Moorfields Eye Hospital NHS Foundation Trust

NHS National Institute for Health Research

Surgery for angle closure: Tackling difficult cases

Winifred Nolan FRCOphth MD
Consultant Ophthalmologist
Glaucoma Service
Moorfields Eye Hospital, London

Operating on angle closure eyes

- Potential problems and pitfalls
- Intra and post-operative complications
- Tips for avoiding problems

Lens/ cataract surgery

Preparing for surgery

- Spend time on pre-op counseling and consent

Discuss:

- Aqueous misdirection
- CMO
- Corneal decompensation
- Refractive outcome
- Other eye

★ Look at the biometry before day of surgery!

Biometry and refractive outcome

- Use 3rd or 4th generation theoretical formula
  - ➔ Predict IOL position in eye
- Effective lens position (where IOL settles post-op) more difficult to predict in small eyes
- Risk of myopic surprise (esp post LASIK)
- Hoffer Q, Holladay 1 or Haigis, Olsen, Barrett
- Hoffer Q consistently evidenced as predictable in small eyes
- In most cases aim for emmetropia or hyperopia

Aristodemou P, Cartwright NE, Sparrow J et al. J Cataract refract surgery 2011;37:63-71

ARTICLE

Formula choice: Hoffer Q, Holladay 1, or SRK/T and refractive outcomes in 8108 eyes after cataract surgery with biometry by partial coherence interferometry

Petros Aristodemou, FRCOphth, Nathaniel E. Knox Cartwright, MRCOphth, John M. Sparrow, DPhil, FRCOphth, Robert L. Johnston, FRCOphth

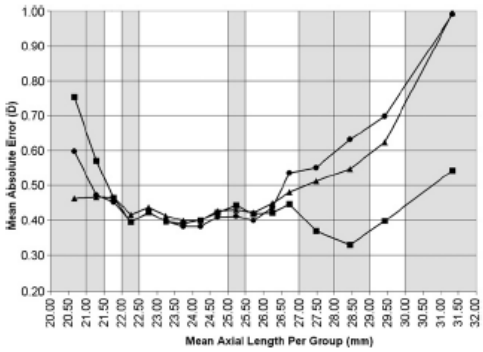


Figure 1. Mean absolute error plotted against AL for the Hoffer Q formula (*triangles*), Holladay 1 formula (*circles*), and SRK/T formula (*squares*) for the Sofport IOL sample. The gray shading shows the groups with statistically significant differences in MAE.

ARTICLE

Factors related to corneal endothelial damage after phacoemulsification in eyes with occludable angles

Yu-Chieh Ko, MD, Catherine Jui-ling Liu, MD, Ling-Ing Lau, MD, Chih-Wei Wu, MD, Joe C. Chou, MD, Wen-Ming Hsu, MD

J Cataract Refract Surg 2008; 34:46–51

CONCLUSIONS: The corneal endothelial cell loss after phacoemulsification in eyes with occludable angles was associated with preoperative AL measurement and postoperative IOP within 24 hours. To minimize corneal endothelial cell damage, it is critical to avoid an IOP spike during the early postoperative period and to exercise extreme caution intraoperatively in eyes with an AL less than 22.6 mm.

Effect of a Previous Acute Angle Closure Attack on the Corneal Endothelial Cell Density in Chronic Angle Closure Glaucoma Patients

Clement C. Y. Tham, FRCS,† Yolanda Y. Y. Kwong, FRCS,*‡ Jimmy S. M. Lai, MD, FRCOphth,*§ and Dennis S. C. Lam, FRCS, FRCOphth*‡*

Conclusions: A previous acute angle closure attack correlates with a significantly reduced corneal endothelial cell density in CACG patients.

