2014 ASCRS Course “Phaco Prechop” Takayuki Akahoshi, MD

Basic Concept & Techniques of Phaco Prechop

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Phaco Prechop
“Mechanical nucleofracture performed prior to the phacoemulsification”

Preparation for Prechop
- Corneal Protection
- Complete CCC
- Hydrodissection
- Choice of Instrument

Preparation
- Fill up the anterior chamber with dispersive OVD such as Viscoat
- Make a complete capsulorhexis without tears or notches
- Sufficient Hydrodissection
  - G27 Akahoshi Hydrodissection Cannula (AE-7636) attached to a 2.5cc syringe

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Cortical cleaving hydrodissection for all the cases except for the posterior polar cataract

Fill up the anterior chamber again with Viscoat clearing the anterior cortex on the nuclear surface

Nuclear Support

Karate Prechop

Place the angular side of the prechopper blade at the center of the nucleus

Soft Nucleus
Complete CCC
Intact Zonules

Phaco Prechop (AE-9240)
The angular side blade is sharp, the rounded side blunt
When the whole blade is inserted into the nucleus, open the blades slowly while continue to push the blades down.

When the complete nuclear division has been attained, the inner surface of the posterior capsule can be observed.

Place the closed blades into the distal end of the nucleus.

Open the blades to separate the distal end of the nucleus.

Place the blades into the proximal end of the nucleus.

Open the blades to separate the proximal end of the nucleus. Thus attain complete division from proximal to the distal end.
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Karate Prechop
Restore each bisected nuclear fragment into its original position and rotate the nucleus 90 degrees to prechop into four pieces.

Karate Prechop
Insert the angular side of the blade into the proximal half of the nucleus. The direction of insertion is just downwards.

Karate Prechop
Open the blades slowly while pushing the nucleus downwards. Repeat opening until the posterior plate is completely separated.

Karate Prechop
Insert the angular side of the blade into the distal half of the nucleus. The direction of insertion is just downwards.

Karate Prechop
When the whole blade is inserted into the nucleus, open the blades slowly while continue to pushing the nucleus downwards.

Karate Prechop
Using the blunt rounded side of the blade, ascertain that the nucleus is completely divided from surface to the bottom.
Phaco Prechop with Nuclear Support

- Hard Nucleus
- Incomplete CCC
- Weak Zonules

Counter Prechop

Universal Prechopper (AE-4190) + Nucleus Sustainer (AE-2530)

Counter Prechop

1. Make a complete capsulorhexis 1.0mm smaller than the IOL optic size
2. Insert the prechopper into the center of the nucleus. The tip of the sustainer, center of the nucleus and tip of the prechopper should be aligned on the same axis
3. Bring two instruments closer. By supporting the nucleus, open the blades repeatedly
Using the two instruments, separate the posterior plate of the nucleus completely.

Place the closed blades to the proximal part of the nucleus.

Open the blades to bisect the nucleus from the surface to the bottom, from proximal to the distal end.

Restore each bisected nuclear fragment into its original position and rotate 90 degrees.

By supporting the nucleus with a nucleus sustainer at deep equatorial portion, insert the prechopper blade into the proximal half of the nucleus.

Bisect the proximal half of the nucleus completely.
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**Counter Prechop**
Insert the closed blade into the hardest core of the distal nuclear fragment by supporting with the nucleus sustainer.

**Counter Prechop**
Bisect the distal half of the nucleus completely by repeating the opening action.

**Counter Prechop**
Rotate the nucleus by 45 degrees for further prechop of the quadrants. Smaller fragmentation is more advantageous for the phacoemulsification of the dense cataract.

**Phaco Prechopped Nucleus**
Make a complete occlusion of the phaco tip to the nucleus so that all the U/S energy can be used effectively to emulsify the nucleus.

**Benefit for the sub-2mm MICS**
As the U/S time is very short, the incision can be self-sealed quite easily without hydrating the corneal stroma.

**Key Point**
Complete Separation
Merely making a crack into the nucleus is not enough. What is important is to attain complete division.
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**Complete Phaco Prechop**

- V sign
- A sign

Prechopper can attain the complete division of the posterior plate of the nucleus

**Phaco of Prechopped Nucleus**

- Off-Centered Square Tip (HARMONYX)

**Bevel Down Phaco Burst Mode**

- Divide & Conquer
- Phaco Prechop

U/S Energy Loss (+)  U/S Energy Loss (−)

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**Reference**

- Phaco Chop and Advanced Phaco Techniques, SLACKS Incorporated, 2013

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