The Modern Management of Ocular Occlusive Disease

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Description: This inclusive primer reviews the anatomy and pathophysiology of arterial and venous occlusive disease. The discussion includes critical signs and symptoms of the common ocular occlusive events along with descriptions of treatment options and outcomes-of-intervention.

Objectives:

1. Review of the pertinent anatomy of the ocular vasculature.
2. Review of systemic diseases that may be associated with vascular occlusion and the necessary laboratory work up.
3. Develop an understanding of emboli formation and how they affect the systemic and ocular vasculature.
4. Discussion of the presentation, diagnosis, and management of ocular occlusion.
5. Discussion of arteritic anterior ischemic optic neuropathy along with its diagnosis and management.
6. Presentation of the recent evidence based treatment modalities that influence standard of care of both arterial and venous occlusion.

Coure Outline:

I. Retinal arterial occlusion. (50 minutes total)

- A. Associated anatomy. **(5 minutes)**
- B. Anatomy of an embolis. **(5 minutes)**
  1. Thrombus.
  2. Cholesterol (Hollenhorst plaque).
  3. Calcific.
- C. Central retinal artery occlusion (CRAO) / Branch retinal artery occlusion (BRAO). **(30 minutes)**
  1. On the continuum of ischemic optic neuropathy (ION).
     a. Nonarteritic – embolic.
     b. Arteritic – Giant cell arteritis (GCA).
  2. Ocular management.
     a. Retinal autoregulation.
        1) Carbogen / Increased intake of carbondioxide.
        2) "Mashing the eye"
     b. Decreasing the IOP.
        1) Phamaceuticals.
           a) Timoptic
           b) Iopidine
           c) Diamox
           d) Hyperosmotics
        2) Parecentisis.
  3. Systemic management.
     a. Morbididty and mortality.
        1) Increased mortality from 27% to 56% over 9 yrs.
        2) Decreased life expectancy to 5.5 years from 15.4 yrs.

3) 3% per year increased risk of stroke.

b. Lab testsing.

1) Complete blood count (CBC w diff and platelets).
2) Erythrocyte sedimentation rate (ESR).
3) General inflammatory C – reactive protein (CRP)
4) Prothrombin time (PT) / Activated partial thromboplastin time (aPTT).
5) Lipid Panel.
6) Two – D Echocardiogram / Transesophogeal echocardiogram.
7) Carotid Doppler.
8) BP.

D. Arteritic ION – GCA **(10 minutes)**

1. Anatomy.
2. Lab testing.
   1) ESR.
   2) CRP.
3. Temporal artery biopsy.
   a. Technique.
   b. Pathology.
      1) Internal elastic lamina infiltrated.
      2) Lymphocytes.
      3) Plasma cells.
      4) Multinucleated giant cells.
4. Systemic Management.
   a. IV Methylprednisolone.
   b. Oral steroids.
5. Mortality and Morbidity.
   a. Increased mortality owed to cardiovascular disease.
   b. Aortic aneurysm formation in 15%.
      1) 50% of patients with thoracic aneurysm die of dissection.
   c. Increased risk of stroke and TIA up to 7 %.

II. Retinal venous occlusion. (50 minutes total)

A. Associated anatomy. **(5 minutes)**

B. Anatomical correlates to thrombus formation. **(5 minutes)**

1. The clotting cascade.
2. Non-laminar flow.

C. Nomenclature. **(5 minutes)**

1. Twig vein occlusion (TRVO).
2. Branch or quadrantic vein occlusion (BRVO).
3. Hemi retinal vein occlusion (HRVO).
4. Central retinal vein occlusion (CRVO).
5. Incomplete vein occlusion: Venous stasis retinopathy.
6. Ischemic vs. Non-ischemic.

D. Diagnosis. **(20 minutes)**

1. Symptoms.
   a. Vision.

b. Pain (Actually….painless).

2. Signs.
    a. Variably decreased acuity.
    b. Variably decreased color and brightness.
    c. Variably affected visual field.
    d. Relative afferent pupil defect.
3. Appearance.
4. Vascular sheathing.
5. Collateral vessel filling.
6. Associated systemic disease.
    a. DM.
    b. HTN.
    c. Coagulopathy.
    d. Hyperviscosity.
    e. Cardiac.
    f. Carotid.
    g. Infectious.
    h. Inflammatory.
    i. Autoimmune.
7. Intraretinal and iris neovascularization. (Gonioscopy).

E. Management. **(15 minutes)**

1. Find the underlying cause: Systemic laboratory work up along with systemic management.
    1) Complete blood count (CBC w diff and platelets).
    2) Erythrocyte sedimentation rate (ESR).
    3) General inflammatory C – reactive protein (CRP)
    4) Prothrombin time (PT) / Activated partial thromboplastin time (aPTT).
    5) Lipid Panel.
    6) Two – D Echocardiogram / Transesophogeal echocardiogram.
    7) Carotid Doppler.
    8) BP.2. Anticoagulation.
3. Monitor visual recovery.
    a. Vision.
    b. Pupils.
    c. Fields.
    d. Intraocular pressure (IOP).
4. Monitor ocular recovery.
    a. Iris (Gonioscopy) and retinal neovascularization (Dilated fundoscopy).
    b. Retinal blood reabsorption / retinal edema (Macular edema).
    c. Serial photography.
    d. Flourescein angiography.
5. The National Eye Institute of The National Institute's of Health Guidelines.
    a. The Branch Retinal Vein Occlusion Study (BRVOS).
    (Am J Ophthalmol 1984; 98(3): 271 – 282).
    b. The Central Retinal vein Occlusion Study (CRVOS).
        1) "M" Branch. (Ophthalmology 1995; 102 (10): 1425-1433).
        2) "N" Branch. (Ophthalmology 1995;102 (10): 1434-1444).

    c. The Standard of Care vs. Corticosteroid Treatment for Branch Vein Occlusion (SCORE).
6. Differential diagnosis: One diagnosis doesn't preclude another.
    a. Wet AMD (Any disease with CNV).
    b. Neuroretinitis.
    c. Retinoarteriomacroaneurysm.
    d. Hypertensive retinopathy.
    e. Cytomegalovirus retinopathy.
    f. Diabetic retinopathy.