A Tragic Case of Perioperative Vision Loss

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No conflicts of interest.

Abstract: A 56 year-old white male presents with severe chest pain, undergoes emergency cardiac bypass surgery, and five days later wakes from sleep with no light perception vision. Family ocular history compounds the situation.

Case History:
- 56 year-old white male (patient E.D.) was transferred from the Providence VA to the inpatient West Roxbury VA Hospital with a chief complaint of severe chest pain while at rest two days prior accompanied by shortness of breath, diaphoresis, and dizziness.
- Current medications: Aspirin 325mg, Atenolol 50mg, Atorvastatin 10mg, Bupropion 100mg BID, Cilostazol 100mg, Lisiniopril 10mg, Mirtazapine 15mg, Naltrexone 50mg.
- At West Roxbury VA, coronary angiography showed three vessel coronary artery disease (CAD) including a critical 95% lesion in the mid-distal left main.
- E.D. underwent emergency coronary artery bypass grafting (CABG) x 3 that afternoon for unstable angina.
- At no time during the operation did the patient experience excessive blood loss, require blood transfusion, or arrest. Most recent ocular history was from five years prior with presbyopia and unremarkable dilated ocular health.

Pertinent findings:
- Five days following emergency CABG x 3, the patient woke from sleep at 2am and stated ‘can I get up I can’t see.’
- His nurse documented the pupils to be equal in size and NON-REACTIVE to light.
- Cardiac surgery made rounds at 8am and noted that the patient was ‘having problems seeing, he states that the room is dark and is barely able to see me standing in front of him.’
- Neurology was consulted and examined patient at 10am where the residents documented the vision being worse than 20/500 and that pupils were equal, round, and REACTIVE to light. An inpatient optometry consult was ordered.

Bedside eye examination in Cardiac Care Unit (CCU):
- History: patient was seeing formed visions of unfamiliar people performing various tasks all about the room
- VA sc: OD NLP, OS NLP
- OKN drum: no response horizontal or vertical
- Pupils: anisocoria OD>OS, non-reactive to light OU but reactive to near OU
- Versions: grossly intact by Doll’s head, Hirschberg EXO posture
- CN testing: intact
- Anterior Segment: unremarkable / IOP 12, 11
• Posterior segment:
  Media: view into eye 20/20 OD and OS
  Macula: clear, +foveal reflex, no cilioretinal artery OU
  Vessels: veins dilated OS>OD, mild tortuosity OS, no emboli visible OU
  Optic nerve: negligible cupping, margins indistinct 360, no retinal hemes
  Posterior pole: ‘fingers’ (projections) of flat peripapillary whitening 3:00 and
  9:00 OS > 9:00 OD
  Periphery: OD blot hemorrhage at equator, IT retinoschisis
  OS CWS x 2, temporal retinoschisis

• Radiology: CT head and MRI/MRA of the brain: previously noted large area of
  encephalomalacia in right front lobe, chronic occlusion of right cervical and intracranial
  ICA, but otherwise unremarkable study

• SED 57, CRP 31.4

Differential diagnosis:
• Primary: Bilateral NA-AION in the setting of recent cardiac surgery
• Other:
  Arteritic-AION secondary to GCA although fundus appearance, patient’s age, and lack of
  other symptoms of GCA made diagnosis less likely. Biomarkers (CRP and ESR) are
  unreliable in the time following major surgery, therefore if highly suspicious, temporal
  artery biopsy should be pursued (Alpert, 1987).

