



DMEK ROLL:

ORIENTATION & UNFOLDING TECHNIQUES

*ALEXANDRIA
OPHTHALMOLOGY SUMMIT, 2109*

*Tarek katamish
Cairo University*

DMEK

Descemets

Membrane

Endothelial

Keratoplasty

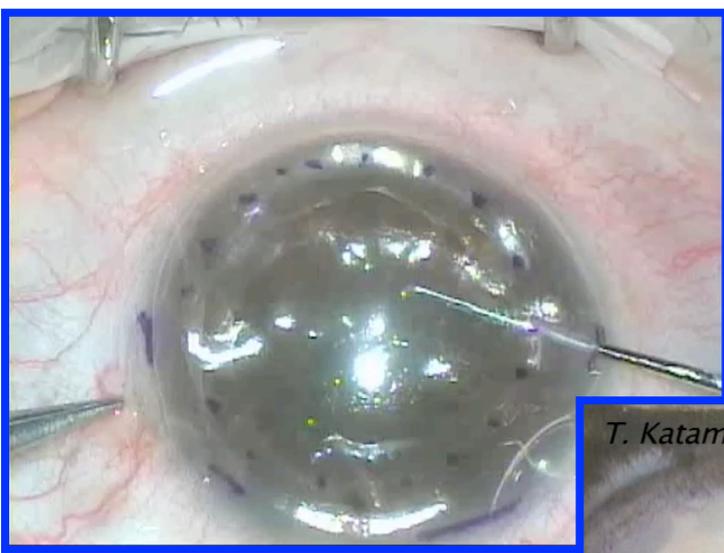
DMEK

Endothelial Keratoplasty

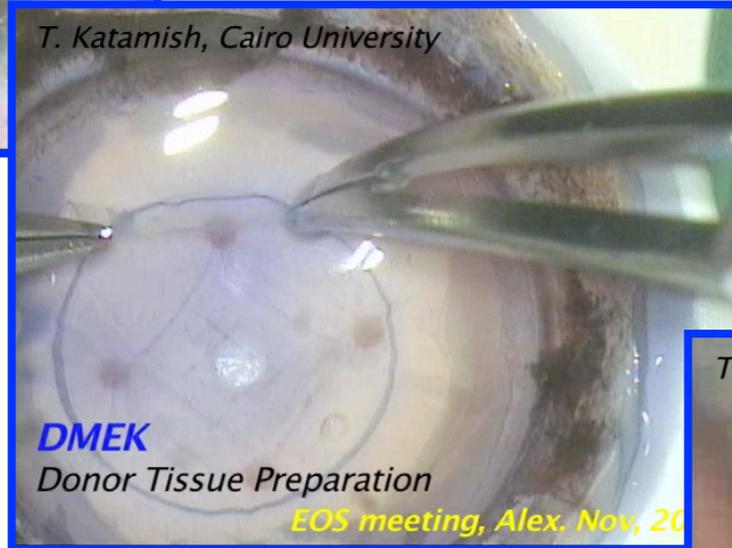
Endothelial Cell Failure

- 1- Post Phaco PBK**
- 2- Fuchs' ED**

DMEK



DM-Rhexis



Donor Tissue Prep.



Donor Tissue Loading



Donor Tissue Orientation & Unfolding

DMEK

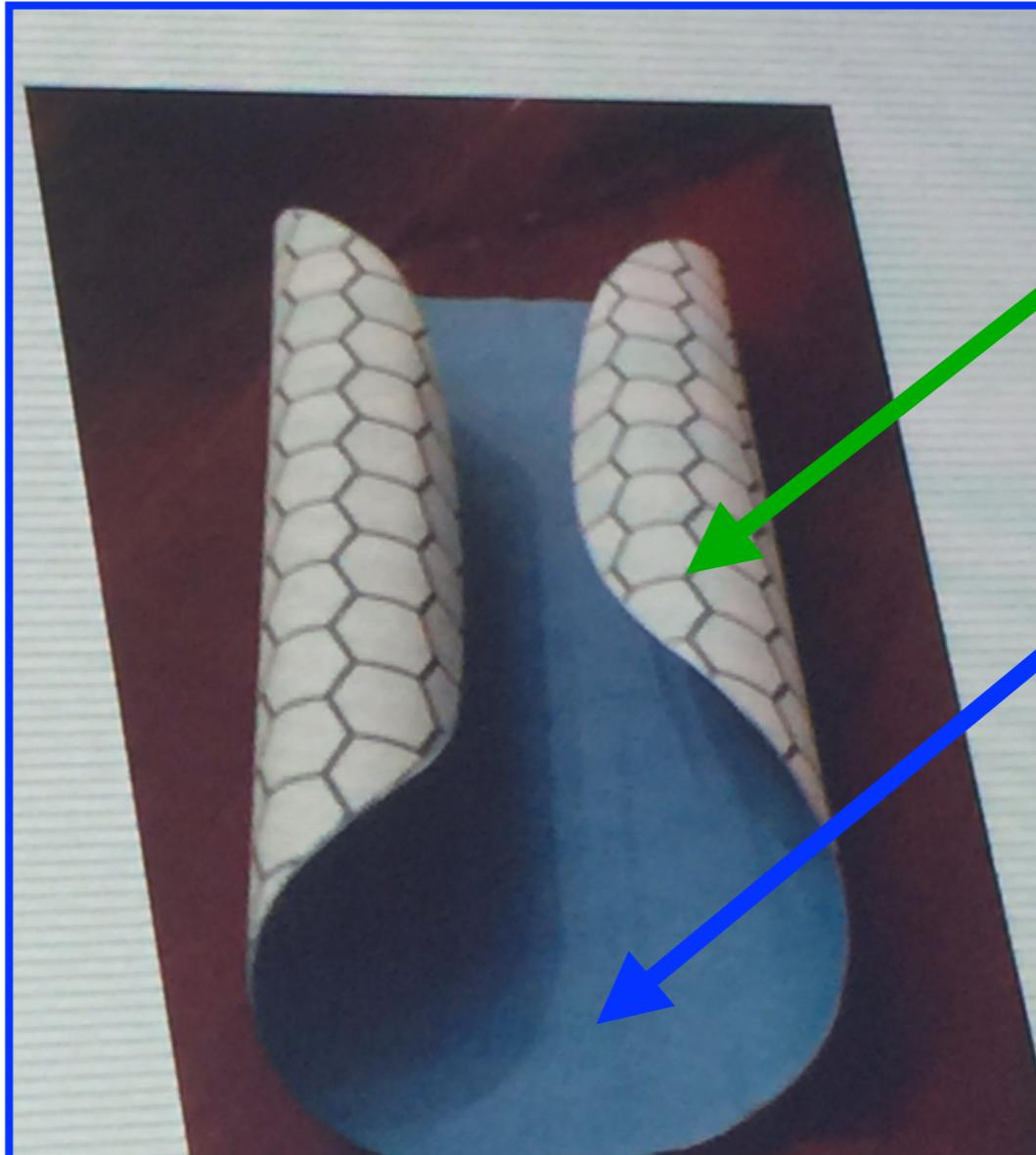
**UPSIDE
DOWN
GRAFT**



**PRIMARY
GRAFT
FAILURE**

NO WAY

Natural behavior of DMEK roll



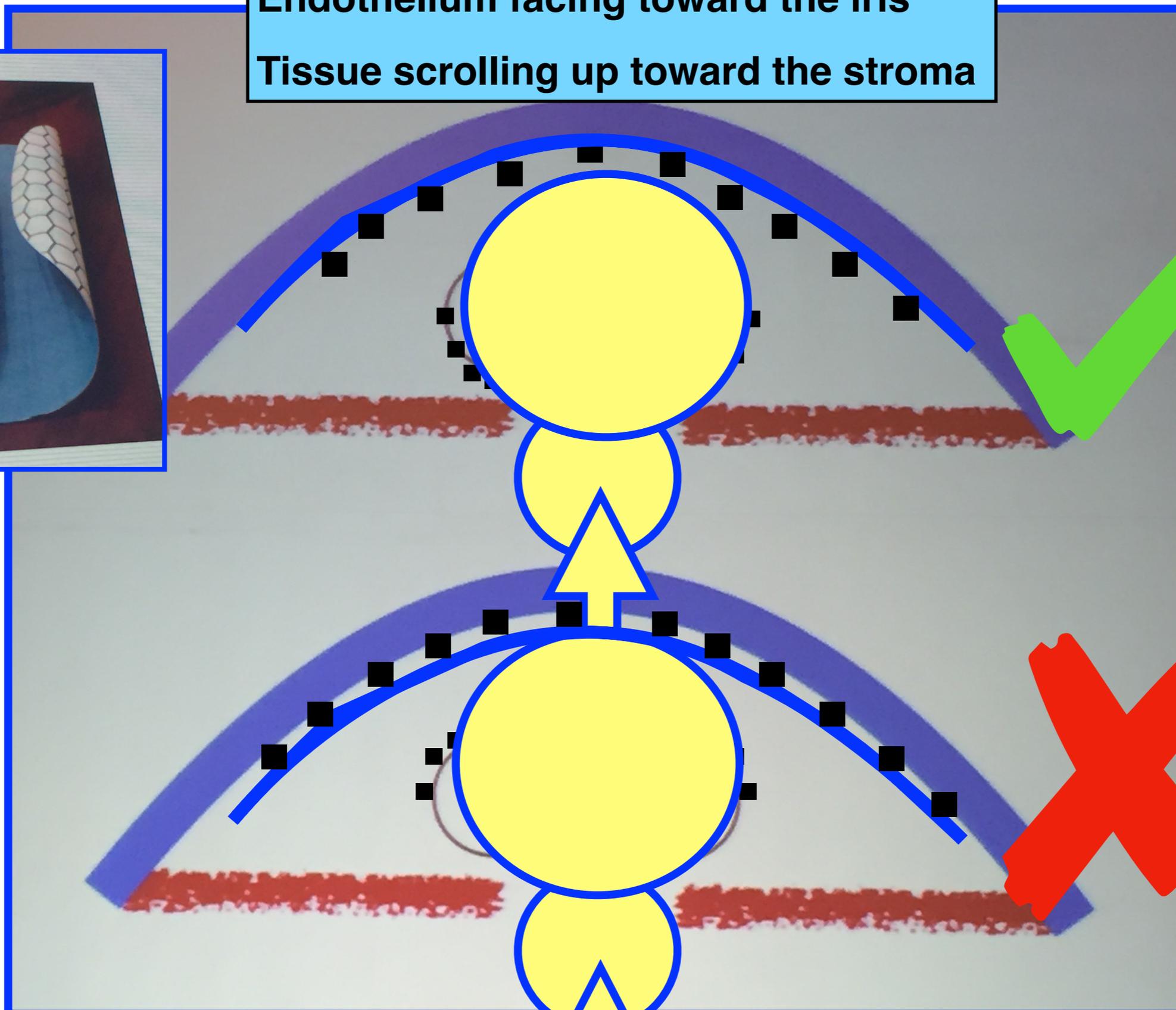
Endothelium
outside

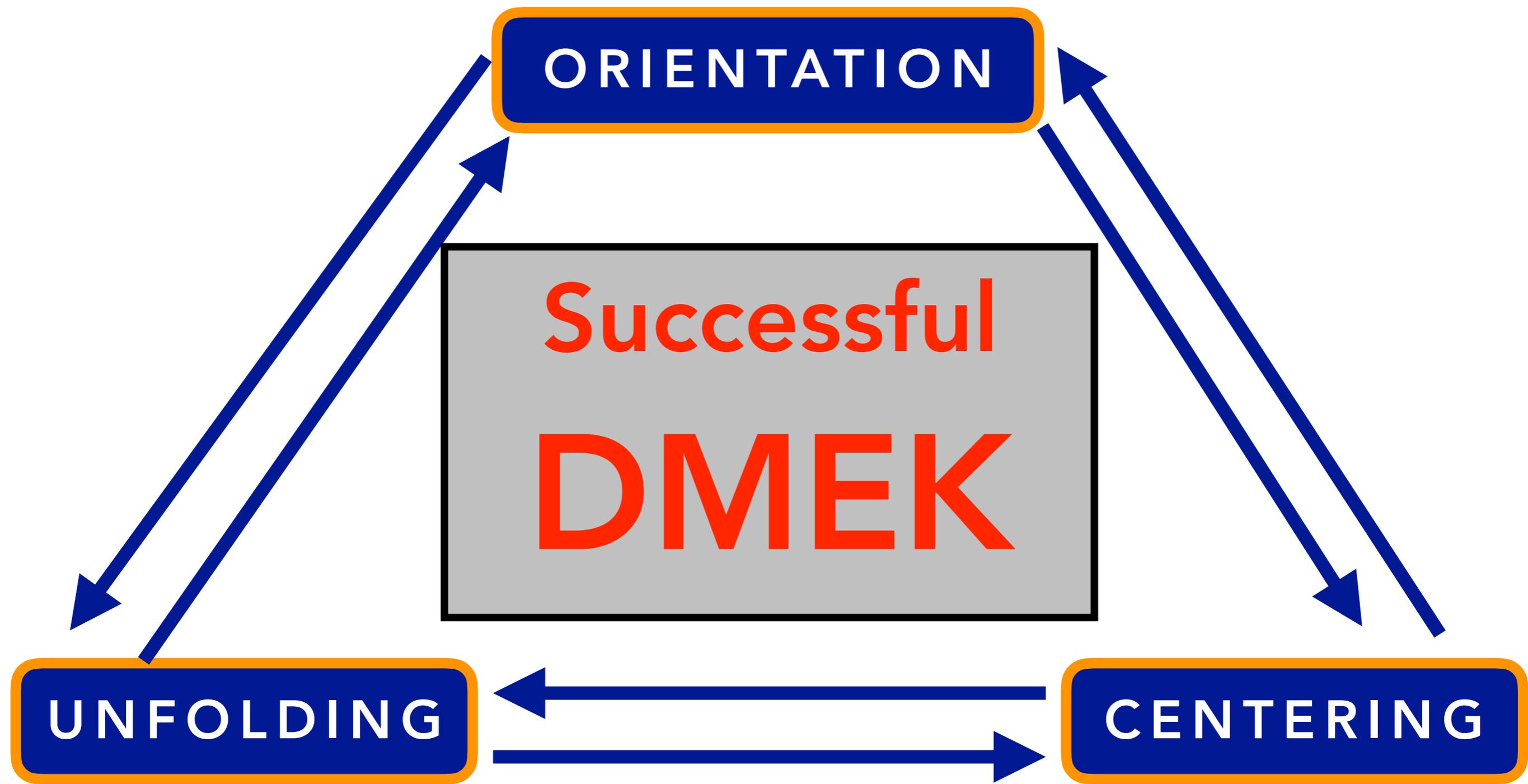
D.M. (elastic)
Inside

in 100% of cases

CORRECT DMEK GRAFT ORIENTATION

Endothelium facing toward the iris
Tissue scrolling up toward the stroma





HOW TO AVOID UPSIDE DOWN GRAFT

➤ Before injection of DMEK roll:

Proper orientation in cartridge.

