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**Title:** Isolated Painful Ischemic Pupil-Sparing CN III Palsy with muscle contracture headache comorbidity

**Abstract:** Ischemic CN III palsy is the ocular motor nerve palsy most commonly associated with pain. This patient presents with contraction of orbicularis for diplopia relief that created a pain comorbidity.

**I. Case History**
- 59 YO AAM
- **Chief complaint:**
  - Sent by ED to optometry department, then later followed by neurology
  - Eye pain and photophobia followed two days later by diplopia (relief with closing eye), and four days later with 10/10 “stabbing” head pain radiating from right eye over the top of his head toward his back
    - Pain is so severe that patient has difficulty sleeping, even with maximum dose Motrin (600 MG TID PO)
  - Initial neurology evaluation documented a contralateral MR palsy which was which was not noted by optometry nor neurology on follow-up examination
- **Ocular history:**
  - Moderate NPDR OD, OS  
    - h/o diabetic retinopathy s/p laser tx OS by outside MD
  - h/o moderate NPDR +CSME OD, s/p focal laser at Jesse Brown VAMC
  - Early NS OD, OS
  - Refractive error with presbyopia OD, OS
  - Blepharitis OD, OS
  - mild DES 2/2 MGD OD, OS
- **Medical history:**
  - IDDM dx 1997; LBG 204 07/05/2015, LA1C 8.2% 06/2015
  - HTN dx 1976 on meds since 1997, last BP 170/83 06/2015
  - Hyperlipidemia
  - Neuropathy
  - Obesity
  - Vitamin D deficiency
  - Lower back pain
  - Onychomycosis
  - Right elbow pain
- **Medications**
  - Amlodipine Besylate
  - Atorvastatin calcium
  - Potassium chloride
  - Carvedilol
  - Chlorothalidone
  - Clopidogrel
- Insulin
- Metformin HCL
- Lancet
- Losartan
- Magnesium oxide
- Menthol/m-salicylate
- Gabapentin – for ischemic pain

Other salient information
- Upon initial examination by neurology, pt was found to have a contralateral MR palsy not seen on subsequent examination by optometry or neurology

II. Pertinent findings

Clinical
- Pupils: + Direct and consensual without APD
  - OD
  - OS
  - Bright: 1.5 1.5
  - Dim: 2.5 2.5
- EOMs: restricted nasal movement OD, FROM OS
- CVF: Full to Finger Counting, OD, OS
- COVER TEST: CC at distance
  - Horizontal: 18 PD BI
  - Vertical: 8 PD BU OS
- MRD 1
  - OD: 1mm
  - OS: 2mm
- MRD 2
  - OD: 5.5mm
  - OS: 5.5mm
- Cranial nerve testing: I, II, IV, V, VI-XII intact
- Fundus evaluation:
  - CUP/DISC RATIO:
    - OD: 0.60/0.60
    - OS: 0.65/0.65
  - MACULA: (-) CSME OU
    - OD: large laser scar temp to macula, D/B hemes and CWS perifoveally
    - OS: focal scarring, scattered MAs, D/B hemes and CWS perifoveally
  - VITREOUS: NL OU
  - VESSELS:
    - OD: scattered ma's in arcades and D/B hemes
    - OS: scattered ma's in arcades

Physical

ORDERED BY NEURO:
- Lumbar puncture (WNL)

Laboratory studies (all WNL)

ORDERED BY PCP:
- A1C: 8.2

ORDERED BY OPTOMETRY:
• ESR
  **ORDERED BY NEURO:**
  • T4
  • TSH
  • ANA
  • ANCA
  • RPR
  • anti-TPO
  • anti-microsomal ab

• Radiology studies
  **ORDERED BY ER ON INITIAL PRESENTATION:**
  • MRI/MRA performed 07/05/15 showed no intracranial aneurysm, vascular malformations, or masses
  **ORDERED BY NEURO:**
  • Cat Scan of head and neck NL (to look for small aneurysm that is not visualized on MRA)
  • CXR NL
  • Others: none

III. Differential diagnosis
• Optometry diagnosis
  • Pupil-sparing CN III palsy – ischemic
• **DDx by Neuro:**
  • “Pupil-sparing CN III palsy – ischemic”
  • “Inflammatory process such as sarcoidosis”
  • “Connective tissue diseases such as inflammatory ophthalmopathy”
  • “Thyroid ophthalmopathy”

IV. Diagnosis and discussion
Diagnoses:
1. Painful pupil-sparing isolated complete right CN3 palsy, likely ischemic—diagnosed 07/06/15
2. Right HA/periocular ischemic pain with comorbid component of muscle contraction/tension HA from patient squeezing right eye shut while not wearing patch

Discussion:
• CN III palsy is the ocular motor nerve palsy most commonly associated with pain (Greco et. Al)
• When maximum dose Motrin does not manage pain, Gabapentin is an effective drug to use for pain management
  o Gabapentin is a drug used to control epilepsy that is now a mainstay in pain management
• Historically, painful ocular motor nerve palsies were associated with aneurismal etiology, however current literature suggests that ischemia is the most common etiology for a painful CN III palsy (Lincoff and Cogan; Wilker et. Al)
• While it is crucial to rule out an aneurism as a causal factor, ischemic ocular motor nerve palsies also fall into the differential diagnosis in the category
• In such cases onset of pain has been noted to be preceding or associated with onset of diplopia (Wilker et. Al)
• Multiple headache etiologies may also be present, such was the case with this patient, who developed a muscle contraction HA after initial onset of eye pain
• Binocularity is known to promote healing of CN III palsies, however in this case it was an aggravating factor

V. Treatment, management
• This patient was recommended full time patching and recommended 600 mg motrin TID PO for inflammation by optometry without relief, and then gabapentin by neuro
  o Patient reported pain to gradually improve over the next few weeks
• Patient was educated on the cause of the condition and importance of strict BG control and follow-up with PCP

VI. Conclusion
• When evaluating painful ocular motor nerve palsies, ischemic etiology is an essential differential
• Pain management is essential in such patients
  o Gabapentin is useful if NSAID does not provide sufficient relief
• In patients with headache, it is essential to consider multiple etiologies and headache types, in addition to ischemic pain

Bibliography