Diagnosis:
1) Bilateral NA-AION in the setting of cardiac surgery (POD 5)
2) Peripapillary retinal/choroidal infarcts
3) Formed visual hallucinations: Charles Bonnet and/or delirium
4) Tragedy of case given family history

Discussion will include:
• Incidence of ocular complication following non-ocular surgery
• Definition of and incidence of perioperative vision loss (POVL)
• Most common causes of POVL
• Most at risk surgeries for POVL
• Preoperative, intraoperative, and postoperative risk factors for POVL secondary to AION
• Treatment and management:
  o Our individualized management plan and recommendations to medical staff.
  o Prognosis
  o Guidelines for treatment/management
  o Updates to the case.
Clinical Pearls:

- Challenge of bedside examination in acute hospital setting and importance of bedside manner
- ‘Deception by pupils’: pupils can differentiate between an eye or neurologic problem
- Provide a differential diagnoses for a patient with remote h/o surgery and subsequent vision loss
- Being present, being empathetic, seeking resources
- Interdisciplinary communication

Works Cited


Other resources referenced in final presentation:


Case Data:
A 26-year-old black female, HIV+, presented to the clinic with blurred vision, photophobia and tearing after wearing her friend’s used cosmetic contact lens. She wore the lenses continuously (overnight wear) for two to three days until she first started having pain yesterday.

Pertinent Exam findings
- **VA:**
  - OD: 20/40
  - OS: 20/30
- **Pupils:**
  - ER/L OU
- **Fields:**
  - Full to finger counting OU
- **Lids and Lashes:**
  - Normal OU
- **IOP:**
  - OD: 14 mmHg
  - OS: 12 mmHg
- **Conjunctiva:**
  - Mild bilateral injection OU
- **Cornea:**
  - Diffuse Grade 3 Punctate Erosions OD>OS
- **AC:**
  - Deep and quiet OU
Microsporidial Keratitis

Microsporidia are unicellular eukaryotes that were once thought to belong in the protozoan family; however, based on DNA identification, they are more closely related to fungi.

More than 1,500 microsporidia species have been identified, although only a handful affect humans.

Although the mode of transmission to human hosts are not entirely clear, ingestion or inhalation of contaminated soil or water might be the primary source of entry.

Due to its dense electron glycoprotein and chitin layer, the spores are highly resistant to environmental damage.

Some studies have shown microsporidial spores in human urinary tracts, suggesting the possibility of sexual transmission.
Microsporidial Keratitis

- Microsporidia are opportunistic organisms that can affect both immunocompetent and immunocompromised hosts, although more commonly in those who are immunocompromised.
- The life cycle of the organism begins with the injection of sporoplasm via a polar tubule into the host cell. Then the sporoplasm replicates rapidly. Spores then form by sporogony (in free cytoplasm or in a vacuole) to finally mature and release continuing the cycle.

Clinical Presentation

- Multiple, coarse, superficial epithelial punctate erosions in either a peripheral or diffuse pattern
- Central corneal edema with an anterior chamber reaction and fine keratic precipitates
- An infiltrate may develop after the epithelial keratitis
- Symptoms include pain, decreased vision, photosensitivity, tearing and foreign body sensation

Diagnosis

- Because the clinical presentation and symptoms are similar to keratitis, it is sometimes difficult to differentiate microsporidial infection from other etiologies.
- To make a definitive diagnosis, either corneal scraping or staining with gram stain. (The chitin shell dyes bright red with trichrome stain and bright violet with gram staining)

Treatment

- Although there is no standardized treatment, several studies suggest the use of oral albendazole (400mg PO BID for two to four weeks) in conjunction with topical fumagillin (3mg/ml drops—Q1-4hr for 10 days).
  - Albendazole is an anthelmintic that acts on the microtubules of the microsporidia to prevent further proliferation
  - Fumagillin is an antibiotic derived from Aspergillus fumigatus. Its mechanism of action involves inhibiting metalloprotease methionine aminopeptidase type 2 and endothelial formation

Newer studies suggest that using a topical fluoroquinolone as monotherapy may be a viable first-line therapeutic approach.

As mentioned earlier, microsporidia have recently been classified as fungi, but upon genetic sequencing, a partial encoding for topoisomerase IV was identified in some microsporidial species.
Our patient

She was started on Vigamox Q3h and Erythromycin UNG QHS OU. We planned to have her return in 2 days for F/U and corneal scraping if no improvement. Patient did not show up and ultimately was lost to F/U.

Thank You!

- Majed Al Karashi, MBBS
- American Academy of Optometry