Phaco Prechop
by
Hand  
Takayuki Akahoshi
Ultrasound  
Luis Escaf
Luz Marina Melo
Laser  
Alan Crandall
Philippe Crozafon

Phaco Prechop
“Mechanical nucleofracture
performed prior to
the phacoemulsification”

Divide & Conquer

U/S Energy Loss ++

Phaco Prechop

U/S Energy Loss ±
Phaco Prechop

by

1992  Phaco Prechopper
Takayuki Akahoshi

2005  Ultrachopper
Luis Escaf  Luz Marina Melo

2010  Femtosecond Laser
Alan Crandall  Philippe Crozafon

Indication of Prechop

✓ Any Cataract

Contra-indication

✓ None

Phaco Prechop

by

Hand

Takayuki Akahoshi

Preparation for Prechop

✓ Corneal Protection
✓ Complete CCC
✓ Hydrodissection
✓ Choice of Instrument
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**Corneal Protection**
Fill up the anterior chamber with dispersive OVD such as Viscoat

**Complete CCC**
Make a complete capsulorhexis without tears or notches

**Sufficient Hydrodissection**
G27 Akahoshi Hydrodissection Cannula (AE-7636) attached to a 2.5cc syringe

**Sufficient Hydrodissection**
Cortical cleaving hydrodissection for all the cases except for the posterior polar cataract
Expose the Nuclear Surface
Fill up the anterior chamber again with Viscoat clearing the anterior cortex on the nuclear surface

Methods of Prechop

Nuclear Support

- Karate Prechop

Nuclear Support

+ Counter Prechop

Preparation for Prechop

Karate Prechop
Phaco Prechop without Nuclear Support

- Soft Nucleus
- Complete CCC
- Intact Zonules

Karate Prechop

Combo Prechopper
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**Karate Prechop**

**Combo Prechopper (AE-4190)**
The angular side blade is sharp, the rounded side blunt

**Karate Prechop**

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

**Karate Prechop**

**When the whole blade is inserted into the nucleus, open the blades slowly while continue to push the blades down**

**Karate Prechop**

**When the complete nuclear division has been attained, the inner surface of the posterior capsule can be observed**
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**Karate Prechop**
Place the closed blades into the distal end of the nucleus

**Karate Prechop**
Open the blades to separate the distal end of the nucleus

**Karate Prechop**
Place the blades into the proximal end of the nucleus

**Karate Prechop**
Open the blades to separate the proximal end of the nucleus. Thus attain complete division from proximal to the distal end
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

Restore each bisected nuclear fragment into its original position and rotate the nucleus 90 degrees to prechop into four pieces.
Karate Prechop
When the whole blade is inserted into the nucleus, open the blades slowly while continuing to push 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.

For Soft Cataract

Counter Prechop
Phaco Prechop with Nuclear Support
- Hard Nucleus
- Incomplete CCC
- Weak Zonules

Universal Prechopper
Counter Prechop
Universal Prechopper (AE-4192) + Nucleus Sustainer (AE-2530)

Counter Prechop
Make a complete capsulorhexis smaller than the IOL optic size

Counter Prechop
Nucleus sustainer is carefully introduced to the equator of the nucleus. It is important to support the nucleus at deep point.

Counter Prechop
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.
Counter Prechop
Bring two instruments closer. By supporting the nucleus, open the blades repeatedly.

Counter Prechop
Using the two instruments, separate the posterior plate of the nucleus completely.

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

Counter Prechop
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

Insert the closed blade into the hardest core of the distal nuclear fragment by supporting with the nucleus sustainer
Bisect the distal half of the nucleus completely by repeating the opening action.

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

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.

As the U/S time is very short, the incision can be self-sealed quite easily without hydrating the corneal stroma.
Counter Prechop

For Dense Cataract

Phaco of Prechopped Nucleus

Bevel Down Burst Phaco

Summary

Nuclear Support

Karate Prechop
- Combo Prechopper

Nuclear Support

Counter Prechop
- Universal Prechopper
- Nucleus Sustainer

Key Point

Complete Separation

Merely making a crack into the nucleus is not enough. What is important is to attain complete division.
Manual Phaco Prechop

Merit of Manual Prechop
- Applicable to any cases
- No energy
- Complete division
- High cost-performance

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

Demerit of Manual Prechop
- Learning curve

Start from Karate!

Normal Case
**Challenging Case**

Deep set Eye, Shallow AC post LI, Small Pupil, Dense Nucleus, Weak Zonule
PACG with Advanced Visual Field Defect, Poor old lady living alone with single eye

**Possible Issues of Ultrasound Prechop**
- U/S energy
- Posterior plate management

**Possible Issues of Laser Prechop**
- Limited indication
- Posterior plate management
- Cost
- Efficiency

**Phaco Prechop**

**Hand**
Old and universal technique. But it requires skills and experience.

**Ultrasound**
No doubt that Ultrachopper is a great tool for a dense cataract. Need to manage the posterior plate by hand.

**Laser**
The safest and easiest way of prechop. Limited indication. Need to manage the posterior plate by hand. Possible issue of cost/performance.
Thank you for your attention!

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