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Case Report: Pupil Sparing Cranial Nerve Three Palsy

Abstract:
Pupil sparing cranial nerve 3 palsies are most commonly vascular in origin and patients may present with sudden onset diplopia or ptosis. Appropriate and prompt referral is necessary to rule out an aneurysm or mass.

I. Case History
   a. 62 year old Caucasian male
   b. Emergency consult at 9:00pm. Pt states he had constant double vision starting at 12:30pm. Pt’s daughter noticed his left eye was not looking straight ahead. Pt denies pain, headache.
   c. Ocular Hx: Moderate Non-Proliferative Diabetic Retinopathy OU
   d. Medical Hx:
      (+) NIDDM
      (+) Hyperlipidemia
      (+) CAD
      (+) HTN
      (+) Osteoarthritis
      (+) Anemia
   e. Medications:
      - Acarbose, Allopurinol, ASA, Atenolol, Gabapentin, Gemfibrozil, Glyburide, Loratadine, Losartan, Isosorbide mononitrate, Metformin, Methocarbamol, Oxycodone, Simvastatin

II. Pertinent Findings
   a. Initial Visit: 8/16/10
      i. Pupils: PERRL, No APD OD, OS
      ii. Confrontation Fields: FTFC OD, OS
      iii. EOM’s: OS restricted-unable to adduct OS past midline
      iv. Covert Test sc at distance: approx 15ΔLXT
      vi. CT scan without contrast: Negative for acute hemorrhage, infarct
   b. Follow-Up: 8/27/10
      i. Patient reports slurred speech for 3-4 days and stumbling to the right; denies numbness, tingling
      ii. Pupils: PERRL, No APD OD, OS
      iii. Confrontation Fields: FTFC OD, OS
      iv. EOM’s: OS restricted-unable to adduct OS past midline; 2+ left ptosis
      v. Cover Test sc at distance: 14ΔLXT, 7ΔRHyperT
      vi. CT scan without contrast: Small infarct in the midbrain, (-)acute hemorrhage
      vii. Carotid Ultrasound: <50% stenosis of right and left internal carotid artery
      viii. MRI performed: No report available

III. Differential Diagnosis
   a. Partial Left CN 3 Palsy
      i. Etiology: Diabetes vs Stroke vs Aneurysm
IV. Diagnosis and Discussion

a. Diagnosis:

After initial visit: Pupil sparing cranial nerve 3 palsy due to Diabetes Mellitus

Cranial nerve three provides innervation to the Inferior Rectus, Medial Rectus, Superior Rectus, Inferior Oblique, and levator muscle. CN 3 also provides parasympathetic action on the iris sphincter causing pupil constriction. A CN 3 palsy can result from an insult anywhere along its course from the midbrain to the orbit. Clinical signs of a CN 3 palsy may include the affected eye being “down and out”, loss of adduction, limited elevation, limited depression, and dilated pupil. Common symptoms include diplopia (if no profound ptosis) and ptosis. The most common causes of CN3 palsy in adults include aneurysm and ischemia. The presumed etiology of pupil involving cranial nerve 3 palsy is aneurysm at the location of the posterior communicating artery and pupil sparing is presumed to be ischemic in nature (DM, HTN) until proven otherwise. However, there are reported cases in the literature of patients with pupil sparing cranial nerve 3 palsy due to an aneurysm; signifying the importance of imaging studies.

b. Unique to this case is the progression of the cranial nerve palsy from the initial visit to the one week follow up. Also, the initial CT scan 8 hours after the onset of symptoms was negative for acute hemorrhage or infarct. However, the CT scan one week later was significant for a small infarct in the midbrain.

V. Treatment, management

a. Visit 8/16/10

Patient was instructed to patch left eye but to remove patch daily to monitor degree of eye turn and appearance of pupil. Discussed the typical course of recovery is six to eight weeks and presumed diabetic etiology. Patient educated that his left eyelid may start to droop and double vision may worsen before it improves. Patient told to return to clinic ASAP if notices enlarged pupil or if has TIA symptoms or sudden onset headache or pain. Patient was informed of 24 hour on call procedure and schedule for a one week follow up.

b. Visit 8/27/10

Patient was instructed to continue patching his left eye to prevent diplopia and was referred immediately to the emergency room for further testing due to his symptoms of slurred speech and stumbling to the right. A second CT scan was ordered and showed a small infarct in the midbrain that was not noted one week prior. Carotid ultrasound showed less than 50% stenosis of the right and left internal carotid artery. An MRI was also performed but the report was not available. He was admitted on 8/27/10. Patient was scheduled for a two month follow up in the eye clinic.

VI. Conclusion

a. Physicians agreed only 77% of the time on whether a cerebral infarct was present on CT scan for early acute stroke patients. In the case of acute ischemic stroke, the infarct may not be present on the initial CT scan if performed immediately after onset of symptoms. This case illustrates the importance of careful patient education and also to not rule out stroke based on an initial CT scan. Research has shown MRI identifies 90% of all infarcts at 24 hours whereas CT scan demonstrated on 60%. However due to availability and cost of an MRI; CT is still used more often for initial imaging.
b. Bibliography


