

Refractive Phacoemulsification



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Why Refractive Phacoemulsification?

- Value added service
- Enhanced patient satisfaction
- Avoid refractive complications such as anisotopia
- Decreased need for patient visits, need for temporary glasses decreased



Refractive Surgery

- What defines a good refractive surgery?
 - Accuracy of result
 - Repeatability of result
 - Stability of result
 - Safety...low complication rate
 - Availability of enhancements



Can Cataract Surgery be a Good Refractive Surgery?

- Accuracy of result

- Accuracy depends on preoperative workup
- Dependable A-scans, keratometry
- Choice of instruments key consideration
- Personalized A-constants developed with periodic review of results
- Calculation formulas need to be reviewed for accuracy in different situations



A-scan tips

- Hand held scans are inherently inaccurate
- Remember that accuracy to 0.5D requires about 150 micron A-scan accuracy
- This requires:
 - precise positioning
 - minimal or no pressure on cornea
 - a wet cornea
 - good spikes

A-scan room



A-scan room



Probe support

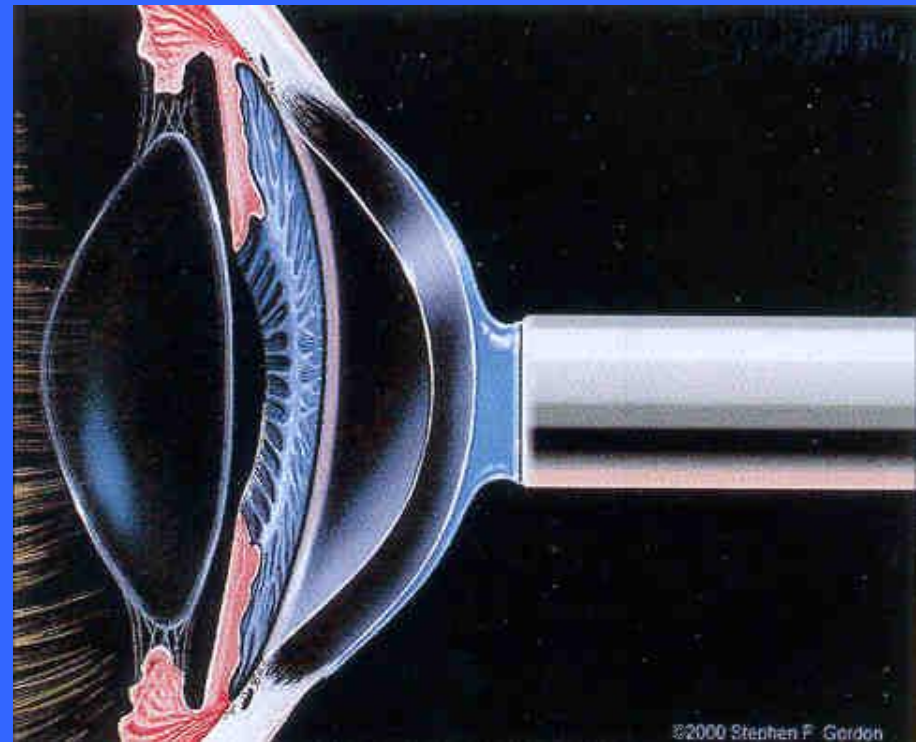
Storz A-scan attached to slitlamp

- Remember that A-scans attached to tonometry arm will applanate the cornea
- This can result in significant inaccuracy



Touch and go method

- Before getting actual reading, we touch the cornea and then retract until probe lifts off
- This gives the general range of readings to aim for
- Then we attempt to get the number with good spikes



IOL Master

- This device measures the length of the eye with laser interference tomography
- Good axial lengths..not so good on curvature
- Best in mild cataract and clear lens



