QUICK REFERENCE GUIDE

Care of the Patient with Primary Angle Closure Glaucoma

American Optometric Association

A. DESCRIPTION AND CLASSIFICATION

The glaucomas are a group of ocular diseases with various causes that are ultimately associated with progressive optic neuropathy leading to loss of vision:

- ❑ Primary glaucomas — not related to another underlying condition
- ❑ Secondary glaucomas — related to ocular or systemic diseases

Angle closure glaucoma (ACG) is classified by the presence or absence of pupillary block and whether the angle closure mechanism is primary or secondary. In primary ACG, intraocular pressure (IOP) becomes elevated because the peripheral iris prevents aqueous from reaching the anterior chamber drainage tissue (trabecular meshwork) which itself is presumed to function normally.

B. RISK FACTORS

- ❑ Race: No clear genetic pattern exists; however, certain racial groups are at increased risk; rare among African Americans
- ❑ Family History: First-degree relatives of persons with primary ACG are at risk
- ❑ Age: Rare below age 40; prevalence increases with age, frequently peaking in sixth and seventh decades of life
- ❑ Gender: Women more susceptible than men due to shallower anterior chamber depths and narrower angles
- ❑ Refractive Error: More frequent in hyperopic eyes than in emmetropic or myopic eyes

C. COMMON SIGNS, SYMPTOMS AND COMPLICATIONS

Signs and symptoms of primary ACG vary with the nature of the condition. Table 1 provides an overview of the signs, symptoms, and complications associated with each stage of ACG.

D. EARLY DETECTION AND PREVENTION

Persons at risk for primary ACG are generally free of symptoms. An acute attack, which may occur naturally following emotional upset or under dimly illuminated conditions or result from a variety of systemic and topical medications, can lead to blindness within hours or days. Prophylactic treatment can protect the eye against acute episodes. Since only certain eyes have small enough anterior chambers and narrow enough angles for primary angle closure, evaluation of the anterior chamber angle depth should be performed as part of a comprehensive eye and vision examination. The three main methods for determining anterior chamber depth are:

- ❑ Penlight shadow test
- ❑ van Herick angle estimation technique
- ❑ Gonioscopy

NOTE: This Quick Reference Guide should be used in conjunction with the Optometric Clinical Practice Guideline on Care of the Patient with Primary Angle Closure Glaucoma (Reviewed 2001). It provides summary information and is not intended to stand alone in assisting the clinician in making patient care decisions.

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E. EVALUATION

Evaluation of a primary ACG suspect should include, but is not limited to, the following areas:

1. Patient History

- ❑ Symptoms suggestive of prior angle closure attacks, often relieved by sleep, exposure to bright light, or induced miosis
- ❑ Review of medical history (i.e., cardiac, renal, and pulmonary status) to rule out contraindications to the medical treatment of primary ACG
- ❑ Family history of primary ACG

2. Ocular Examination

- ❑ Refraction (unless the patient is in acute angle closure)
- ❑ Biomicroscopic evaluation of the anterior segment
- ❑ Tonometry
- ❑ Gonioscopy
- ❑ Stereoscopic evaluation of the optic nerve
- ❑ Baseline photographs of the optic nerve
- ❑ Baseline visual fields

3. Provocative Testing

The following tests may be considered for high risk patients, but they offer little additional diagnostic information in most instances:

- ❑ Dark room test
- ❑ Prone test
- ❑ Prone dark room test
- ❑ Mydriatic test

4. Assessment and Diagnosis

In examining patients with signs and symptoms suggestive of ACG, the clinician must differentially diagnose primary ACG from one of the secondary ACGs or some other cause of acute rise in IOP. Differential diagnoses may include:

- ❑ Open angle glaucoma with unusually high IOP
- ❑ Malignant glaucoma
- ❑ Angle mass
- ❑ Glaucomatocyclitic crisis
- ❑ Plateau iris syndrome
- ❑ Early neovascular glaucoma
- ❑ Iridocorneal endothelial syndrome

F. MANAGEMENT

Table 2 provides an overview of the evaluation and management of patients suspected of or diagnosed with primary ACG.

