Management of Central Serous Retinopathy

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Central serous chorioretinopathy (CSC): characterized by detachment of retina and subretinal fluid and precipitates; often bilateral and may be episodic; ophthalmologist may see macular and extramacular atrophy of retinal pigment epithelium (RPE), runoff, or guttering; forme fruste includes changes in RPE and choroidal thickening without subretinal fluid; severe forms multifocal with bullous retinal detachments; acute CSC (may refer to disease < 6 mo or to initial presentation) more likely to resolve spontaneously; patients report blurred vision, micropsia, metamorphopsia, paracentral scotoma, and color changes; visual acuity (VA) often good (average 20/30); rarely, patients report migraines

Pathophysiology: occurs most often in healthy men 25 to 35 yr of age; usually asymptomatic until macula involved; CSC has no ethnic predilection; risk factors include steroid use, type A personality, Cushing syndrome, organ transplantation, lupus erythematosus, Helicobacter pylori, gastroesophageal reflux, sleep apnea, and pregnancy

Imaging: optical coherence tomography (OCT) — may show serous pigment epithelial detachment and thickened choroid; fluorescein angiography (FA) — most common feature expansile dot; smokestack present in 10%; diffuse CSC (more rare) associated with extensive subretinal fluid and broad pattern of leakage; indocyanine green (ICG) — highlights choroidal vasculature, filling delays, venous dilation, and hyperpermeable vessels; multifocal, hyperfluorescent patches may enlarge and subside; ICG may distinguish CSC from occult choroidal neovascularization (CNV), neovascular age-related macular degeneration (AMD), and polypoidal choroidal vasculopathy (PCV); fundus autofluorescence — detects subtle features; may show granular atrophy, descending tracks, macular atrophy, annular configurations (cateray forms), granular hyperautofluorescence, hypofluorescent tracks, attenuated outer nuclear layer, and nummular changes

Differential diagnosis: includes AMD and PCV (blood and lipid characteristic of AMD and PCV), optic nerve pits, uveal effusion syndrome, Vogt-Koyanagi-Harada (VKH) disease, and pachychoroid diseases

Prognosis: 80% to 90% of patients do well; subretinal fluid may resolve spontaneously in 3 to 4 mo; VA recovers more slowly (≈ 1 yr); some patients have permanent loss of vision; half experience recurrences; bullous cases have poorest outcomes

Management: observation reasonable initially; after 3 to 6 mo, common treatments laser, photodynamic therapy (PDT), and systemic medication; patient should be seen in 3 to 4 wk to look for CNV (occurs in 2%, even without laser treatment); laser seals focal areas and may recruit other cells to area and improve pumping function of RPE; micropulse (subthreshold) laser treats RPE broadly and has minimal adverse effects; verteporfin PDT commonly used off-label; potential complications atrophy of RPE, ischemia of choriocapillaris, CNV, and tears in RPE; modifications use lower doses, less time, and less fluid; PDT probably induces short-term hyperperfusion of choriocapillaris and longer-term choroidal remodeling

Pharmacotherapy: vascular endothelial growth factor (VEGF) not increased in aqueous humor of patients with CSC; anti-VEGF agents might decrease permeability; these drugs most useful for patients who develop CNV (off-label use); other treatments mitefpristone, ketocanazole, finasteride, spironolactone, rifampin, modulation of hypothalamic-pituitary axis, carbonic anhydrase inhibitors, and treatment for H pylori

Retrospective studies: largest series of PDT studied 265 eyes; treated patients showed improvements in visual loss and resolution of subretinal fluid; complications RPE atrophy in 4% and severe decrease in VA in 1.5%; in another series, patients treated with half-fluence PDT (n = 75) or observation (n = 117); half-fluence PDT associated with less leaking and better VA

Prospective study: treated 18 patients with low-fluence PDT and 16 with ranibizumab; low-fluence PDT superior to ranibizumab; more patients in PDT group had resolution of subretinal fluid, reduction in retinal thickness, and improved VA

Meta-analyses: in one analysis, PDT favored over anti-VEGF agents and observation; anti-VEGF agents no better than observation; Cochrane analysis reported that no treatment clearly better than observation, but suggested that PDT or micropulse laser might be best treatment

Recommendations: review medication list and address modifiable risk factors; safest treatment probably half-fluence PDT (at site of leakage or to entire area of submacular fluid); treatment may be repeated; anti-VEGF agents probably best reserved for patients with CNV; evidence for systemic drugs not sufficient to justify use

Educational Objectives

The goal of this program is to improve diagnosis and treatment of retinal diseases. After hearing and assimilating this program, the clinician will be better able to:

1. Recognize the signs of central serous chorioretinopathy.
2. Select appropriate imaging modalities for patients with retinopathy.
3. Discuss the role of fluorescein angiography in patients with retinopathy of prematurity.
4. Summarize common viral causes of uveitis.
5. Manage a patient with cystoid macular edema.

