Idiopathic
Secondary diagnoses
- Orbital or brain tumor
  - Meningioma
  - hemangioma
- Prior inflammatory disease
- Increased intracranial pressure

Discussion and Diagnosis

1. Orbital tumor compression on the globe can cause choroidal folds. The pattern of the folds can help determine where the tumor is located whether it’s within the muscle cone or exterior to the muscle cone. Within the cone tumors produce folds radiating from the disc and tumors exterior to the cone produce concentric folds with the convex side towards the optic nerve disc. Folds are usually perpendicular to the direction of the compressive force. Orbital tumors ruled out due to lack of evidence from MRI scans. [1]

2. In a study with patients with Vogt-Koyanagi-Harada Disease 12/23 patients were found to have bilateral choroidal folds with Fluorescein angiography. Patients with choroidal folds had poor visual acuity at first visit and had received more immunomodulary treatment. Choroidal folds occurred due to choroidal thickening. The Optic nerve acts as an anchor point and folds radiate from there. Choroidal folds were found more in the acute phase than in the chronic phase and have disappeared in some cases when reaching the chronic phase. Inflammatory conditions may have similar mechanisms of action to cause folds. In this case no prior history of autoimmune or
inflammatory conditions were noted and no reduction in visual acuity relating to inflammatory conditions noted, ruling out this as a possible diagnosis. [6]

3. In 165 eyes recruited from the IIH Treatment trial retinal and choroidal folds were studied using Fundus Photography and spectral domain optical coherence tomography (OCT). 3 different folds were found: peripapillary wrinkles, retinal folds, and choroidal folds. 1% of patients were found to have choroidal folds on fundus photography and 10% of patients found to have choroidal folds on OCT. Choroidal folds were associated with higher levels of intracranial pressure. Cause seems to be tensile and compressive stress placed on the retina caused the intracranial hypertension. Pattern appears dependent on degree of papilledema and anterior deformation of the sclera. In this case no history, signs or symptoms of increased intracranial pressure were reported by the patient. [5]

4. Ocular surgeries which pierce the globe can cause choroidal folds. Full thickness folds commonly occur in 80% of patients immediately after cataract extraction. Usually folds are circumferential folds lying anterior to the equator or radial folds extending in from the ora serrata or more anterior to the region of the equator. The cause may be from hypotony and folds are gone after 24 hours when normal aqueous returns. The patient’s cataract surgery occurred in 2007 and 2008. Choroidal folds should have disappeared even if hypotony occurred at the time. [1]

Management/treatment
- Patient should have full battery of testing, including Fluorescein angiography, Optical coherence tomography, fundus photos, visual acuity, tonometry, CT, MRI [1]
  - Fluorescein angiography used to rule out choroidal neovascularization and differentiate between retinal and choroidal folds
  - OCT also helpful in differentiating between chorioretinal and choroidal folds [4]
    - OCT has been shown to be more accurate in detecting choroidal folds than fundus photography. [5]
- Patient should be observed at regular intervals even if no pathological cause can be found at the time
  - Regular intervals to monitor for changes and make the necessary referrals should a disease process be found

Conclusion/Clinical takeaways
- Most likely diagnosis of this case is idiopathic because other pathological causes are ruled out
  - Though possibility of other causes because full medical history is missing due to lack or complete history of records from outside provider
  - Pt elected to transfer care outside of VA at this point and no official diagnosis was made
- It is important to have a full history of the patient’s medical and ocular history
- Full battery of testing is needed in order to properly diagnose patient with this presentation because conditions that cause this can be vision threatening or even life threatening
- Idiopathic Chorioidal folds is a diagnosis of exclusion [1]
Bibliography