J Glaucoma • Volume 15, Number 6, December 2006

Surgery – Tips for avoiding problems

Iris prolapse

- ➔ Long anterior corneal wound and paracentesis
- ➔ Intracameral phenylephrine, iris hooks, ring

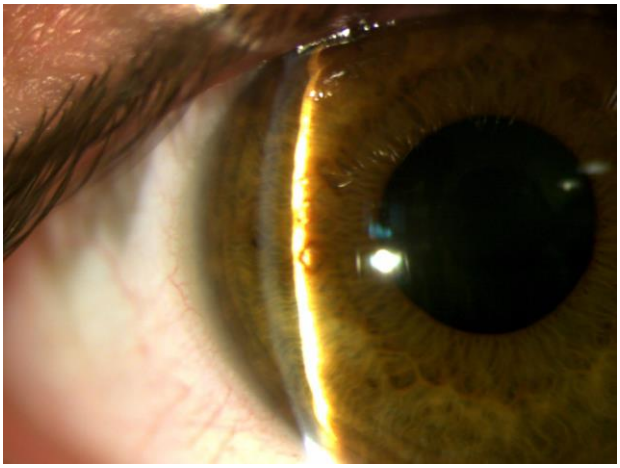
Poor view due to corneal oedema

- ➔ General Anaesthesia, vision blue

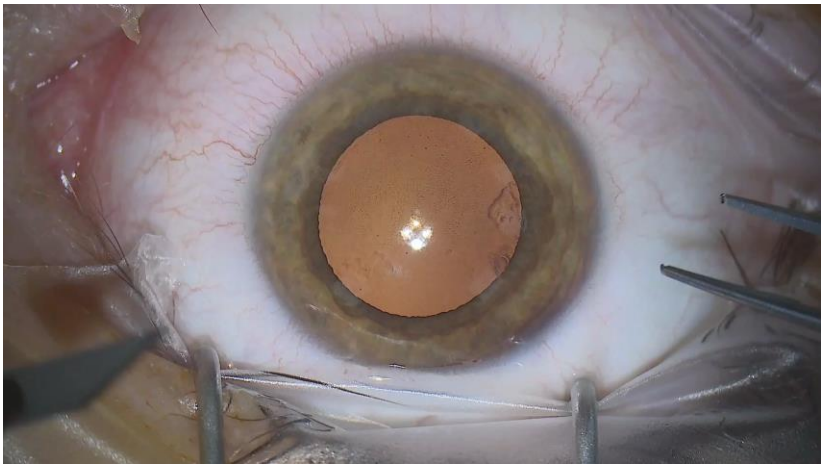
Shallow unstable Anterior chamber, bulgy vitreous

- ➔ AC maintainer
- ➔ Careful hydrodissection
- ➔ Small anaesthetic volume or GA

Zonular weakness



- 24 yr old woman
- Iridotomies
- Recurrent symptoms
- PAS
- Axial length: 21.05mm



Post-op complications

Corneal decompensation

- ➔ Soft shell technique
- ➔ Avoid IOP spike, post-op Diamox

Aqueous misdirection

- ➔ Counsel patient, Surgical PI, Atropine,

Fibrinous uveitis and Cystoid macular oedema

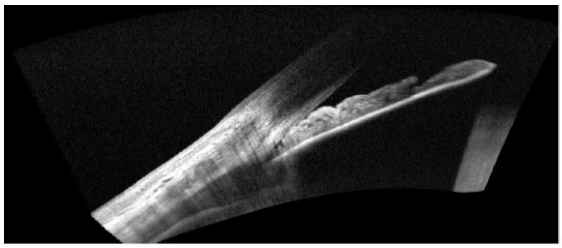
- ➔ Frequent topical steroids

Refractive surprise

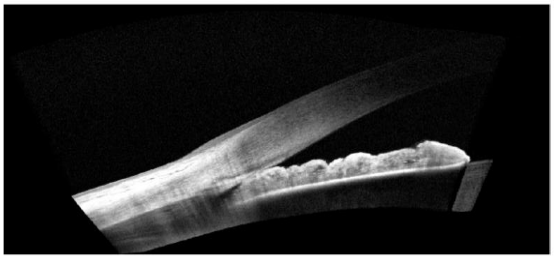
Case example

- 48 year old female
- Hyperopic LASIK
- Bilateral Acute Angle Closure 2011– Laser iridotomies
- Residual Iridotrabecular contact
- Stable for several years
- Noticeably shallower AC and symptoms suggestive of angle closure
- IOP, Discs and VF normal

Anterior Segment OCT



Right temporal angle



Left nasal angle

Management?