Faculty Disclosure

In adherence to ACCME Standards for Commercial Support, Audio Digest requires all faculty and members of the planning committee to disclose relevant financial relationships within the past 12 months that might create any personal conflicts of interest. Any identified conflicts were resolved to ensure that this educational activity promotes quality in health care and not a proprietary business or commercial interest. For this program, the following has been disclosed: Dr. Chan is a consultant for Alcon, Allergan, and Bausch & Lomb, and is on the scientific advisory board for Visunex Medical Systems. Dr. Chau reported nothing to disclose. Dr. Bhat reported nothing to disclose. Dr. Ulanski reported nothing to disclose. The planning committee reported nothing to disclose. In their lectures, Drs. Chau, Chan, and Ulanski present information related to the off-label or investigational use of a therapy, product, or device.
Retinopathy of Prematurity

Robinson Vernon Paul Chan, MD, Professor of Ophthalmology and Visual Sciences, Illinois Eye and Ear Infirmary, University of Illinois at Chicago

Fluorescein angiography: study (Klufas et al, 2015) evaluated effect of FA on assessment of retinopathy of prematurity (ROP); experts first viewed color photographs alone and provided diagnosis and management plan; they then viewed photographs paired with FAs; investigators asked them whether seeing FA changed their responses; after seeing FA, experts changed their responses in ±50% of cases and changed recommended management in 25%; FA often revealed more severe disease

Implications: unclear whether cystoid macular edema (CME) and vitreomacular traction should be treated early; when macular changes visible, ophthalmologist should do ultra-widefield FA to look for peripheral changes

Management: consensus guidelines hold that type 1 or worse ROP should be treated, but type sometimes hard to classify; among 1444 eyes in database, logistical concerns and clinical judgment led to treatment outside guidelines in 9.5% of treated eyes; findings stress need for clinical judgment; for unknown reasons, patients with similar disease at presentation have different clinical courses

Other approaches: smaller instruments that cut efficiently offer lower morbidity; data on enzymatic vitreolysis with ocriplasmin for children equivocal and sparse; bilateral sequential surgery with paired FAs; investigators asked them whether seeing FA changed their responses; after seeing FA, experts changed their responses in ±50% of cases and changed recommended management in 25%; FA often revealed more severe disease

Progressive outer retinal necrosis: necrotizing chorioretinitis associated primarily with advanced AIDS, but also seen with Hodgkin lymphoma and transplantation; most affected patients have generalized herpes zoster; hematogenous dissemination and acyclovir-resistant VZV may be risk factors; presents with minimal inflammation in anterior and posterior segments and retinitis in posterior pole and periphery; usually progresses to loss of vision despite treatment; other complications include atrophic retinal detachment, secondary atrophic and thinned retina, and multiple holes

Cytomegalovirus retinitis: primarily affects neonates and immunocompromised patients with leukemia, lymphoma, or AIDS; most cases caused by reactivation of previous infection; highly active antiretroviral therapy has resulted in 75% reduction in CMV retinitis; typically begins as small, white infiltrate; hemorrhagic type features perivascular, fluffy, white lesions with many scattered hemorrhages; other type has granular appearance with few hemorrhages, central clearing, atrophic retina, and stippling of RPE; treated by improving immune status of patient; may be treated with oral valganciclovir or intravitreal ganciclovir and foscarnet

Treponema pallidum: syphilitic uveitis increasing in developed world; young men disproportionately affected; uveitis most common ocular finding in patients with tertiary syphilis, occurring in 2.5% to 5%; disease of posterior segment more common in patients with HIV; syphilitic uveitis strong predictor of HIV co-infection; small, white, superficial retinal precipitates may migrate over retina; retina inflamed, glassy, and mildly opacified; appearance distinct from that of necrotizing retinitis seen with HSV; involved areas typically heal with minimal disruption of RPE; acute syphilitic posterior placoid choriretinitis often seen in middle-aged men, of whom one-third positive for HIV; outer retina and choroid inflamed; features include
yellowish, ill-defined, placoid, confluent lesions at posterior pole and in periphery, hemorrhages, retinal vasculitis, disc edema, and serous detachment; syphilis diagnosed with treponemal tests (fluorescent treponemal antibody absorption test, *T. pallidum* hemagglutination test, particle agglutination test, or microhemagglutination test); nontreponemal tests (Veneral Disease Research Laboratory and rapid plasma reagin [RPR] tests) may be falsely positive; RPR useful for monitoring response and disease activity; syphilitic uveitis treated as neurosyphilis with intravenous penicillin G or procaine penicillin

**Suggested Reading**


**Management of Cystoid Macular Edema**

**Lawrence J. Ulanski II, MD, Clinical Assistant Professor of Ophthalmology, Illinois Eye and Ear Infirmary, University of Illinois at Chicago**

