Basic Phaco Course

To be a complete phaco surgeon you should have a verity of strategies to be able to deal with all cataract grades from Soft, Medium, Hard and rock-hard
As you learn phacoemulsification, you will find a technique that works for you most of the time.

IN PHACOEMULSIFICATION
ONE SIZE DOES NOT FIT ALL
# SOFT CATARACTS

# Can be problematic for novice phaco surgeons

Conventional cracking or chopping of soft nucleus will not work and will lead to repeated and unnecessary manipulations and potential complications.

This can be as a result of Cheese wiring of the instruments through the soft nucleus.
TECHNIQUES FOR SOFT CATARACT

PHACO FLIP TECHNIQUE 1
PHACO FLIP TECHNIQUE 2

# Good hydrodissection and hydrodelination to obtain cleavage plain circumferentially

# Low ultrasound power (30%)

# Moderate vacuum (300-350mmgh)

# Moderate aspiration flow rate (20-25 ml/min)

PHACO PRECHOP
# MEDIUM CATARACTS

4-QUADRANTS NUCLEOFRACTIS TECHNIQUE
( DIVIDE AND CONQUER)
TRENCHING, SCULPTING, GROOVING

# Start the groove at the proximal margin of the capsulorrhexis. Carry the groove across to the distal margin.

# Keep the tip unoccluded.

# Use phaco power only as you sculpt forward.

Moderate flow, low phaco power, and low vacuum

DEEPENING THE INITIAL TRENCH

# Carry the groove posteriorly until you see a good fundus reflex.

# Three times the width of the phaco tip is usually deep enough for most nuclei.

# The lens is a biconvex structure so focus the deepening on the centre rather than peripherally.

Divide & Conquer
CRACK THE NUCLEUS

# Place the phaco tip and a second instrument at the base of the groove, distal to the intersection of the two grooves.

# Lateral movement in a horizontal plane is required as the two instruments are pulled apart. Downward pressure should be avoided.

PHACO THE QUADRANTS

# Using higher flow and vacuum levels, engage a nuclear quadrant distal to the intersection of the grooves.

# Impale the quadrant, wait just a moment for vacuum to increase and then draw the quadrant to the center of the pupil in the pupillary plane, and begin emulsification.
PHACO CHOP TECHNIQUES

WHY LEARN CHOPPING?

# Faster, safer surgery
# Reduction in Phaco Energy and Heat Delivery
# Clearer day one corneas
# Ability to break hard nuclei more easily
HORIZONTAL VERSUS VERTICAL CHOP

# In horizontal chopping, the 2 instrument tips move toward each other in the horizontal plane during the chop.

# In vertical chopping, the 2 instrument tips move toward each other in the vertical plane in order to create the fracture.

WHAT ARE THE REQUIREMENTS OF CHOPPING

# A suitable instrument designed for the technique of your choice.

# Appropriate machine power and fluidics parameters that allow nucleus entry and holding for the chopping maneuvers.

# An understand of the mechanical forces required to create chop.
CHOPPERS

STOP AND CHOP

The stop and chop method of Paul Koch is a hybrid of divide and conquer and chopping, which avoids having to make the difficult first unsculpted chop. Although chopping the heminuclei does reduce total phaco time.
STOP AND CHOP

SCULPTING
A longitudinal groove is sculpted in the nucleus. Moderate flow, low vacuum and continuous ultrasound power based on nuclear density is used.

CRACKING
The nucleus is then divided into two hemisections by cracking.

CHOPPING
The settings are then changed to high vacuum, high flow rate and high or hyper-pulse phaco mode. The hemisection is embedded at mid-depth and chopped into two or more pieces.
HORIZONTAL CHOP

The phaco tip impales deeply

Horizontal chopper tip passes beneath the capsulorrhexis to hook the opposite nuclear equator

The chopper tip passes directly toward the phaco tip. The initial compression force generates the fracture

Sideways separation of the 2 tips extends the fracture

After slight rotation of the nucleus, the next chop is initiated by repeating this sequence of
# HARD CATARACTS

OBSTACLES IN PHACO OF HARD NUCLEI

# Lack of good visualization

# leathery posterior plate

# Wound burn

# Endothelial damage
TECHNIQUES OF HARD AND ROCK-HARD CATARACTS

DIVIDE AND CONQUER

Hard and rock-hard cataracts
STOP AND CHOP

The main obstacle is the presence of leathery posterior plate very resistant to crack

Hard and rock-hard cataracts
TIPS FOR CHOPPING HARD CATARACTS

# At least 6mm anterior capsulorhexis

# Lengthen the amount of phaco tip emerging from the sleeve

# Create a space for work under the dispersive OVD before using any power.

Hard and rock-hard cataracts

# Chop slowly with the phaco tip well buried at maximum vacuum

# Multiple separations may be needed in the same chop

# Use power modulations to minimize power dispersion inside the eye when removing segments

After finishing to chop half of the nucleus recoat the corneal endothelium with dispersive OVD.
WHITE CATARACTS

The main issue in white cataracts is the **anterior capsulorhexis** especially in intumescent ones

Usually white cataracts are **brittle**

WHY NOVICE PHACO SURGEON MAY FAIL TO HORIZONTAL CHOP

# Use of inappropriate second instrument

# Loose hold of the nucleus due to
   * superficial hold
   * inappropriate fluidic settings

# Superficial placement of the chopper that **scratches** rather than cutting

# Inappropriate use of chopping forces
DURING LEARNING CURVE OF HORIZONTAL CHOP

# You must know your machine

# Revise the machine parameters before starting the surgery

# Go through the learning curve from divide and conquer, stop and chop and finally direct chop
**THE KEY MESSAGE**

# Augment the rule of mechanical separation to minimize power usage

# Use power modulation to reduce ultrasound power delivery during phaco

# Grade 2 to grade 4 cataracts are ideal for novice phaco surgeon to start with

**THE KEY MESSAGE**

# Never disrespect soft cataracts

# Chopping works better with hard cataracts

# Be flexible to change your strategy when the situation requires
Thank You