➤ After injection of DMEK roll:

“Moutsouris sign”: Blue cannula sign

➤ During unfolding DMEK roll:

Intra-operative **AS-OCT**

➤ After fixing DMEK roll to stroma:

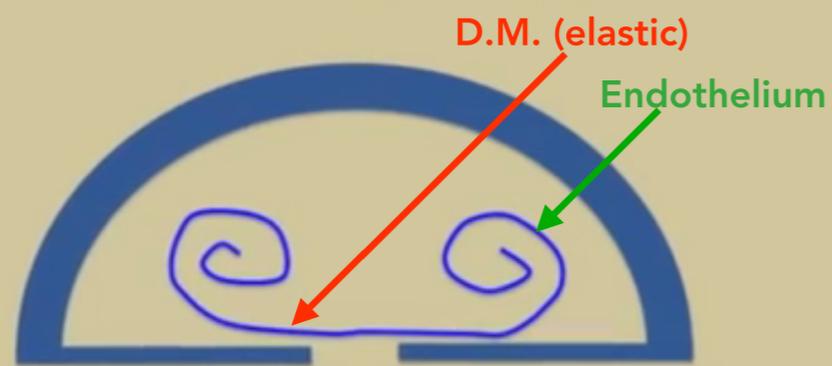
“S” Stromal stamp

HOW TO AVOID UPSIDE DOWN GRAFT

➤ **Before injection of DMEK roll:**

Proper orientation in cartridge.

CORRECT GRAFT ORIENTATION

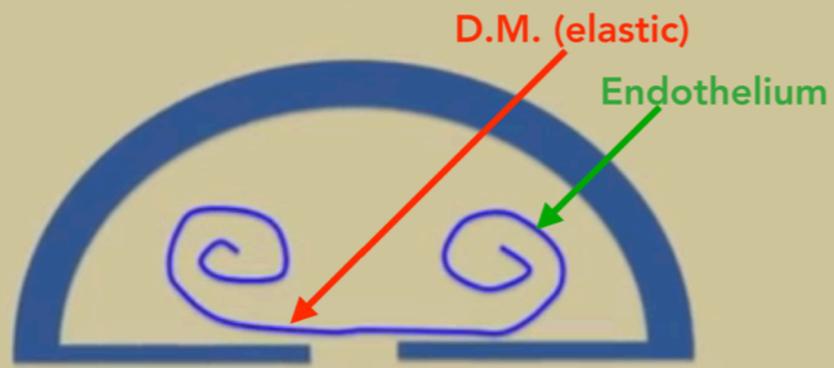


in **100%** of cases

DMEK ROLL ORIENTATION

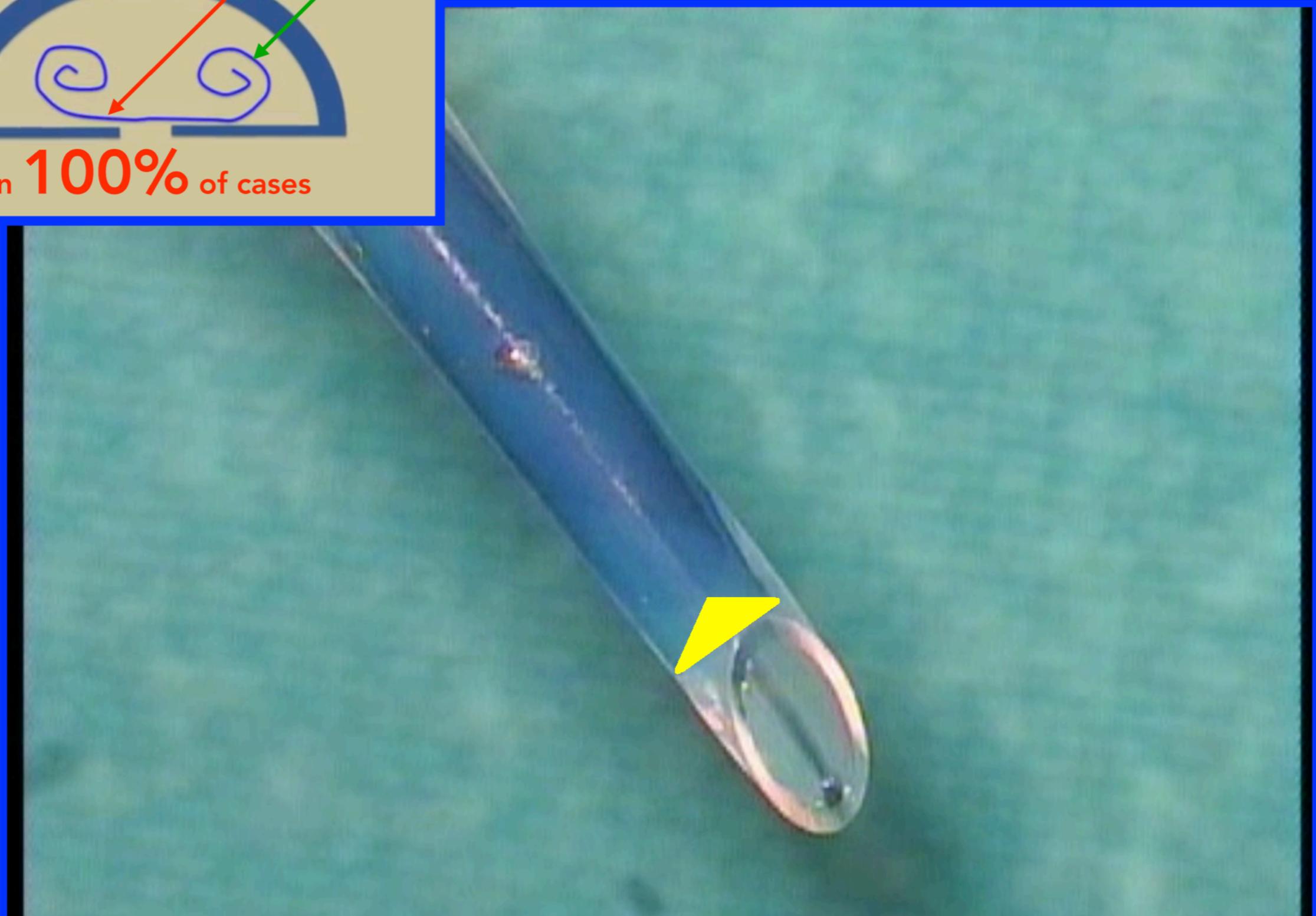


CORRECT GRAFT ORIENTATION



in **100%** of cases

DMEK ROLL ORIENTATION

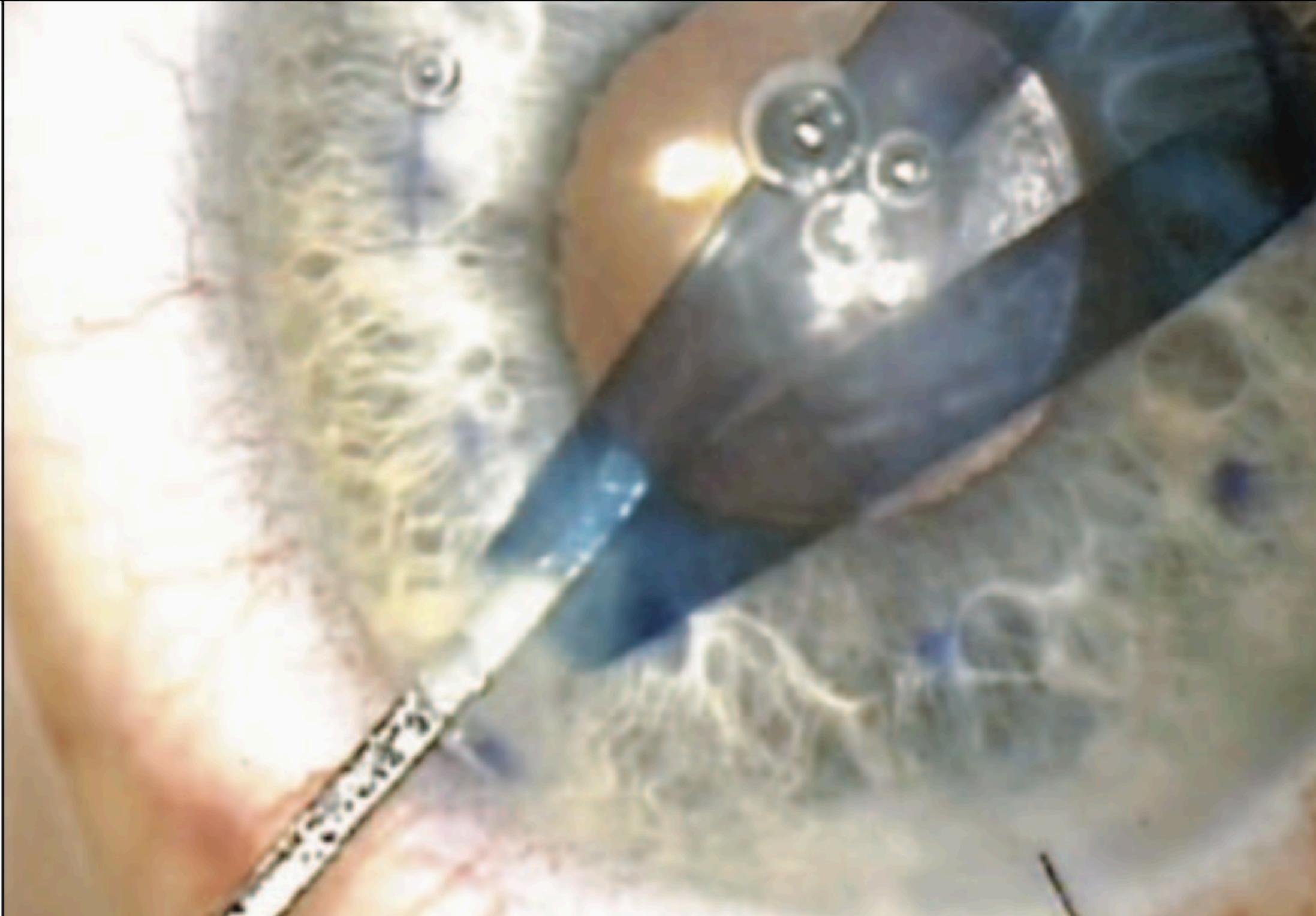


HOW TO AVOID UPSIDE DOWN GRAFT

➤ **After injection of DMEK roll:**

“Moutsouris sign”: Blue cannula sign

CHECKING GRAFT ORIENTATION "MOUTSOURIS SIGN"

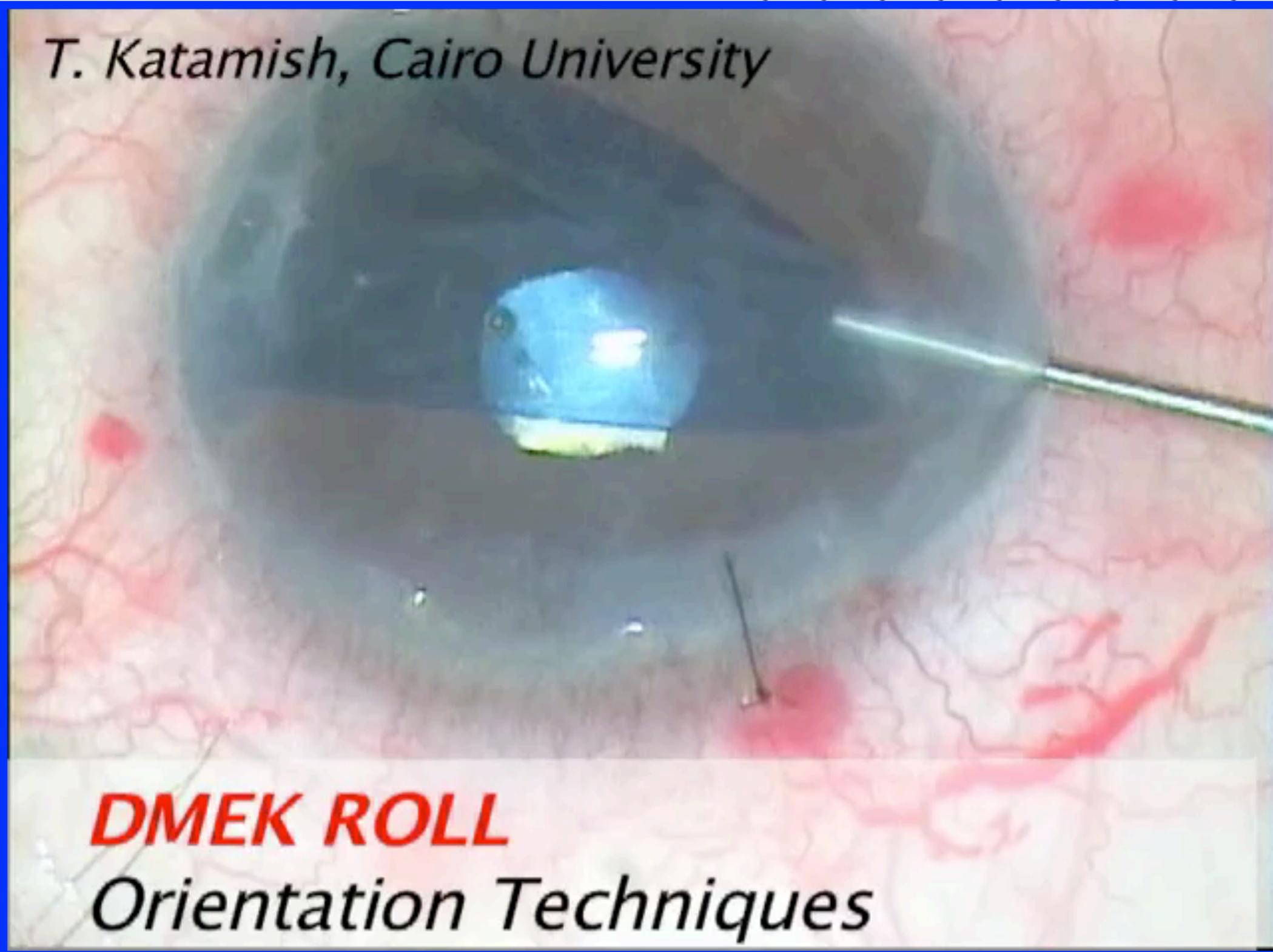


BLUE CANNULA TEST

“MOUTSOURIS SIGN”



T. Katamish, Cairo University



DMEK ROLL

Orientation Techniques

HOW TO AVOID UPSIDE DOWN GRAFT

➤ During unfolding of DMEK roll:

Intra-operative **AS-OCT**

INTRAOPEARTIVE AS-OCT

Tight DM scroll

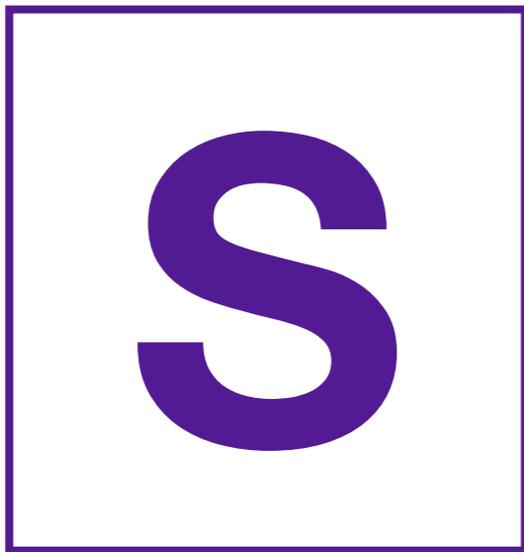
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HOW TO AVOID UPSIDE DOWN GRAFT