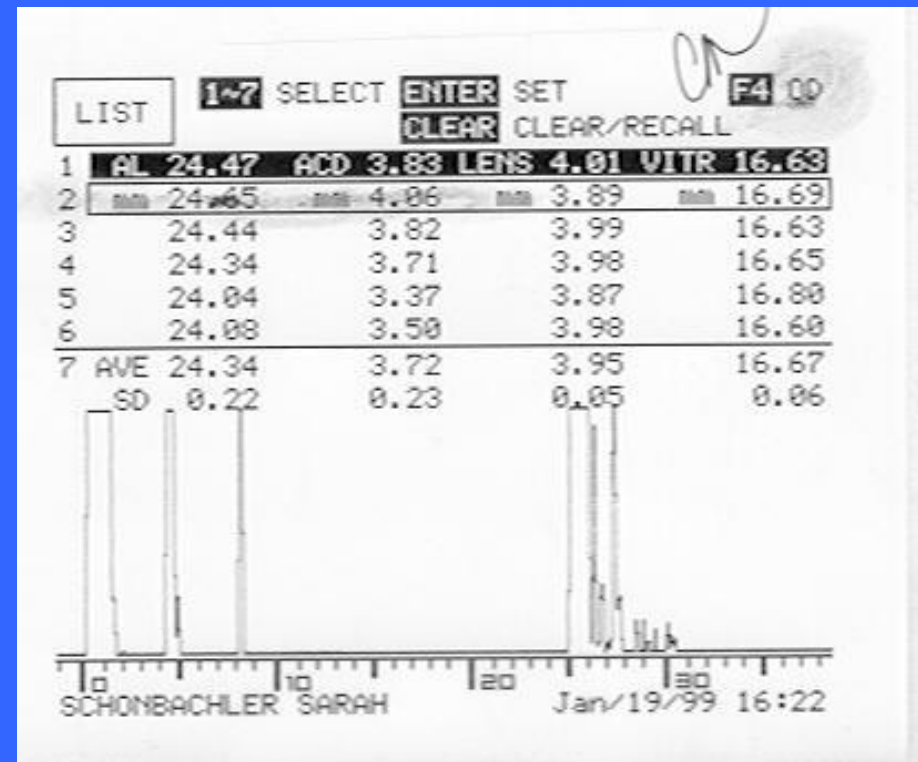


General rules

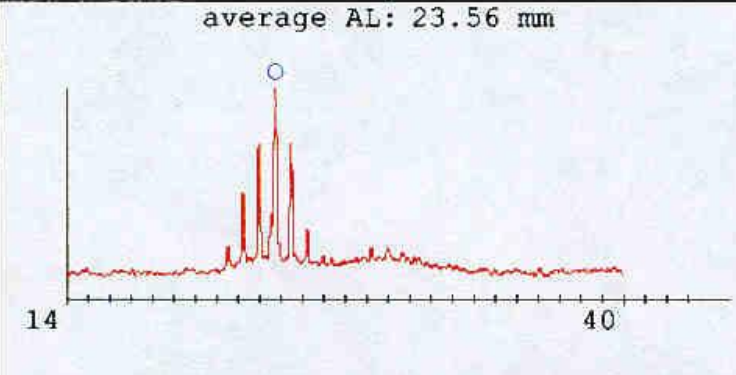
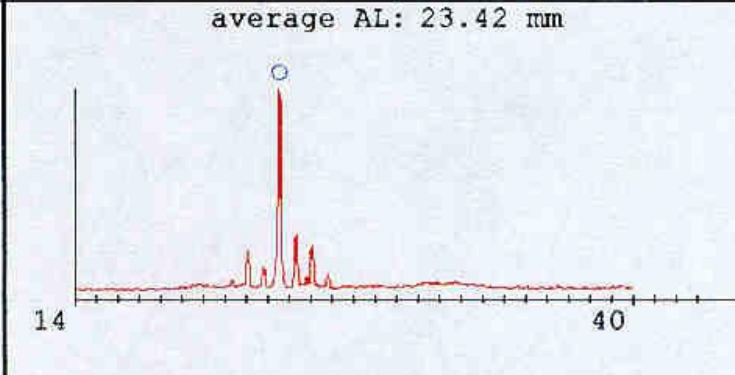
- The two eyes should usually match in terms of a-scans
- Assymmetrical refractions may reflect assymetrical a-scans
- For sulcus placement subtract 1 diopter
- For piggyback IOL add 1 diopter
- Aim for -2 D for monovision

A-scan spikes

- Keep probe slightly nasal and central
- Clean spikes indicate that reading does not go through iris
- First and last spike must be full height or bad reading