Plan: Right Clear lens extraction + IOL

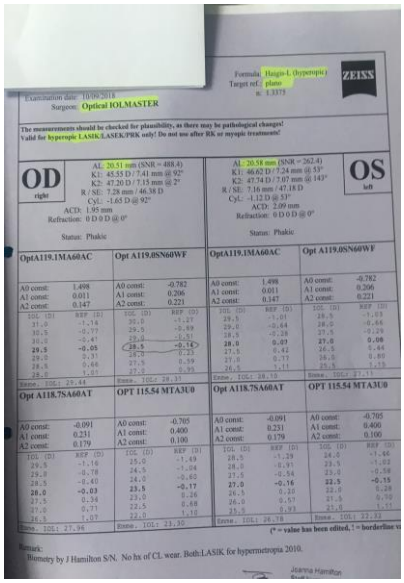
Risks: Aqueous misdirection, refractive surprise

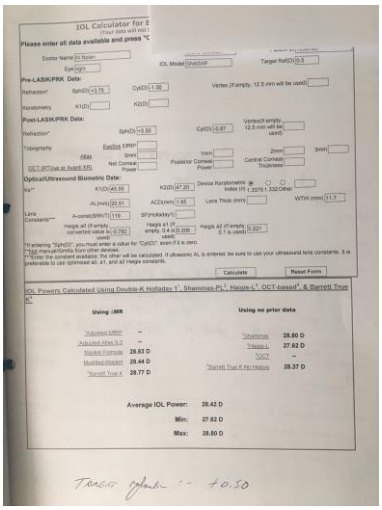
Biometry: Axial length = 20.06mm

Patient requested low myopia for reading and computer work

- Uncomplicated surgery under GA

Biometry





1 week post op:

VA = 6/18
AC – Central and peripheral shallowing
IOP – 14mmHg
Autorefraction = -1.50 D

Diagnosis = Aqueous misdirection

Treatment

- Atropine 1% bd – Good response
- YAG capulotomy and hyaloidotomy – central and peripheral

Stopped Atropine 1 week later

↓

Attended Emergency department with pain + blurred vision

↓

IOP 40mmHg RE and shallow AC

Options

1. Long term Atropine
2. Ciliary body cyclodiode laser
3. Pars plana vitrectomy

↓

20 shots , 1500 mw, 1500ms

<u>1 week Post –op :</u>

- AC deeper, IOP normal
- VA = 6/6
- Auto-refraction = -0.75

Aqueous misdirection

- Always anticipate in small eyes
- Myopic refractive error unusual in small eyes post-phaco
- IOP may be normal

Differential diagnosis

	Aqueous misdirection	Pupil block	Suprachoroidal Haemorrhage	Serous choroidal effusions
IOP	→ Or ↑	↑	→ Or ↑	↓
AC depth	Shallow peripheral + CENTRAL	Shallow peripheral	Flat peripheral + Central	Shallow peripheral + Central
Relieved by iridectomy?	No	Yes	No	No
Fundoscopy	Normal	Normal	Dark choroidal elevations	Choroidal elevations

Treatment

- Atropine
- YAG hyaloidotomy

- Acute ➔ Cyclodiode laser

- Chronic with PAS and disc damage
  ➔ Pars plana vitrectomy +/- aqueous shunt

- Plan for fellow eye surgery

Summary

- Spend time counseling patients for surgery
- Prepare for aqueous misdirection in small eyes
- Plan and review biometry well before day of surgery
- Lens and cataract surgery achieve good results in most cases