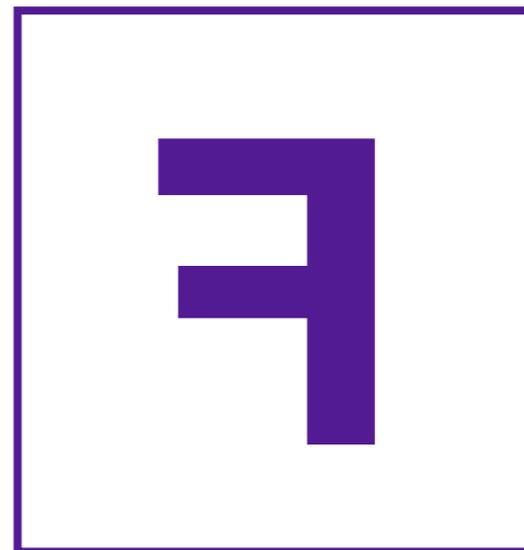
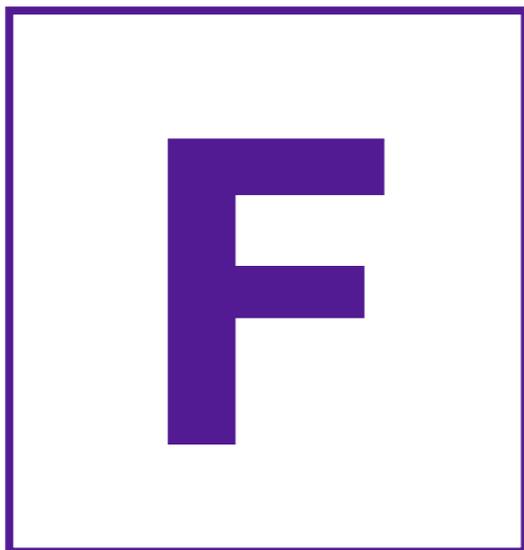
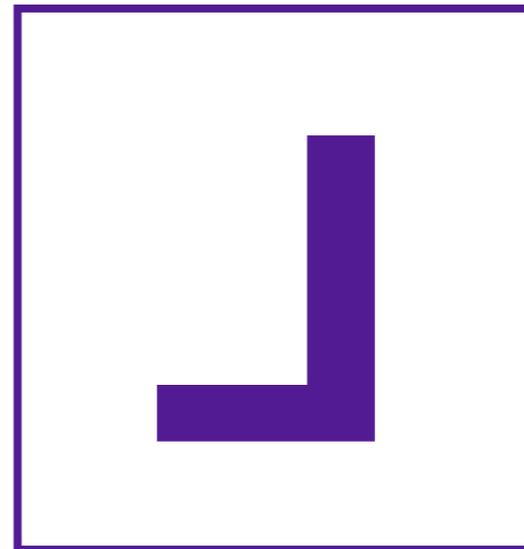
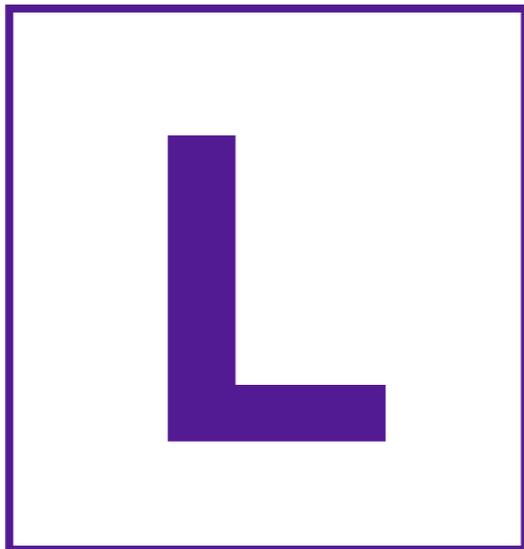
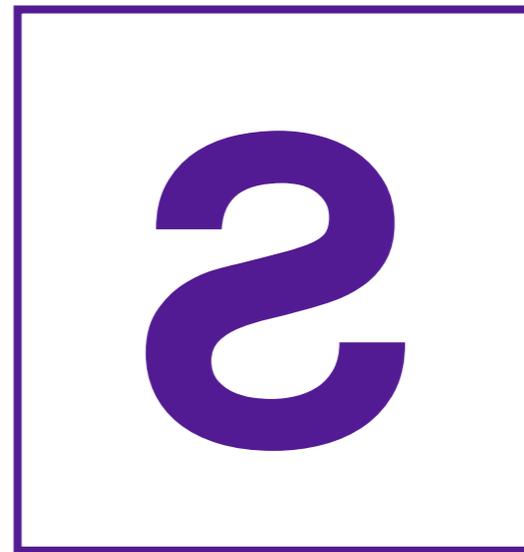
➤ After fixing DMEK roll to stroma:

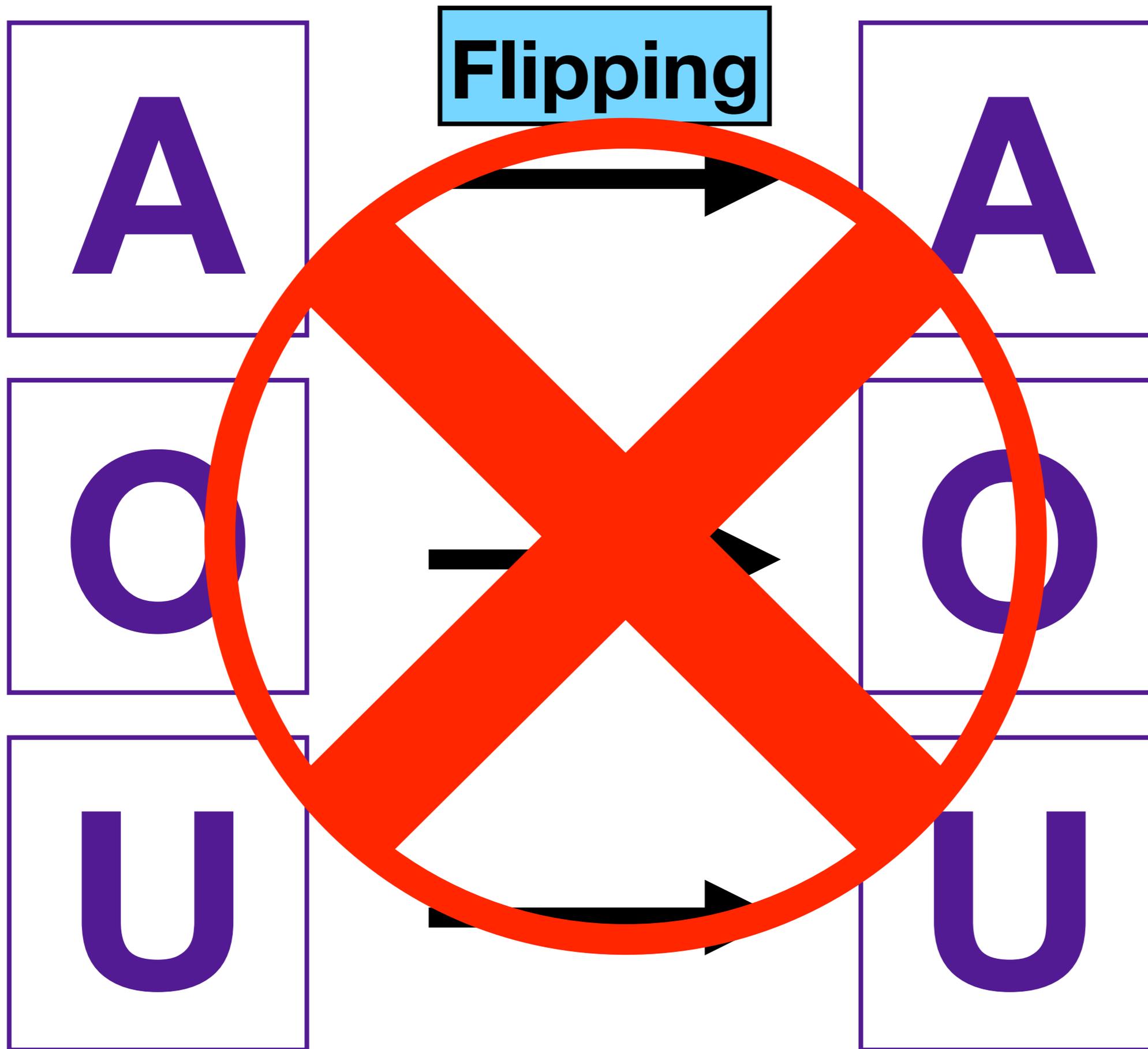
“S” Stromal stamp





Flipping

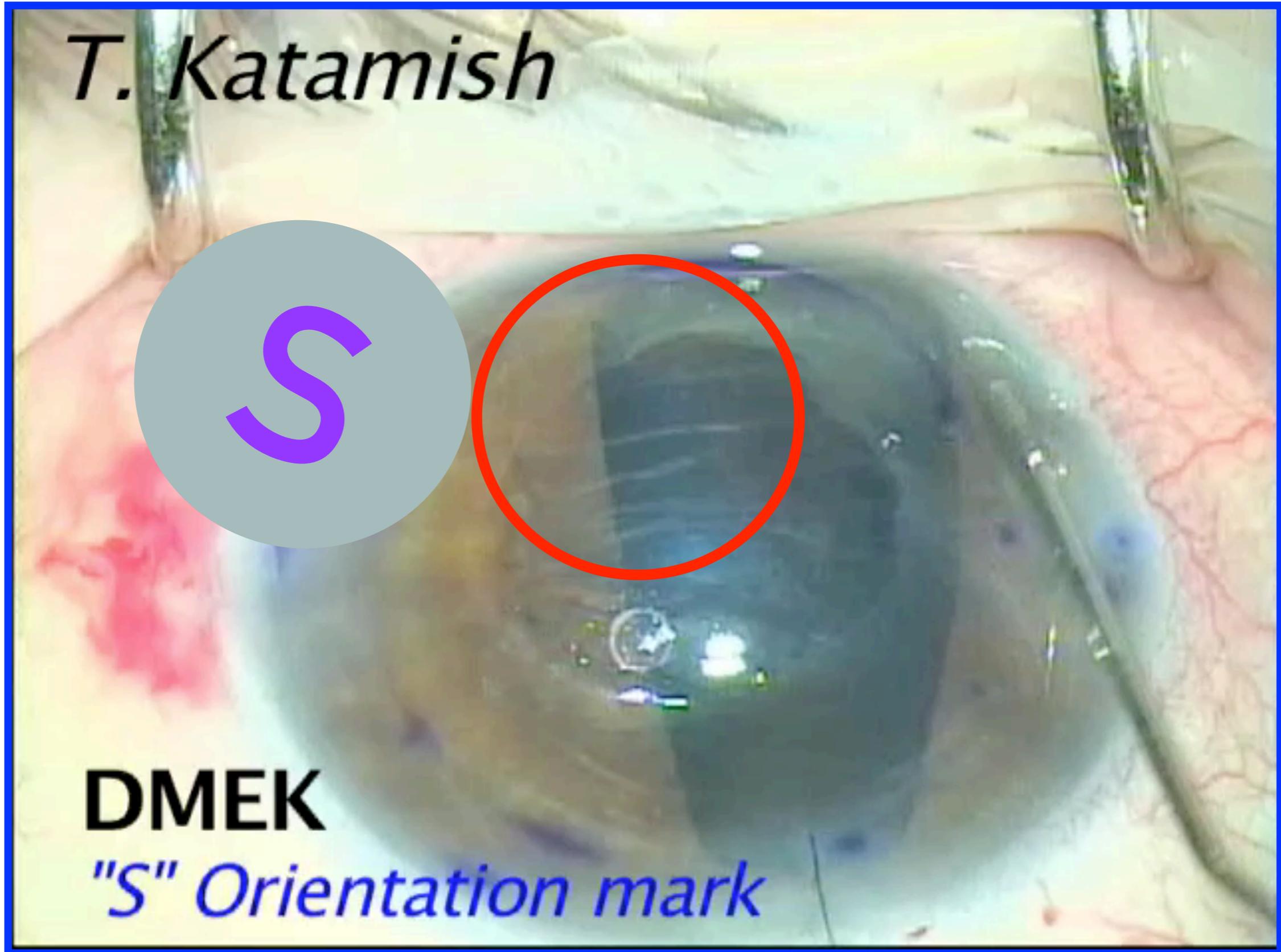




“S” ORIENTATION MARK, **HOW TO DO IT?**

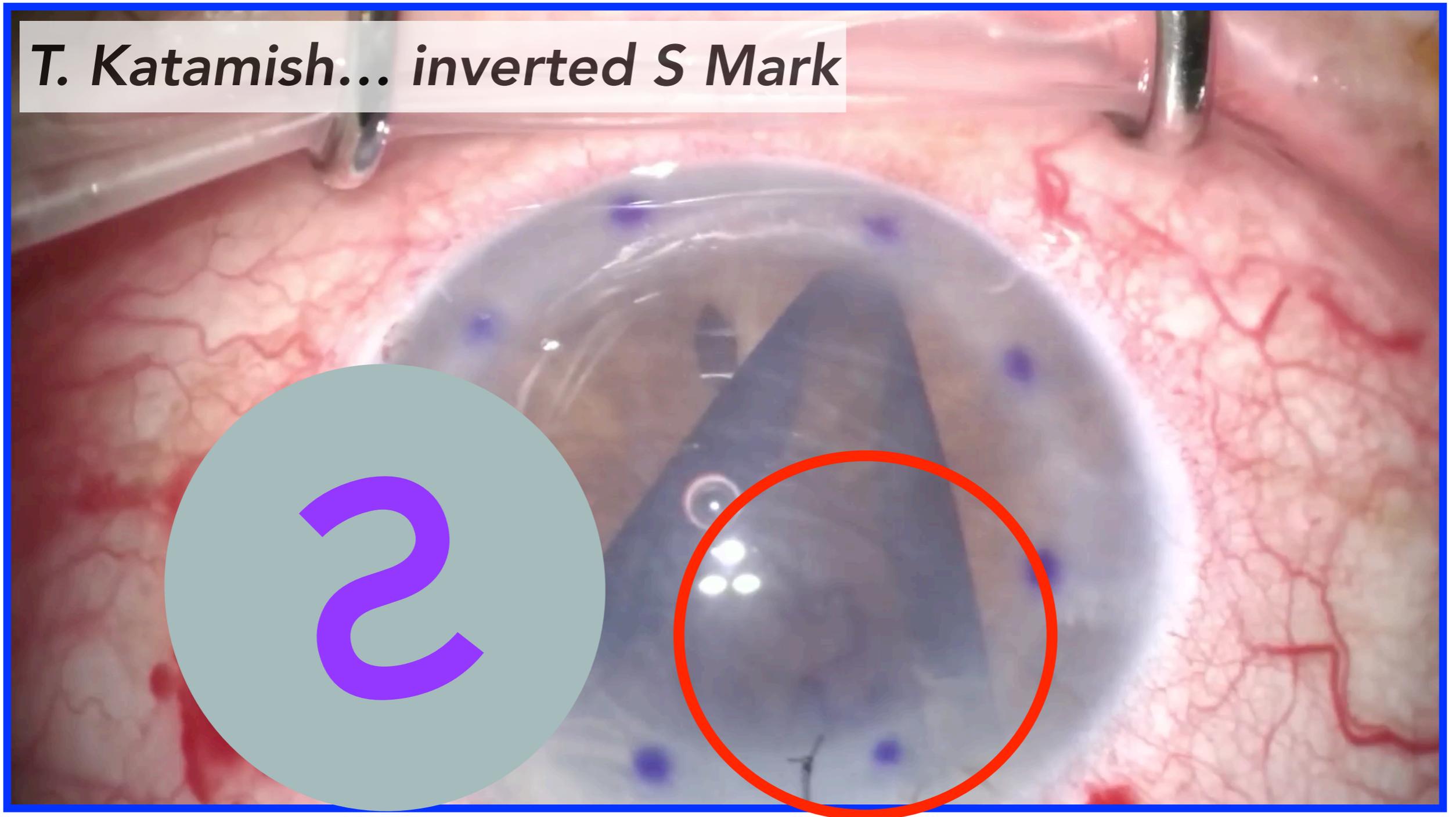


"S" ORIENTATION MARK



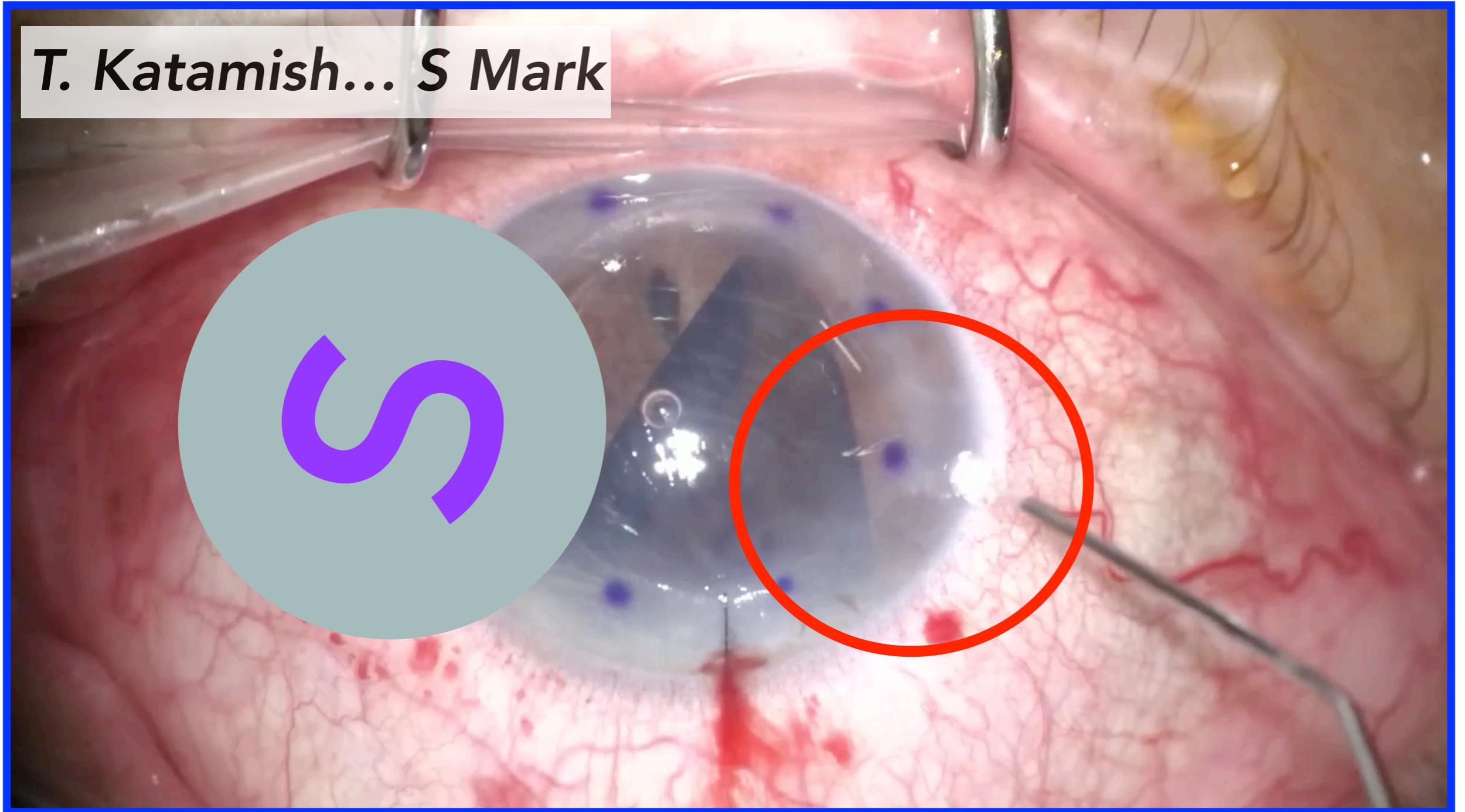
“S” ORIENTATION MARK, UPSIDE DOWN GRAFT

T. Katamish... inverted S Mark



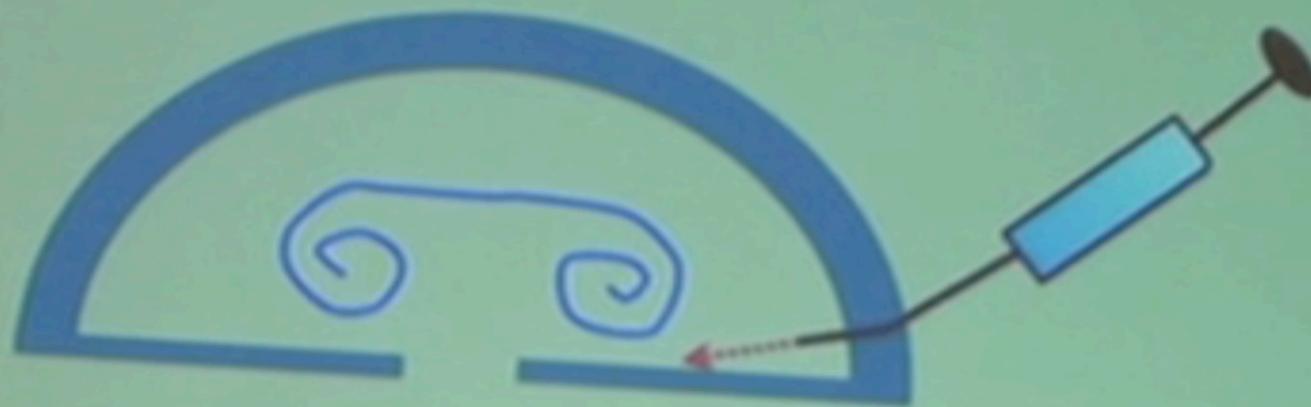
"S" ORIENTATION MARK

T. Katamish... S Mark



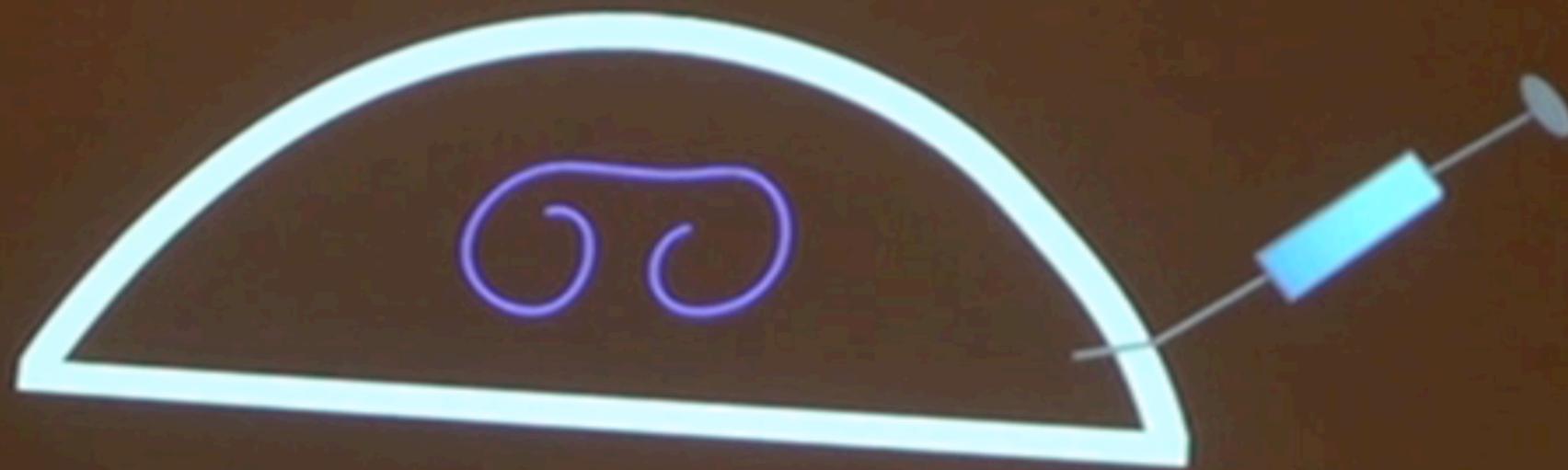
Rolling over an inverted graft:

Direct short bursts of BSS along the iris plane or along the arc of the cornea to roll the graft.

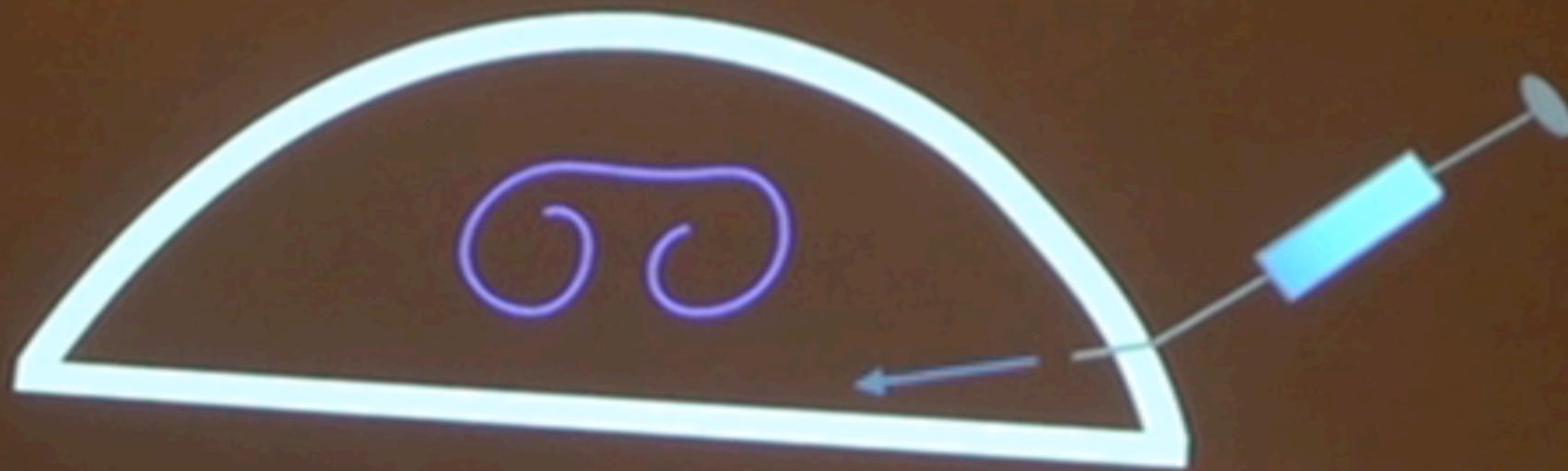


MIKE STRAIKO, MD
DEVERS EYE INSTITUTE

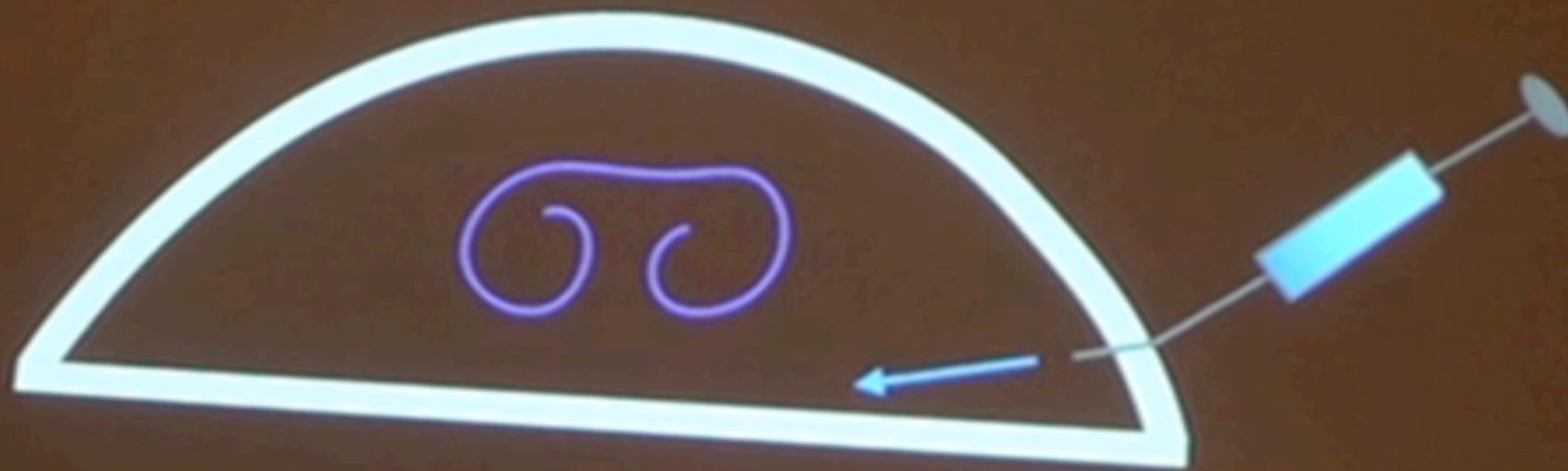
Graft Rollover
aim along iris or corneal plane