**Approach**: CME sign, not diagnosis; physician must treat cause of CME, which may be inflammation (eg, Irvine-Gass syndrome [IGS], uveitis), ischemia, diabetes, central or branch vein occlusion or radiation, traction, or epiretinal membrane

**Irvine-Gass syndrome**: macular edema visible on OCT in 14% and on FA in 1% to 2%; OCT sensitive for identifying CME; IGS associated with trauma from cataract surgery, especially after loss of vitreous; other risk factors diabetes, hypertension, chronic renal failure, smoking, poor diet, alcohol, and history of uveitis; uveitis should be strictly controlled for 3 mo before cataract surgery; noninvasive anti-inflammatory control, including oral steroids, recommended; *natural history*—peak incidence of CME at 6 to 10 wk postoperatively; 80% oc cases resolve in 3 to 12 mo, but may consider aggressive measures after 3 mo

**Management**: nonsteroidal anti-inflammatory drugs—indomethacin and ketorolac efficacious in clinical trials; unforeseen therapies nepafenac (Nevanac) and bromfenac (eg, Bromday, BromSite, Prolensa) said to penetrate posterior segment, but no comparative studies done; steroids—topical agents may be used; after 3 mo, subtenon or intravitreal injections may be indicated; mydriasis—used when iris traumatized; vitrectomy—pars plana vitrectomy associated with better visual outcomes in setting of IOL and loss of vitreous

**Diagnosis**: patients with diabetes and IGS may be misdiagnosed with diabetic macular edema (DME), and vice versa; FA should be performed to look for enlargement of foveal avascular zone, peripheral capillary dropout, and ocular ischemic syndrome; branch retinal vein occlusion associated with indirect peripheral ischemia

**Treatment**: depends on cause and response; DME—for patient with traction, noninvasive treatments may be tried first (eg, intravitreal triamcinolone [eg, Kenalog, Trienescence], topical steroids); for focal lesion with circinate ring in periphery, treatment with focal laser may be adequate; uveitis—for disease in anterior segment, topical treatments tried first; invasive peripheral or systemic treatments used if topicals ineffective; Behcet syndrome and juvenile idiopathic arthritis treated systemically; intermediate uveitis—systemic control used for bilateral disease; localized pericellular treatments available; posterior uveitis—treated first with systemic oral agents

**Suggested Reading**


**Acknowledgments**

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**Estimated time to complete the educational process**

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1. Which of the following are common symptoms of central serous chorioretinopathy (CSC)?
   1. Blurred vision
   2. Color changes
   3. Migraine
   4. Visual acuity of 20/200
   5. Paracentral scotoma
   (A) 1,2,3  (B) 1,2,5  (C) 2,3,4  (D) 2,4,5

2. Risk factors for CSC include all the following, EXCEPT:
   (A) Organ transplantation  (C) Female sex
   (B) Gastroesophageal reflux disease  (D) Lupus erythematosus

3. Which of the following imaging modalities is most effective for highlighting choroidal vasculature in patients with CSC?
   (A) Indocyanine green  (C) Fundus autofluorescence
   (B) Optical coherence tomography  (D) Fluorescein angiography

4. When treatment is required for a patient with CSC, which of the following is recommended?
   (A) Half-fluence photodynamic therapy  (C) Ranibizumab
   (B) Mifepristone  (D) Ketoconazole

5. A 2015 study assessed whether seeing the results of fluorescein angiography (FA) after viewing color photographs influenced the recommendations of experts assessing retinopathy of prematurity. Which of the following was found?
   (A) FA rarely changed management
   (B) FA often led to recognition of more severe disease
   (C) FA often led to recognition that the disease was less severe than initially believed
   (D) FA is not indicated unless the clinical diagnosis is in question

6. A survey in the United Kingdom found which of the following to be the most common infectious cause of acute retinal necrosis?
   (A) Herpes simplex type 1 (HSV-1)  (C) Toxoplasmosis
   (B) Herpes simplex type 2 (HSV-2)  (D) Varicella zoster

7. Which of the following is the preferred treatment for uveitis caused by acyclovir-resistant HSV?
   (A) Famiciclovir  (B) Ganciclovir  (C) Foscarnet  (D) Valganciclovir

8. Which of the following demographic groups is disproportionately affected by syphilitic posterior placoid chorioretinitis?
   (A) Young women  (C) Young men
   (B) Middle-aged women  (D) Middle-aged men

9. Which of the following is used to monitor response to treatment and disease activity in patients with syphilitic uveitis?
   (A) Fluorescent treponemal antibody absorption test
   (B) Treponema pallidum hemagglutination test
   (C) Venereal Disease Research Laboratory test
   (D) Rapid plasma reagin test

10. Which of the following therapies has been shown to be efficacious for cystoid macular edema in clinical trials?
    (A) Indomethacin  (C) Nepefenac
    (B) Bromfenac  (D) All the above