IOL Master

OD (right)		axial length values				OS (left)	
AL	SNR	AL	SNR	AL	SNR	AL	SNR
23.54 mm	4.1			23.43 mm	9.5		
23.51 mm	3.6			23.42 mm	8.8		
23.56 mm	3.0			> 23.43 mm < 16.5			
> 23.58 mm < 7.4				23.40 mm	8.0		
23.57 mm	4.8			23.43 mm	14.5		
23.59 mm	3.6			23.40 mm	9.7		
average AL: 23.56 mm				average AL: 23.42 mm			
							

IOL calculation

- The HofferQ program has been very reliable in our practice (3rd generation)
- New features such as outcome analysis and personalized A constant make it our choice for accurate calculations

The screenshot displays the Hoffer Programs - [IOL Power Calculations] software interface. The window title is "Hoffer Programs - [IOL Power Calculations]". The menu bar includes "File", "Hoffer Programs", and "Help". The main window is divided into several sections:

- Patient Information:** Thornton, SIRC, Hoffer S, Personal Values, Studies, Setup.
- Calculation Method:** IOL Calc, Axial Length, Rx Error, IOL w/o AL, Casebeer.
- OD (Right Eye) Data:**
 - PC: Axial Length 23.00, A Constant 119.00, Holladay SF 1.79, Hoffer ACD 5.55, PO Rx -0.50.
 - AC: Axial Length 115.30, Holladay SF -0.58, Hoffer ACD 2.90.
 - K1 43.00 @ 0, K2 44.00 @ 0, Average K 43.50, Corneal Diameter 11.26.
- OS (Left Eye) Data:** Preferred Lenses, Lens Type.
- PC (Right Eye) IOL Power Choices:**

IOL POWER BY	IOL CHOICES	PO Rx by Hoffer Q
SRK/T	23.61	23.5
Holladay	23.68	BEST 24.0
Hoffer Q	23.77	24.5
Average	23.69	25.0
- AC (Left Eye) IOL Power Choices:**

IOL POWER BY	IOL CHOICES	PO Rx by Hoffer Q
SRK/T	19.22	19.0
Holladay	19.17	BEST 19.5
Hoffer Q	18.73	20.0
Average	19.04	20.5

Buttons at the bottom include "IOL Power", "Recalc", "Save", and "Print". The Windows taskbar at the bottom shows the Start button, taskbar icons, and the system tray with the time 10:50 PM.

HofferQ

Preoperative Data:						OD right	
AL: 23.56 mm		Refraction:					
K1: 43.66 D @ 29°		Visual Acuity:					
K2: 44.76 D @ 119°		Eye Status: phakic					
opt. ACD: 3.22 mm		Target. Ref.: plano					
StarrAQ2010V		StarrCQ2005V		AllerganSA40N		AlconMT4U0	
pACD Const:	5.702	pACD Const:	5.26	pACD Const:	4.81	pACD Const:	4.09
IOL (D)	REF (D)	IOL (D)	REF (D)	IOL (D)	REF (D)	IOL (D)	REF (D)
22.0	-1.1	21.0	-1.0	20.0	-0.9	19.0	-1.1
21.5	-0.8	20.5	-0.7	19.5	-0.6	18.5	-0.7
21.0	-0.4	20.0	-0.3	19.0	-0.2	18.0	-0.4
20.5	-0.1	19.5	0.0	18.5	0.2	17.5	0.0
20.0	0.2	19.0	0.4	18.0	0.5	17.0	0.4
19.5	0.6	18.5	0.7	17.5	0.8	16.5	0.8
19.0	0.9	18.0	1.0	17.0	1.2	16.0	1.1