Graft Rollover
aim along iris or corneal plane

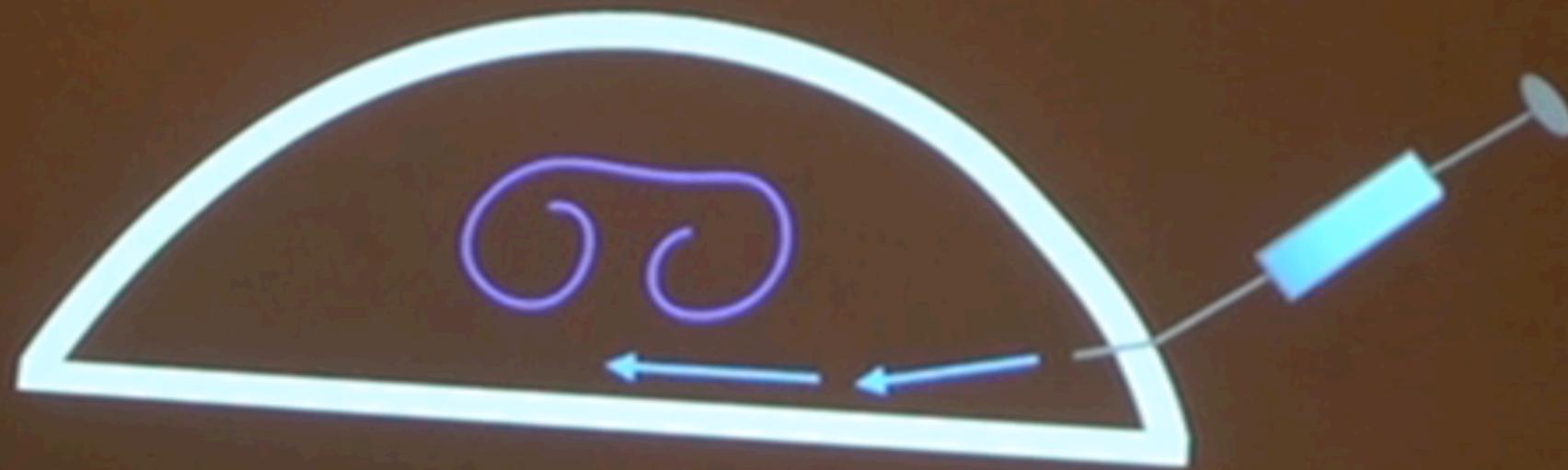


Graft Rollover
aim along iris or corneal plane

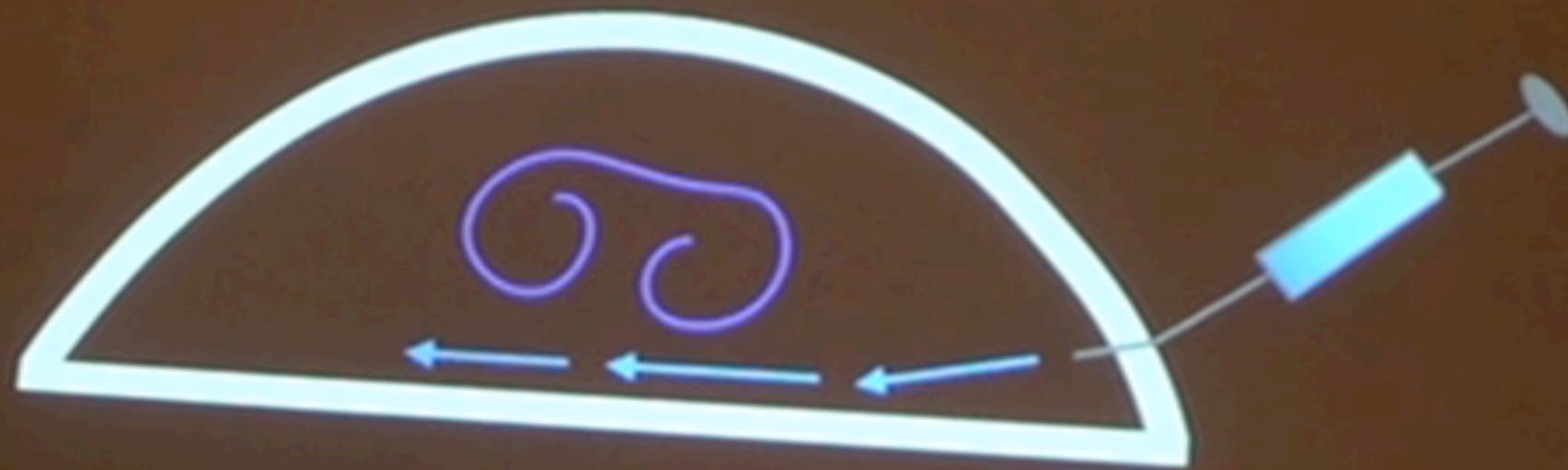


Graft Rollover

aim along iris or corneal plane

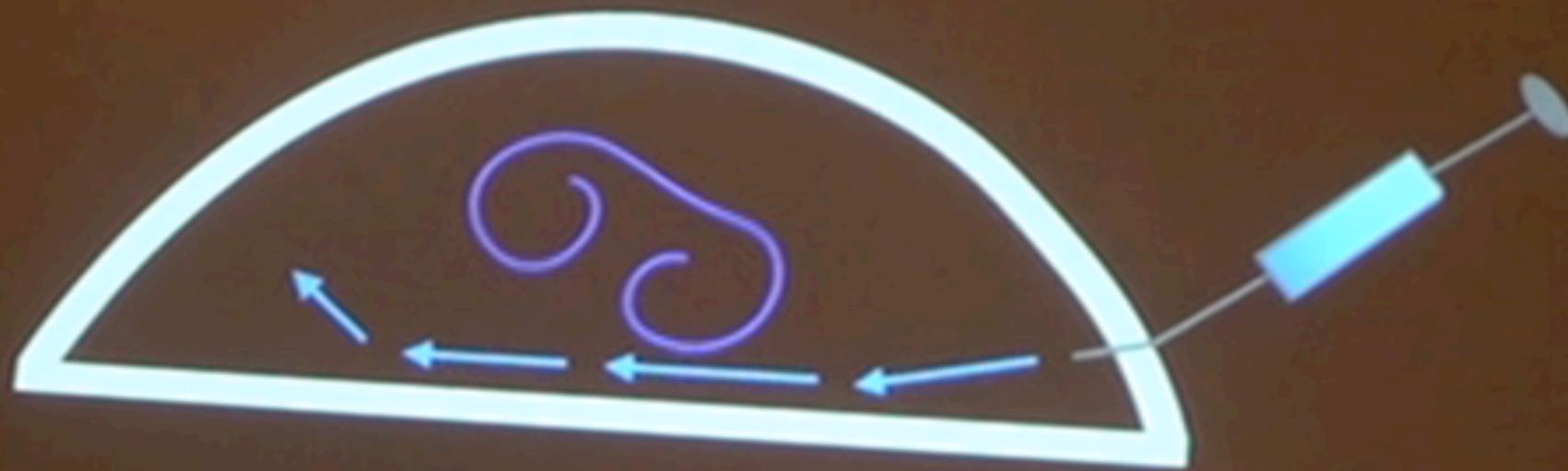


Graft Rollover
aim along iris or corneal plane



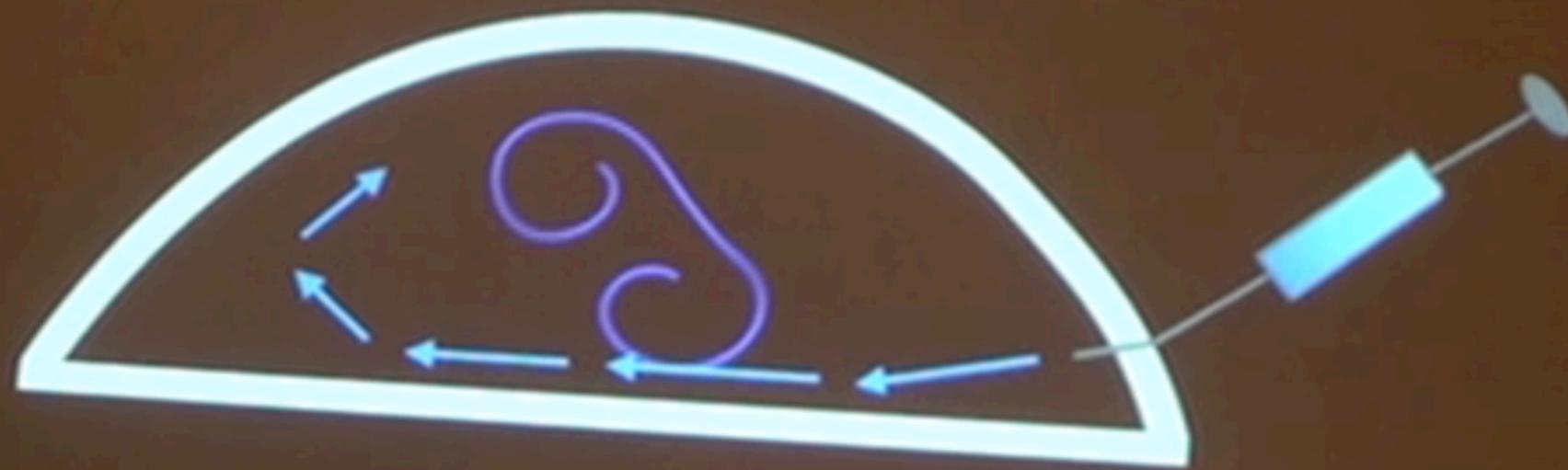
Graft Rollover

aim along iris or corneal plane



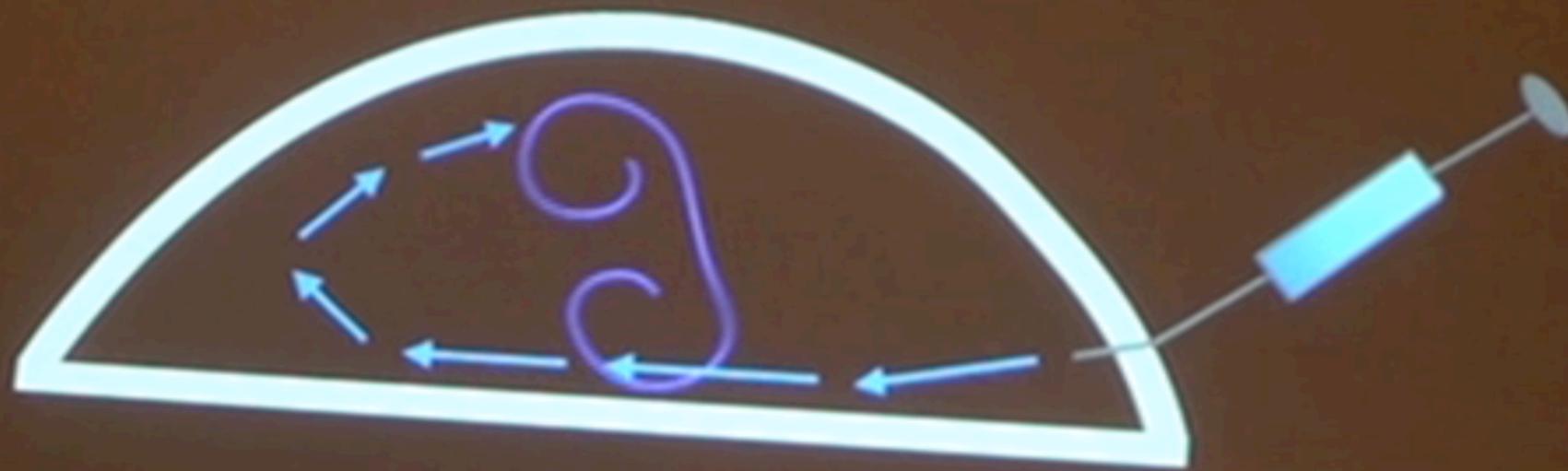
Graft Rollover

aim along iris or corneal plane



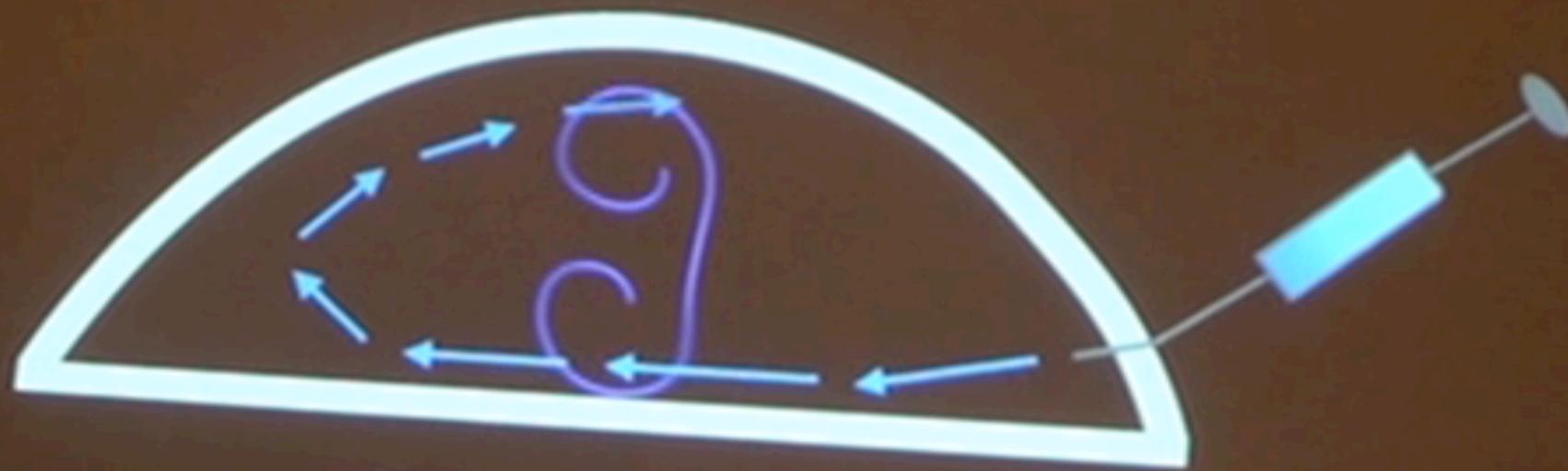
Graft Rollover

aim along iris or corneal plane

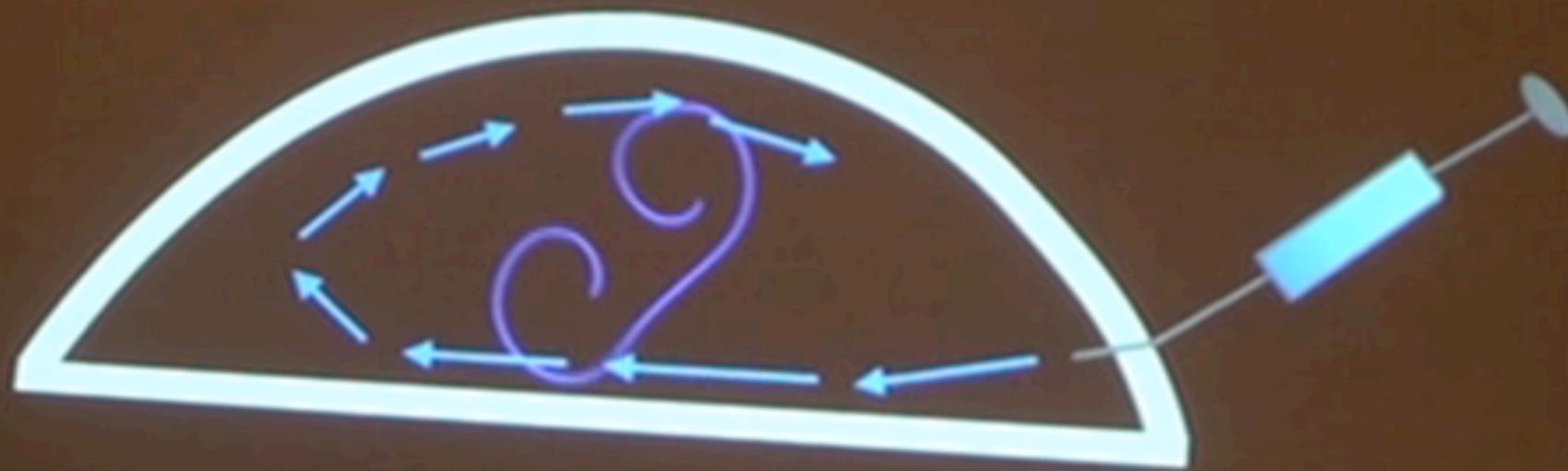


Graft Rollover

