



The ROYAL COLLEGE of
OPHTHALMOLOGISTS

Clinical Guidelines

The Management Of Angle-Closure Glaucoma

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Executive Summary

Glaucoma is a leading cause of blindness affecting an estimated 80 million people worldwide. Although primary open angle glaucoma (POAG) affects approximately three times as many people globally as does PACG primary angle-closure glaucoma (60 million versus 20 million), the numbers of people blinded by POAG (5.9 million) and PACG (5.3 million) are roughly equal. Over 1 million people in Europe and 160,000 people in the UK have PACG causing visual field loss. Although Asian people are at higher risk of this condition, these figures relate to the white/Caucasian population. PACG causes a higher rate of severe visual loss than does POAG. The greater propensity of PACG to cause serious loss of vision makes clinicians justifiably cautious in managing this condition and has prompted many to consider preventive treatment. These guidelines cover primary angle-closure only and specifically excludes secondary disease such as that resulting from uveitis or neovascularization.

This guideline has been written primarily for clinicians involved in eye care in the community and in hospital eye services and aims to inform clinicians on 4 main points

1. What is the accuracy of current diagnostic tests
2. What is the effectiveness of different interventions
3. When to refer to hospital eye services
4. When to discharge to community

The natural history of PACG is typically divided into three stages.

1. Suspected primary angle-closure: those affected are called primary angle-closure suspects (PACS). In this stage of the condition, there is contact between the iris and the trabecular meshwork but the intraocular pressure (IOP) is normal, there are no acquired adhesions between the iris and the corneoscleral coat (peripheral anterior synechiae – PAS). The optic nerve structure and visual function are normal.

2. Primary angle-closure (PAC) is the second stage in which the IOP has become elevated (either previously or currently), and/or there are peripheral anterior synechial scars that have developed between the iris and the trabecular meshwork. In this stage there is no evidence of glaucomatous damage to the optic nerve nor any visual field abnormality.
3. The third stage is the development of glaucoma (PACG). It is possible for patients to develop PACG without elevated IOP having been detected and also in the absence of PAS.

Recommendation for Diagnosis

While gonioscopy remains the definitive examination for diagnosis and monitoring of angle-closure disease, anterior segment OCT is proving a useful supplement. In secondary care, OCT may be used in place of gonioscopy for triage or referral refinement.

Recommendations for Management

The last decade has seen important advances in the evidence informing the management of PACG. Central to this has been a shift in emphasis towards the use of phacoemulsification clear lens extraction (phaco/CLE) solely to improve intraocular pressure (IOP) control. The randomised controlled trial (EAGLE) demonstrated significant benefits for phaco over laser iridotomy for IOP control, medication burden, health economic benefits and, crucially, patient-reported quality of life. It is therefore strongly recommended that phaco/CLE be regarded as the definitive intervention for primary angle-closure with IOP >30 mmHg and PACG. The more widespread use of phaco/CLE in less advanced angle-closure cases is a research priority. In other circumstances, phacoemulsification and IOL should be offered in line with cataract surgery guidance.

A second important finding has been a large randomised controlled trial examining the benefits of prophylactic laser peripheral iridotomy (LPI) in people with anatomically narrow drainage angles but no other abnormality (i.e. normal IOP and no glaucoma). The trial's primary finding was that the risk of developing primary angle-closure was 1/1000 at risk eyes/year. The main endpoint detected was peripheral anterior synechiae (PAS). The relevance of PAS to visual prognosis is unproven, and is presumed to be (significantly) less than elevated IOP and glaucoma. There was no incident glaucoma identified over the six year trial follow-up period. Acute episodes of angle-closure were extremely rare in both treated and untreated groups. The trial demonstrated a 50% reduction in risk of angle-closure in eyes that underwent prophylactic LPI. In this context, and with the evidence supporting more widespread use of SLT laser for ocular hypertension and POAG, together with the unprecedented backlog in healthcare caused by the COVID-19 pandemic, **we recommend *against* the widespread, routine usage of prophylactic LPI in the NHS.** We identify a group of individuals having additional risk factors that may be suitable for prophylactic LPI, called PACS-Plus. We recommend people who do not meet these "plus" criteria be monitored with annual NHS sight tests in the community from now on. Prompt LPI is recommended for all affected and contralateral eyes when acute (symptomatic) angle-closure has occurred.

“PACS PLUS” Criteria for Referral of People with Suspected Occluded Angles

Angle Criteria

Either – a limbal chamber depth grade $< \frac{1}{4}$

Or – an anterior segment OCT showing irido-trabecular contact (ITC)

PLUS: one of the following criteria

- “Only eye” status for occupation or independent living
- Vulnerable adults who may not report ocular or vision symptoms
- Family history of significant angle closure disease
- High hypermetropia ($> + 6.00$ dioptres)
- Diabetes or another condition necessitating regular pupil dilation
- Those using antidepressants or medication with an anticholinergic action
- People either living in remote locations (such as foreign aid workers, armed forces stationed overseas or oil rig workers etc.) where rapid access to emergency ophthalmic care is not possible