1. Basis For Treatment

Treatment of acute primary ACG with pupillary block is directed toward three goals:

- ❑ Rapid breaking of the attack using medical therapy, laser therapy, or surgery
- ❑ Performance of laser peripheral iridotomy (LPI) or surgical iridectomy (usually after attack has been broken medically)
- ❑ Evaluation for treatment of the fellow eye

2. Available Treatment Options

- ❑ Pharmaceutical management (e.g., use of miotics, beta blockers, alpha-adrenergic agonists, topical steroids, oral carbonic anhydrase inhibitors, and oral hyperosmotic agents)
- ❑ Corneal indentation
- ❑ Laser therapy (e.g., laser peripheral iridotomy or laser peripheral gonioplasty)
- ❑ Surgery (e.g., surgical iridectomy, filtering surgery, trabeculectomy, or goniosynechialysis followed by gonioplasty or iridotomy)
- ❑ In patients who have suffered permanent vision loss, low vision evaluation and prescription of appropriate low vision optical devices

3. Recommended Management Protocol

Immediately after diagnosis of acute primary ACG, the patient should receive the following medications, providing no contraindications exist:

- ❑ 500 mg acetazolamide orally (use two 250 mg tablets)
- ❑ One drop of 0.5% timolol (use 0.25% betaxolol if patient has pulmonary condition)
- ❑ One drop of 2% pilocarpine (use every 15-60 minutes up to a total of 2-4 doses)
- ❑ One drop of 1% apraclonidine

IOP readings should be checked every 15-30 minutes.

- ❑ If attack is not broken in 1 hour, oral hyperosmotics (e.g., oral glycerin, or Isosorbide if patient has diabetes) may be administered and all topical medications repeated.
- ❑ If attack is not broken in 2 hours, argon (or diode) laser gonioplasty should be performed.

- ❑ If angle closure persists 4-6 hours after initiation of treatment, emergency laser peripheral iridotomy or surgical iridectomy should be performed.

When IOP falls to 20 mm Hg or below, gonioscopy should be performed to confirm the angle is open.

4. Patient Education

- ❑ Review signs and symptoms of an acute angle closure
- ❑ Instruct patient to seek care immediately if any of these signs or symptoms are noted
- ❑ Encourage all first-degree relatives of patient to have a comprehensive eye and vision examination

5. Prognosis and Followup

Patients with primary ACG should not be considered cured even after successful LPI. Such patients should be considered glaucoma suspects for life and receive appropriate followup care. Table 2 provides a summary of the frequency and composition of followup evaluations for patients with primary ACG.

Low vision rehabilitation services, including use of specialized optical devices and training, should be provided to patients with ACG who suffer permanent vision loss.

TABLE 1

Common Signs, Symptoms, and Complications of Primary ACG

Type	Onset	Symptoms	Signs	Complications
Subacute ACG	Attacks increase over time	Vary on basis of IOP, patient's pain threshold, and race	Incomplete angle closure that resolves spontaneously	Chronic primary ACG or acute angle closure attack; Peripheral anterior synechiae; Permanent increase in IOP
Acute ACG	Rapid development and progression	Redness, ocular pain, blurred vision, halos around lights, tearing, photophobia, nausea/vomiting, headache	Rapid rise in IOP, usually unilateral	Optic nerve damage and vision loss
Chronic ACG	Slow	Mild or absent until very late in disease	Optic nerve and visual field changes and a narrow angle	Peripheral anterior synechiae; Permanent increase in IOP
Plateau Iris Configuration	Varies	Symptom free unless ACG develops	Flat central iris and sharp turn of peripheral it is posteriorly into ciliary body	Acute or subacute primary ACG

TABLE 2*

Frequency and Composition of Evaluation and Management Visits for Primary ACG

		Composition of Followup Evaluations					
Type of Patient	**Frequency of Evaluation**	**Tonometry**	**Gonioscopy**	**Slit Lamp**	**Optic Nerve Assessment**	**Automated Perimetry**	**Management Plan**
Primary ACG suspect (new)	Every 3-4 months for 1 year	Yes	Critical for diagnosis; every visit	Evaluate for signs of prior angle closure attacks	Dilate with stereoscopic evaluation every visit; baseline photos	Baseline threshold central visual fields	Discuss signs and symptoms of acute angle attack and risk/benefit of LPI
Primary ACG suspect (established)	Every 6-12 months	Yes	Every visit	Evaluate for signs of prior angle closure attacks	Dilate with stereoscopic evaluation every visit; repeat photos every 2-3 years	Repeat every 1-2 years	Review signs and symptoms of acute angle attack
Primary ACG acute attack	Every 24-48 hrs. until LPI 1 wk after LPI 1 mo after LPI 2 mo after LPI 6 mo after LPI	Yes	Critical for diagnosis; if poor view due to corneal edema, evaluate fellow eye	Evaluate for signs of angle closure	May not be possible due to corneal edema; defer until attack is broken	Defer until attack is broken	Break attack medically; LPI; evaluate fellow eye for LPI
Primary ACG acute attack (following LPI)	Every 6 months for 1 year, then annually	Yes	Every visit	Evaluate for patency of iridotomy	Dilate with stereoscopic evaluation every visit; repeat photos every 1-2 years	Repeat every 1-2 years	Review

*Adapted from Figure 2 in the Optometric Clinical Practice Guideline on Care of the Patient with Primary Angle Closure Glaucoma.