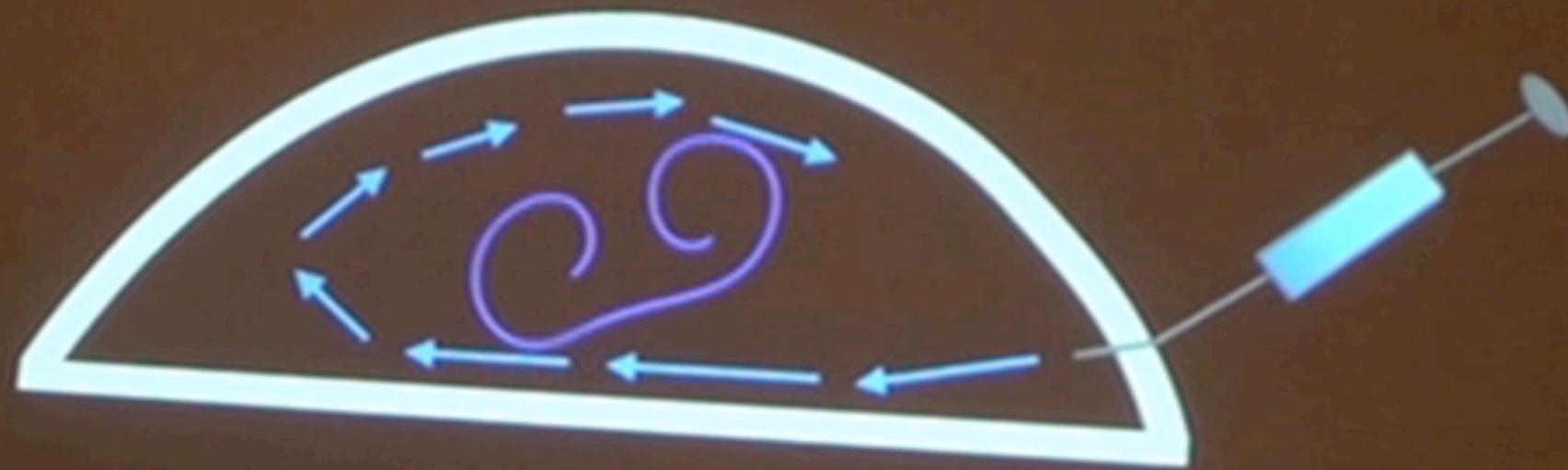
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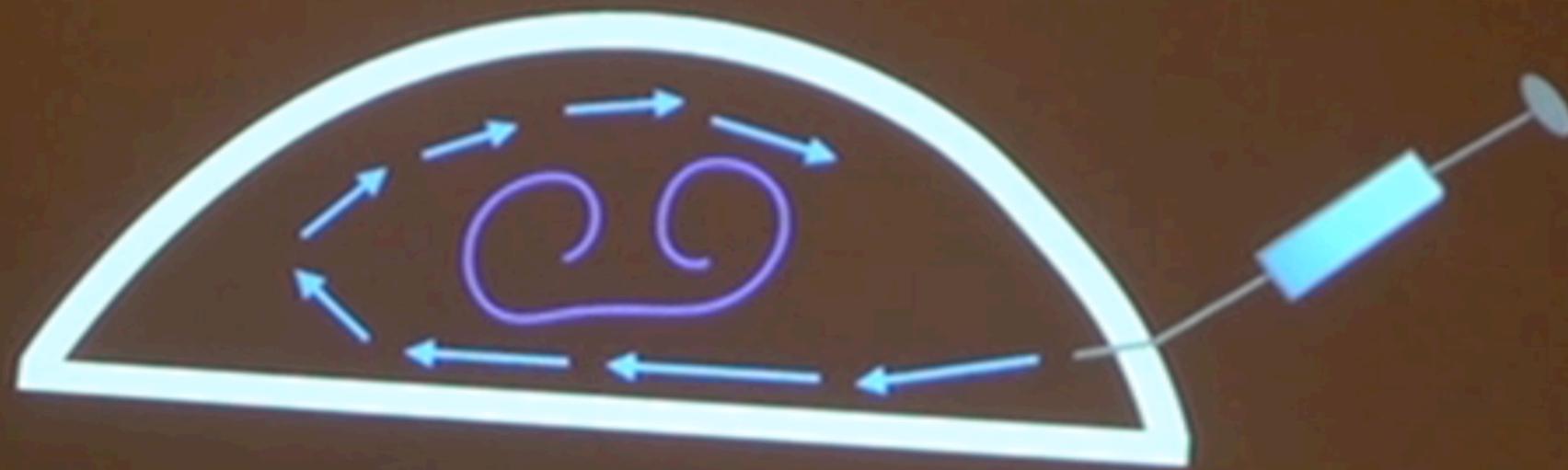


Graft Rollover
aim along iris or corneal plane



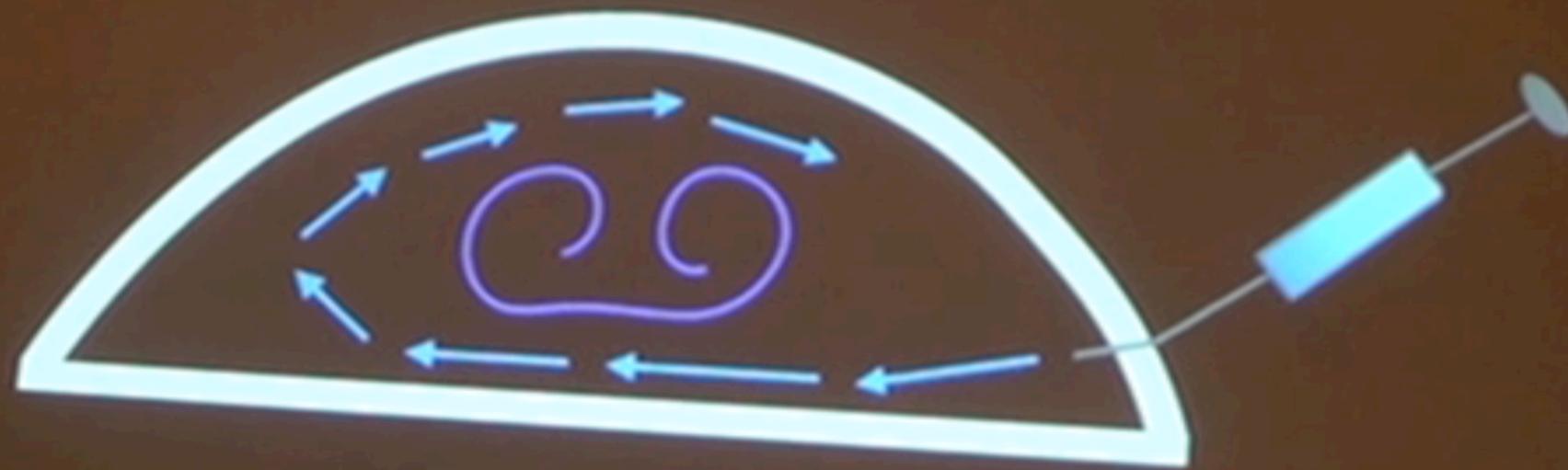
Graft Rollover

aim along iris or corneal plane



Graft Rollover

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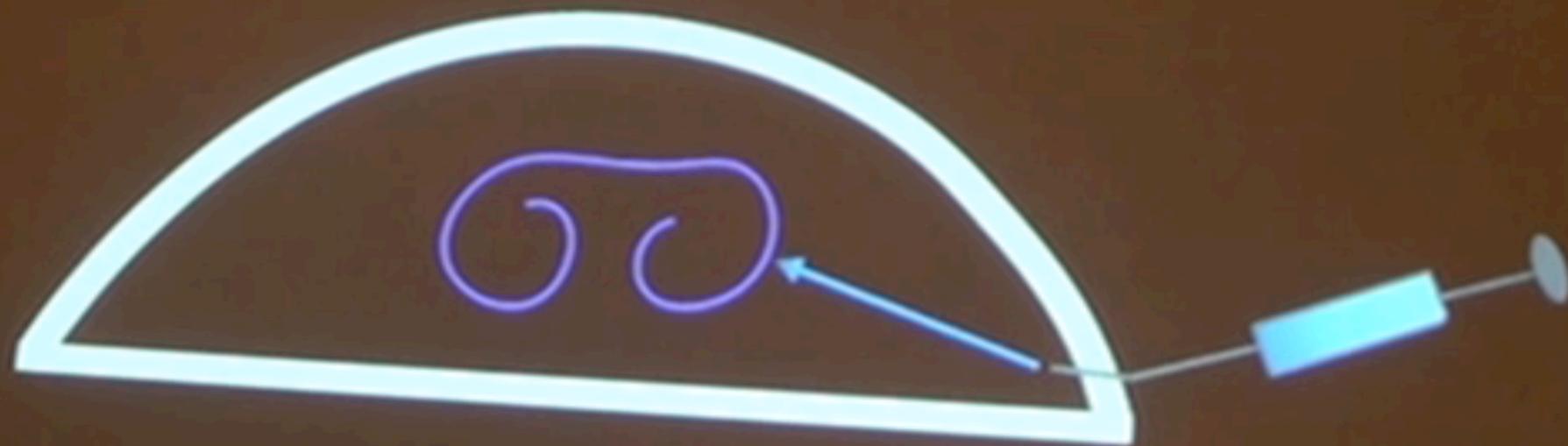
Graft Rollover

Aim along iris or corneal plane



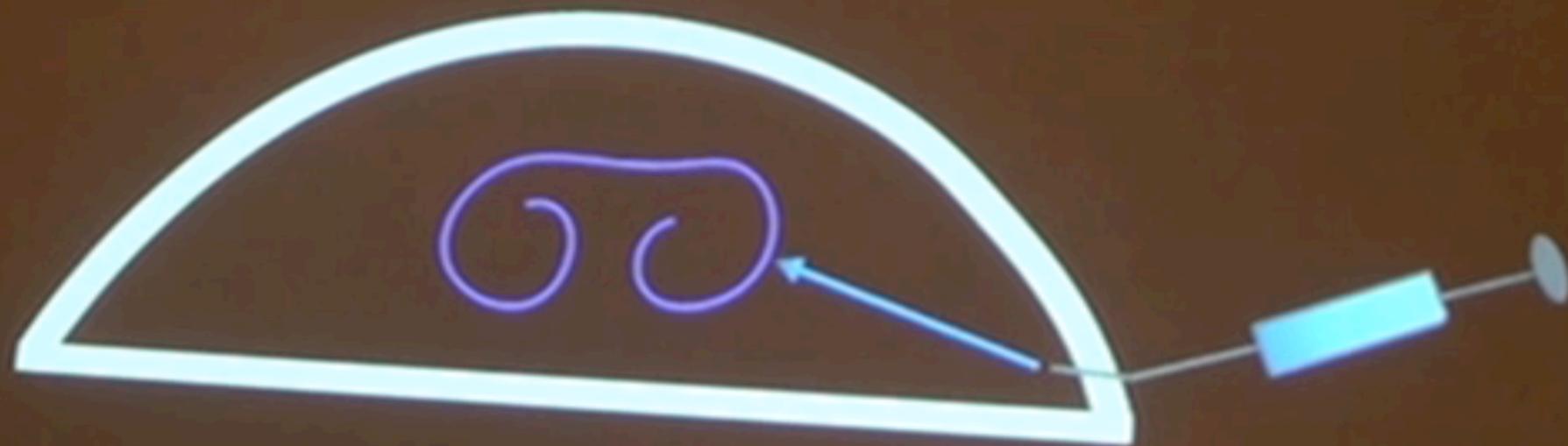
Graft Rollover

Aim along iris or corneal plane



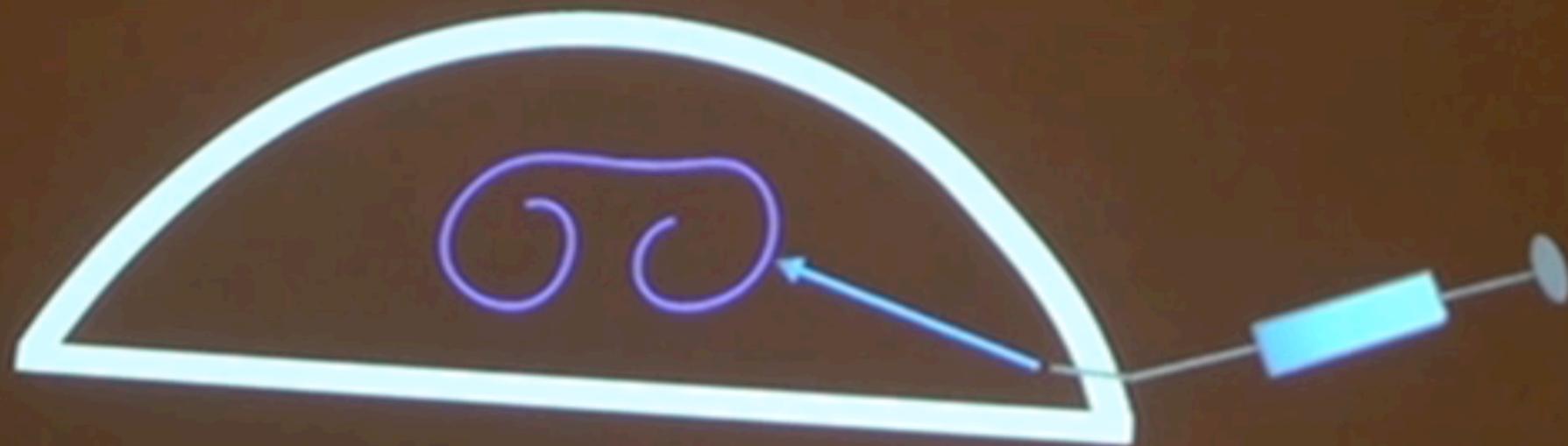
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Aim along iris or corneal plane