The finding of “PACS PLUS” should trigger referral to a Local Treatment Provider

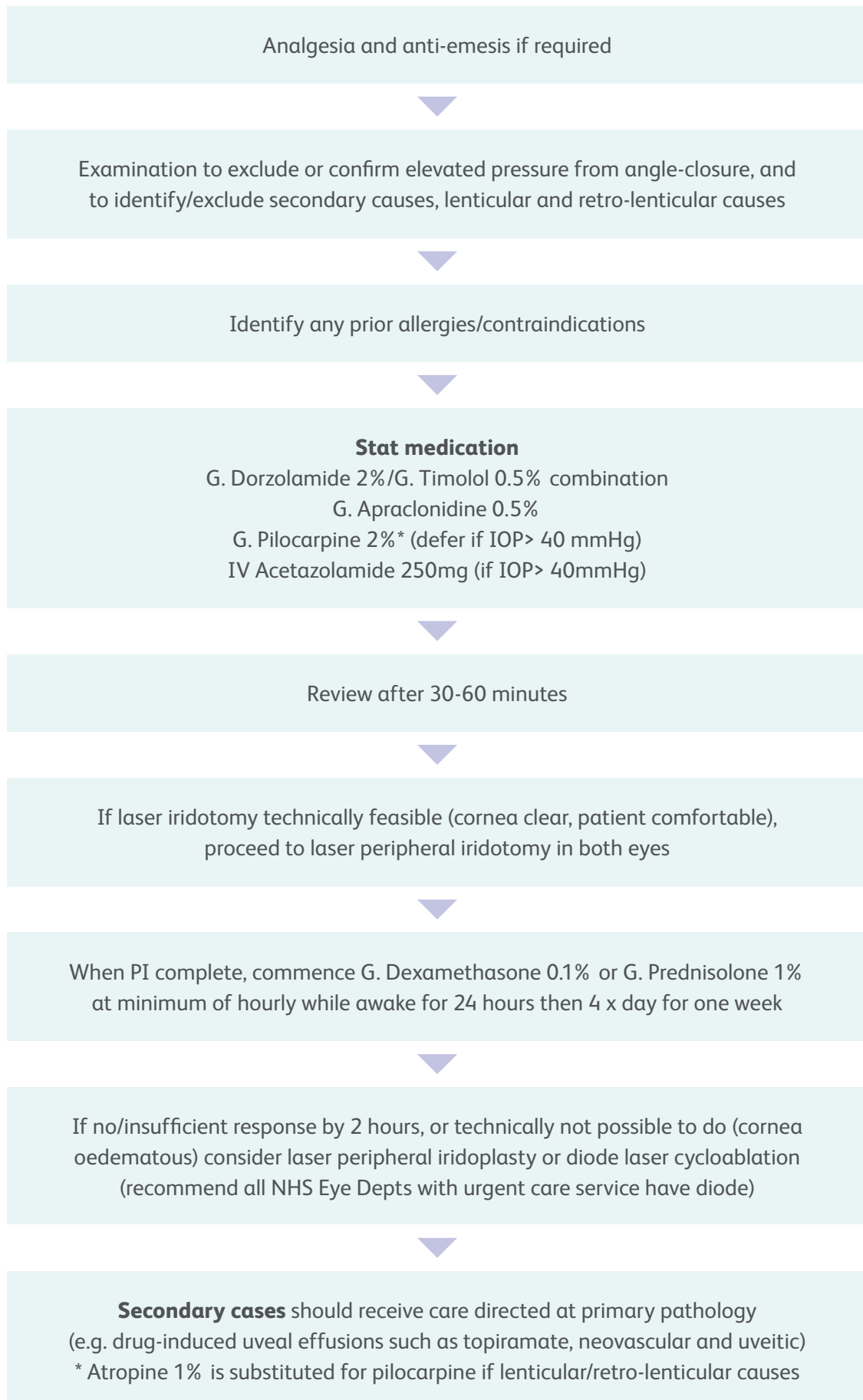
“PACS MINUS” If an individual has the angle-characteristics specified above but none of the “plus” criteria, and does not meet NICE glaucoma referral guidelines, they should be advised to seek an annual NHS sight test.

We identify a range of interventions for which evidence of benefit is weak or absent in PACG. Among these are goniosynechiolysis, laser iridoplasty for residual iridotrabecular contact, and minimally invasive glaucoma surgery (MIGS). These are currently not advised outside of approved research protocols. There appears to be no benefit in discontinuing anticoagulants prior to laser iridotomy, and the position of laser iridotomy appears to have no clear impact on the rate of dysphotopsia. Sequential green “argon”/YAG LPI is preferred in dark irides (for example, those of Asian/African descent). Prostaglandin monotherapy is effective in lowering IOP in PACG, and out-performs timolol. There is no benefit of one PGA over another.

Combined, or sequential, phaco/CLE and trabeculectomy may be appropriate in some more advanced cases but it is very clear that the complication rate is significantly higher when patients with angle-closure undergo a trabeculectomy.

The management of patients with small eyes (axial length < 20 mm) is challenging. These people are at significantly greater risk of intra operative and post-operative complications from phaco/CLE, and typically have a lesser visual potential than eyes with an axial length > 20 mm. Detailed discussion of the benefits and drawbacks of surgery, together with careful planning of any intervention, is advised.

Acute Angle Closure Care Pathway (pupillary block or plateau iris mechanism)



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