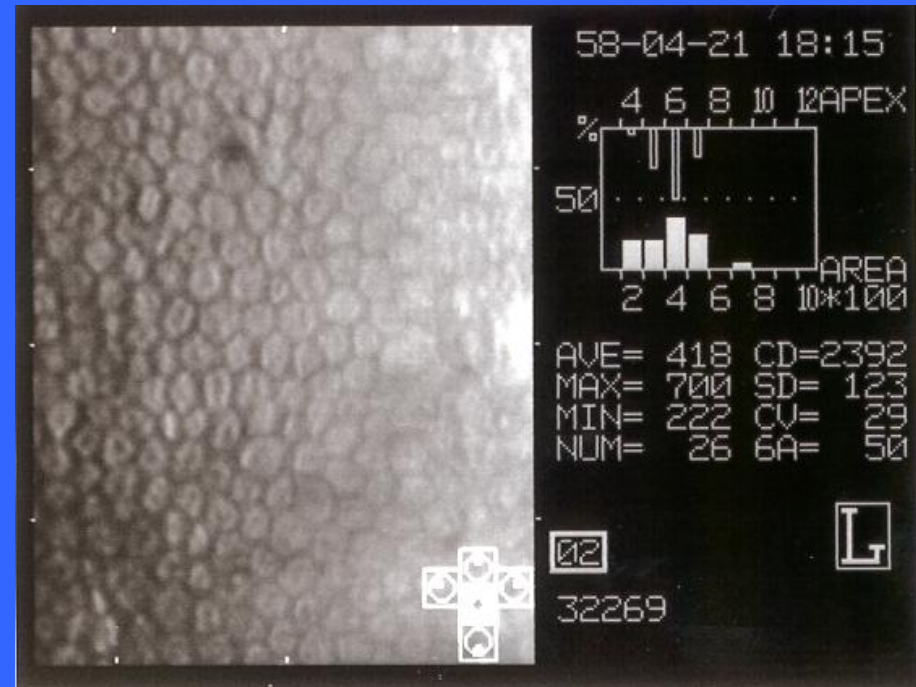


Keratometry

- Best measurement is manual
- Next best is Humphrey autokeratometer (not made anymore)
- Never use topographic k readings
- Combined autorefractors/keratometers are just average for k-readings

Cell Count

- Non touch Konan computerized cell counting ensures the cornea will not be a problem during surgery



Visual Office..Putting it all together

Pre-Op Exam

Patient Name	Dierdorf, John	Technician	bre
Visit Date	05/22/2001	Patient Number	20765
Surgery Name	CE/IOL	DOB	03/05/1959
Surgery Eye	OD	Age	42
Surgery Note		Surgery Date	05/24/2001

OD	Uncorrected	Corrected(Glasses)
OS	CF	20/ 80

Pam	Glare	Cell Count	Focus
20/ 20	LP	2645	DISTANCE
		0	DISTANCE

Glasses Prescription Distance Remarks:

-8.50 + 1.00 X 137 Prism 0
-7.25 + 1.00 X 19 Prism 0

Auto Refraction

-14.25 + 1.50 X 115
+0.00 + 0.00 X 90

Keratometry

45.25 / 45.75 X 93 Astig: 0.50
0.00 / 0.00 X 0 Astig: 0.00

ASCAN

Axial	ACD	Planned Refraction
27.18	3.76	-0.50
0.00	0.00	0.00
Primary IOL Power		Backup IOL Power
8.00 Bag		8.00 Bag
0.00		0.00

Primary IOL Style

Staar AQ-2010V C Haptics ACONST 119.00
Silicone Foldable/C loops/Biconvex/13.5 mm

Backup IOL Style

Staar AQ-2010V C Haptics ACONST 119.00
Silicone Foldable/C loops/Biconvex/13.5 mm

S-31-01 CE EPCIOL Phaco Block OD
Dr. Cohnigan

COMPLETED
iller



Surgical issues

- We do surgery 1 day to 1 week apart .. Think of patient in refractive terms, try ctl and possible monovision on other eye
- Better surgery results in more predictable results..faster surgery with complications can add many unnecessary postop visits and slow visual recovery
- Use astigmatically neutral surgery



After surgery

- Three main issues:
 - Capsular opacification
 - Astigmatism
 - Spherical error
- We see at 1D, 2W and 1-2M
- Do astigmatism at slitlamp..ATR sooner / WTR later since it may degrade
- Do IOL exchange for spherical error



Summary

- Refractive phaco is a state of mind
- Losing on a few cases with reoperations will be repaid with many other happy patients without reops
- Think refractive! .. Early relaxing incisions..astigmatically neutral incisions..and ctl for spherical errors will increase satisfaction and decrease visits

Refractive Phaco...sphere