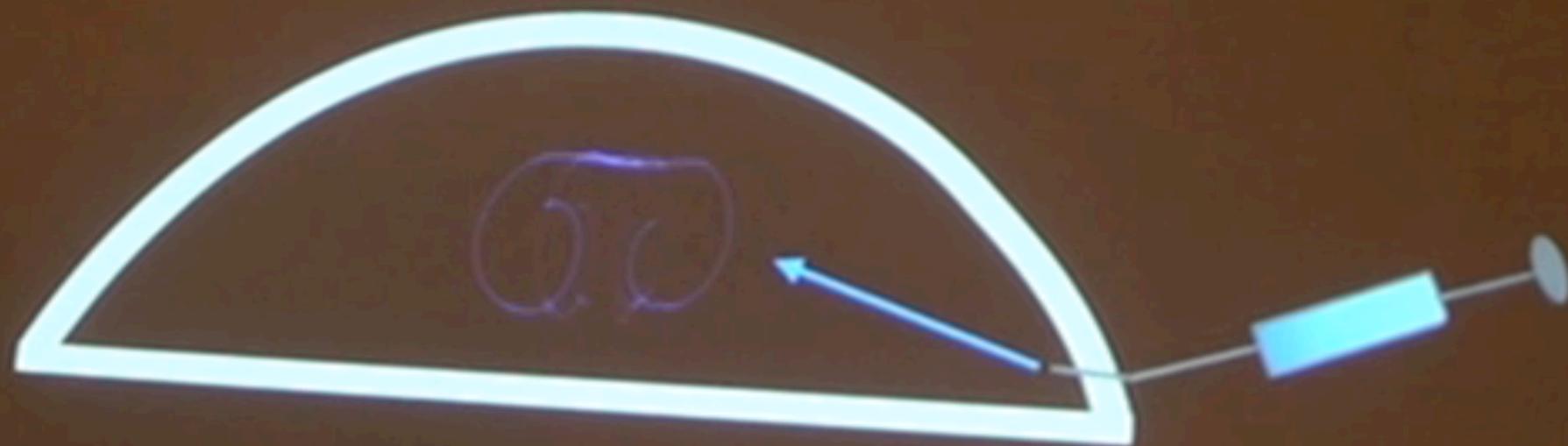
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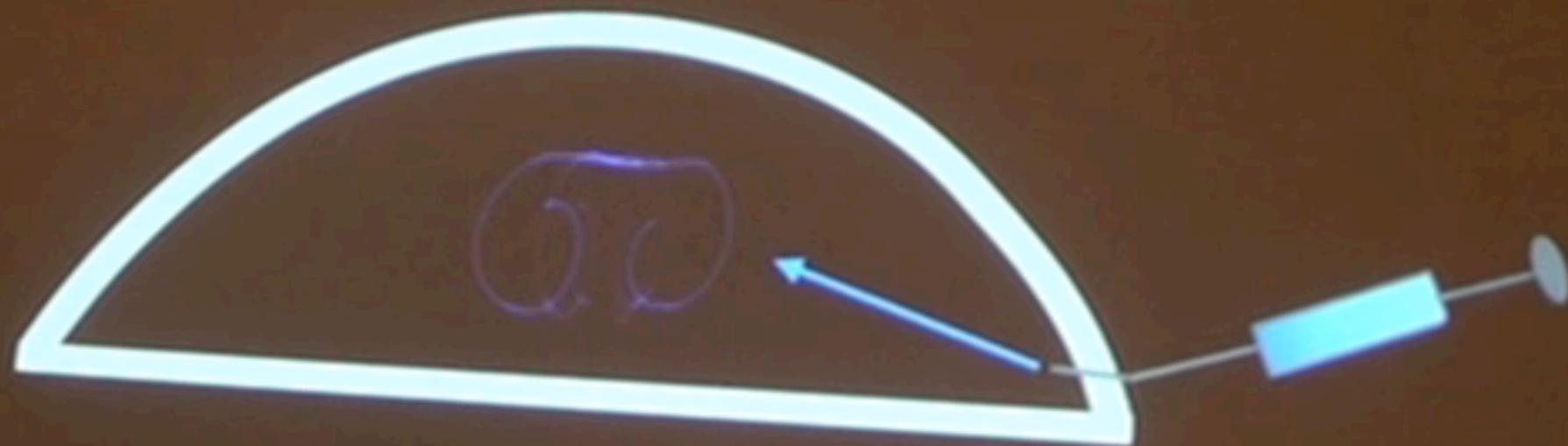
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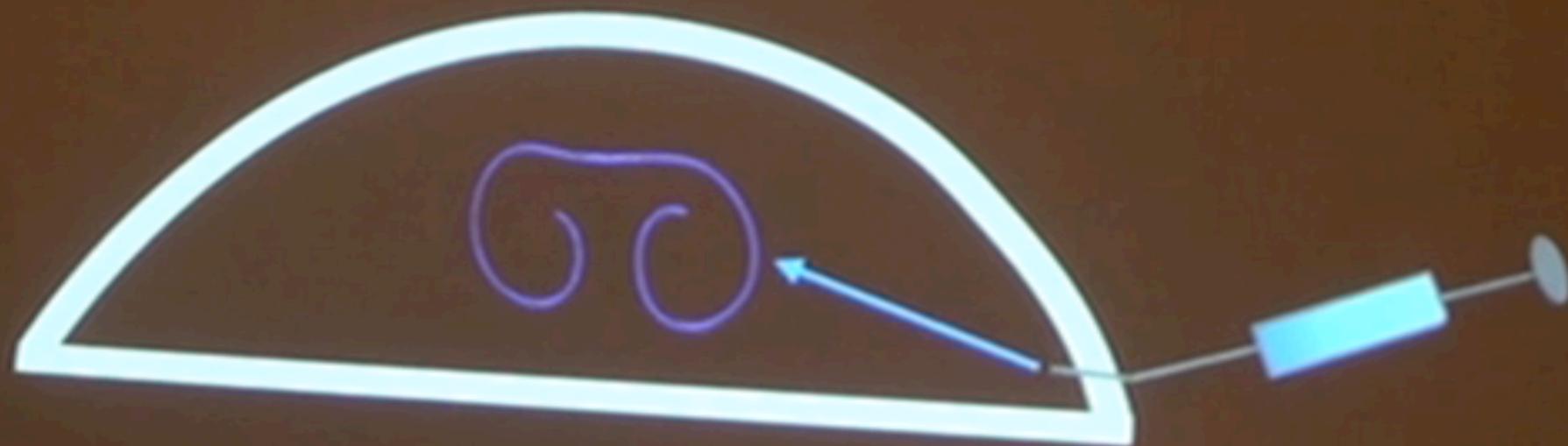
Graft Rollover

Aim along iris or corneal plane



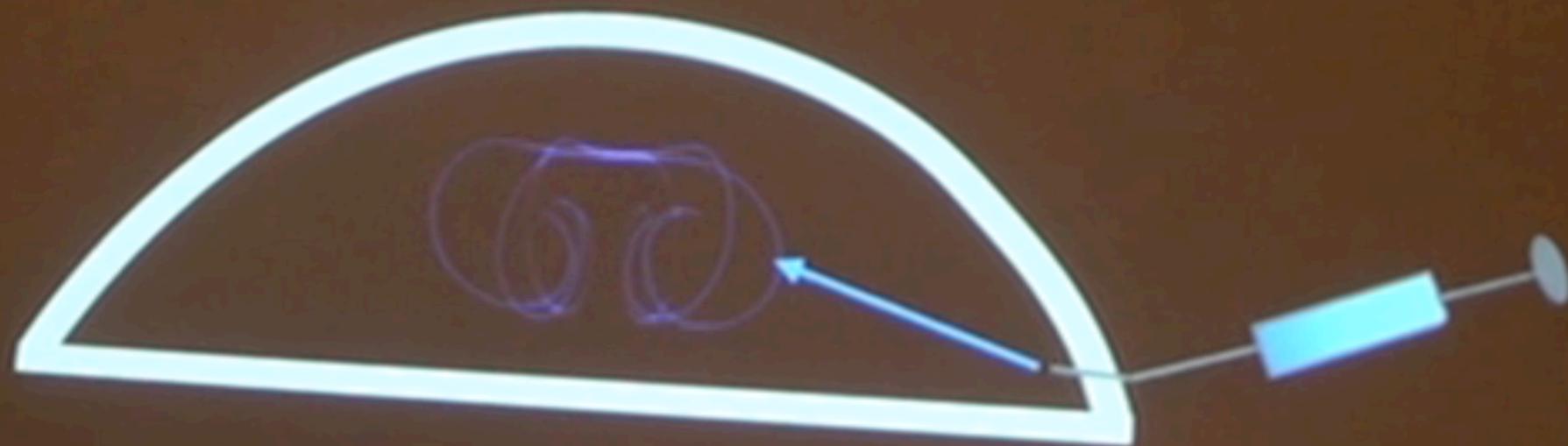
Graft Rollover

Aim along iris or corneal plane



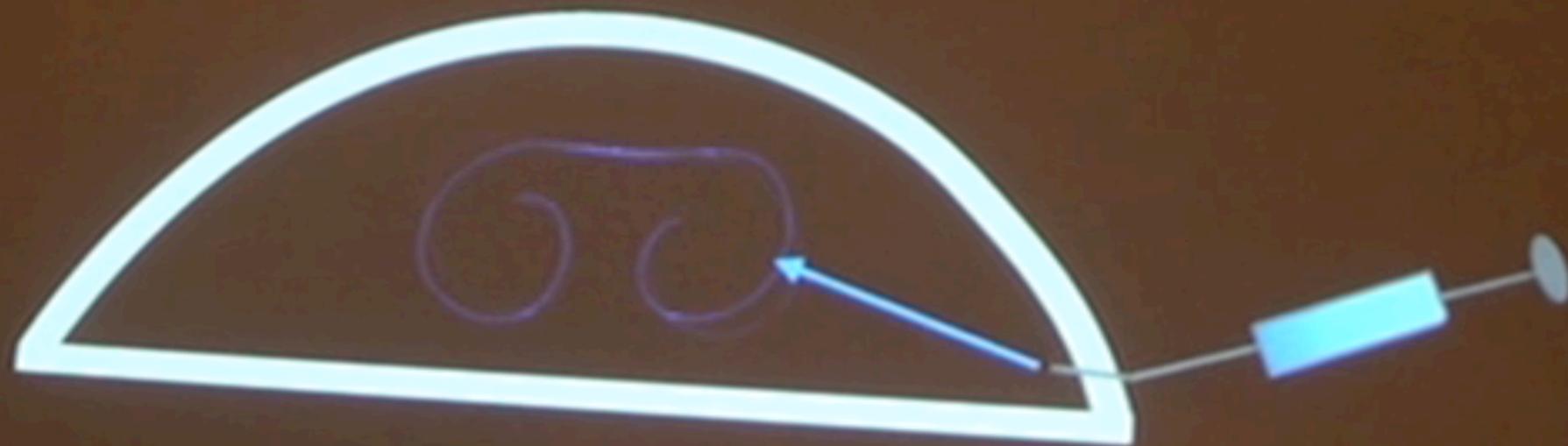
Graft Rollover

Aim along iris or corneal plane



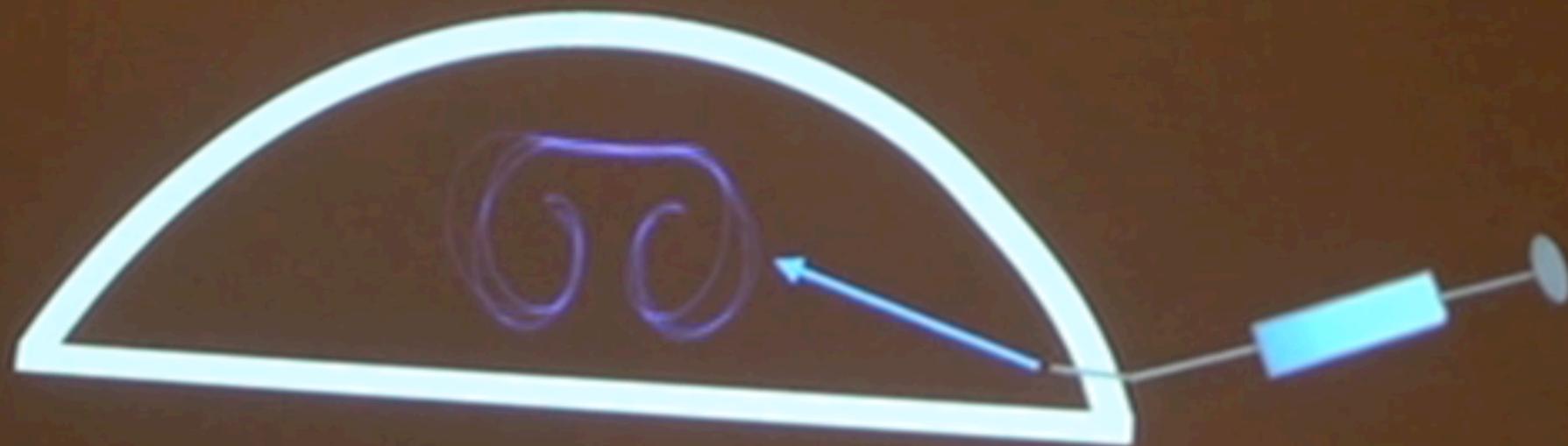
Graft Rollover

Aim along iris or corneal plane



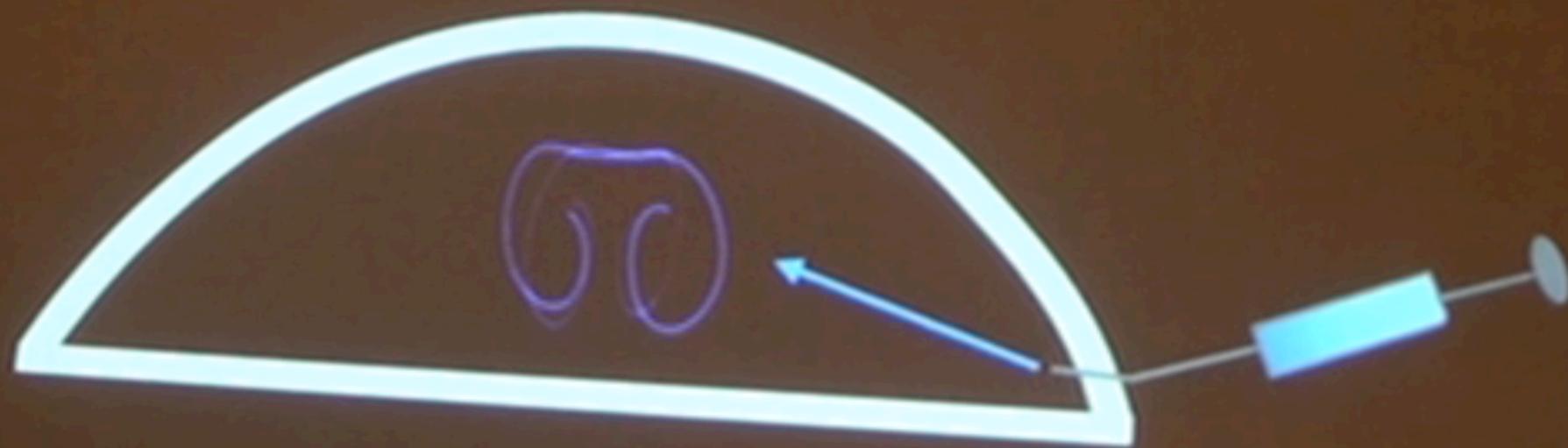
Graft Rollover

Aim along iris or corneal plane



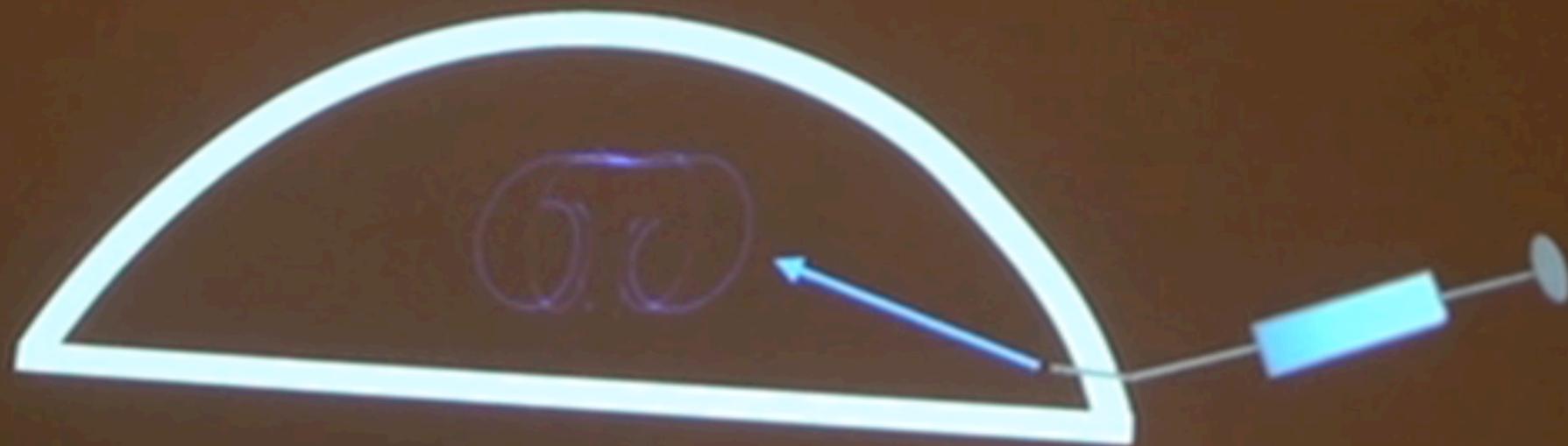
Graft Rollover

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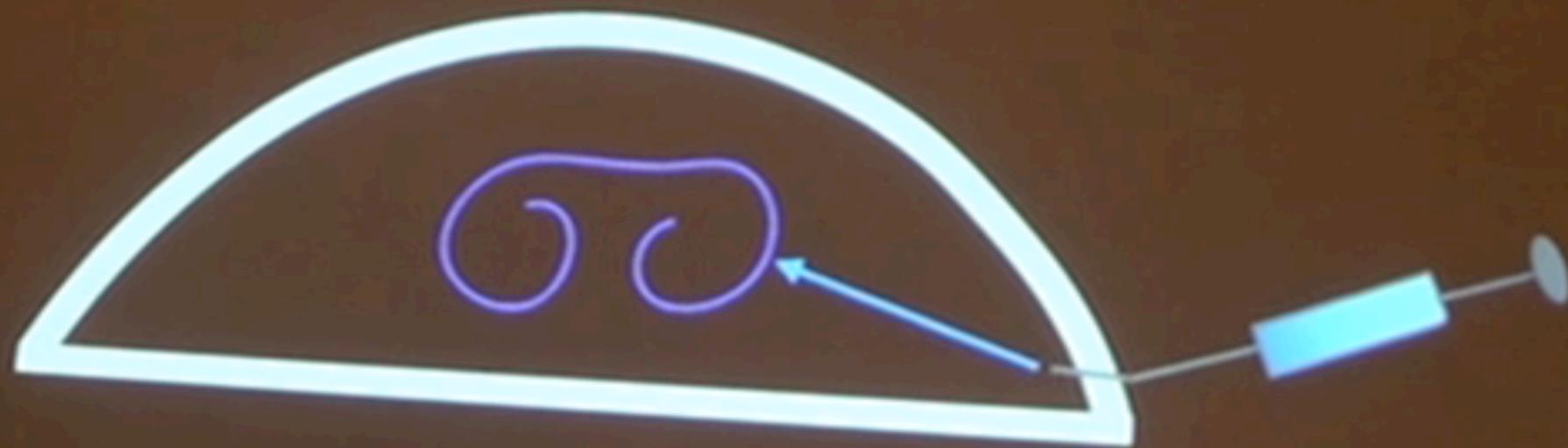
Graft Rollover

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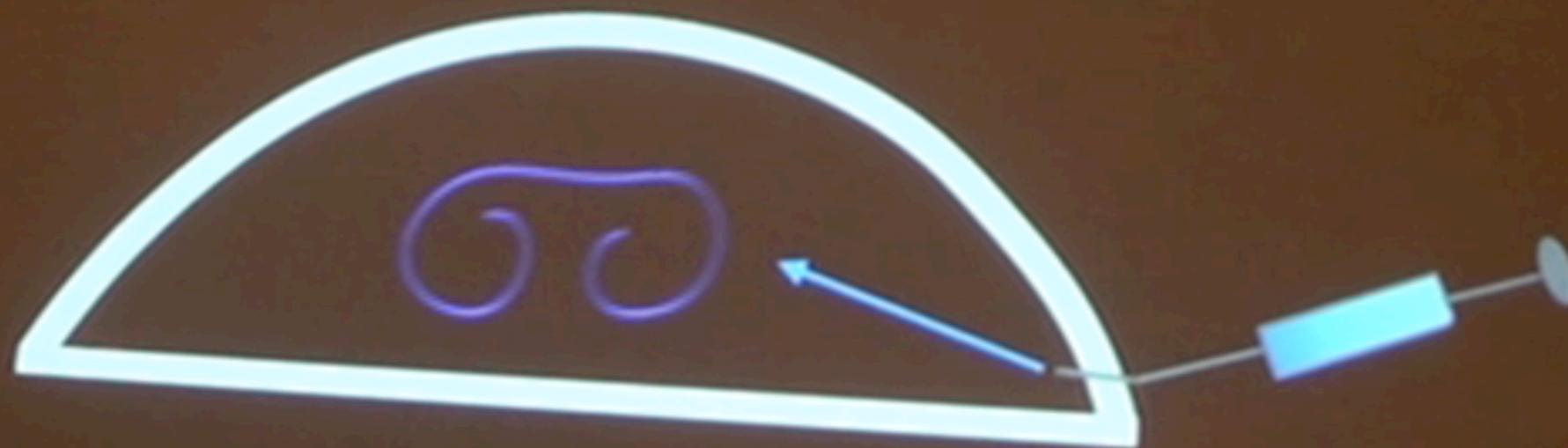
Graft Rollover

Aim along iris or corneal plane



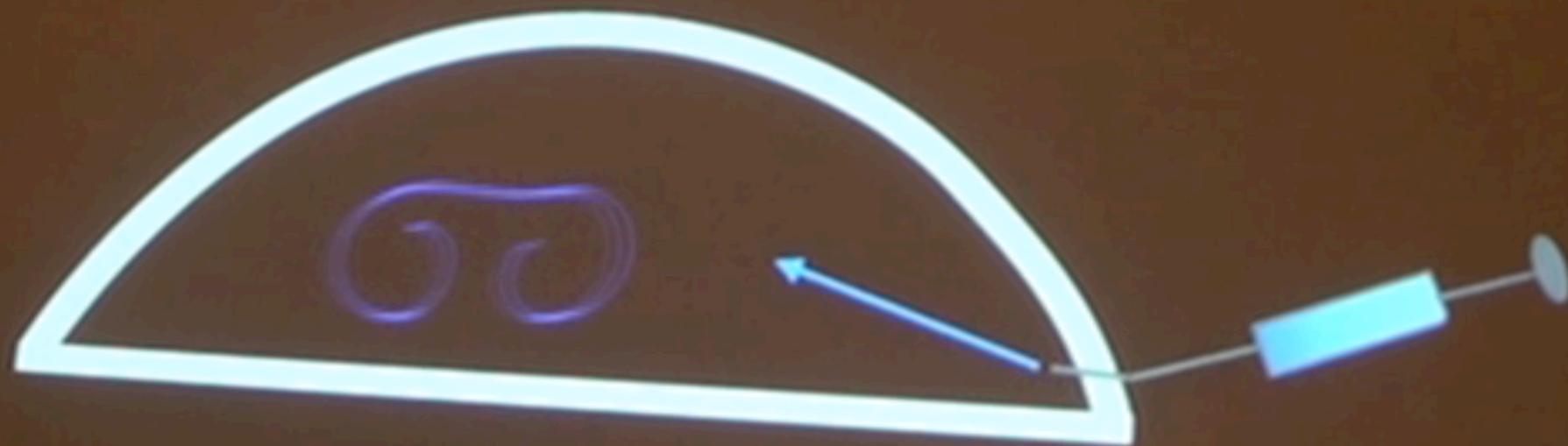
Graft Rollover

Aim along iris or corneal plane



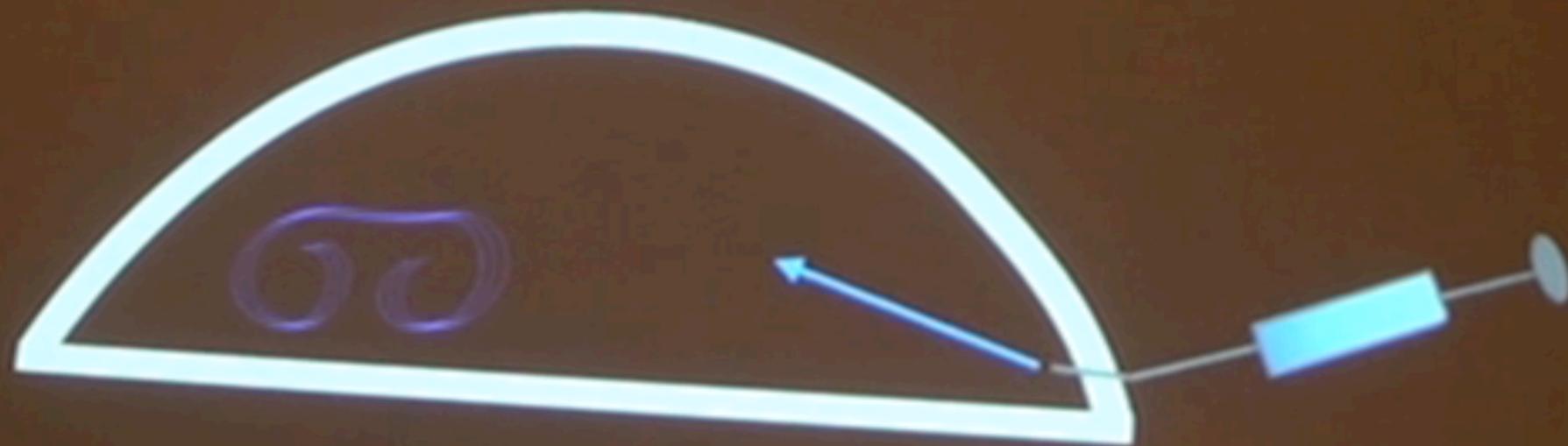
Graft Rollover

Aim along iris or corneal plane



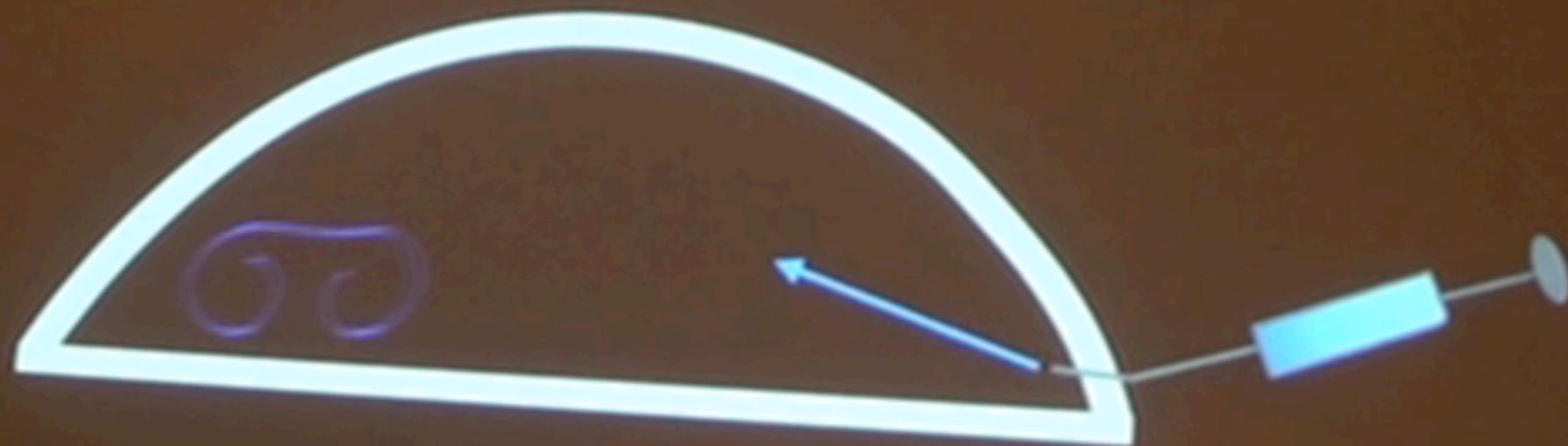
Graft Rollover

Aim along iris or corneal plane



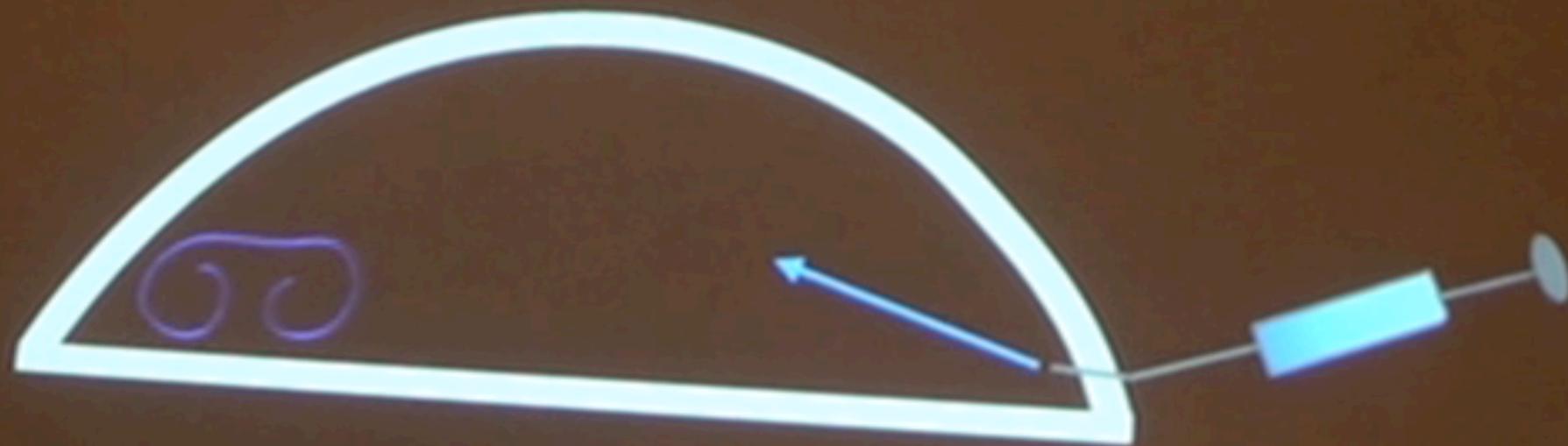
Graft Rollover

Aim along iris or corneal plane



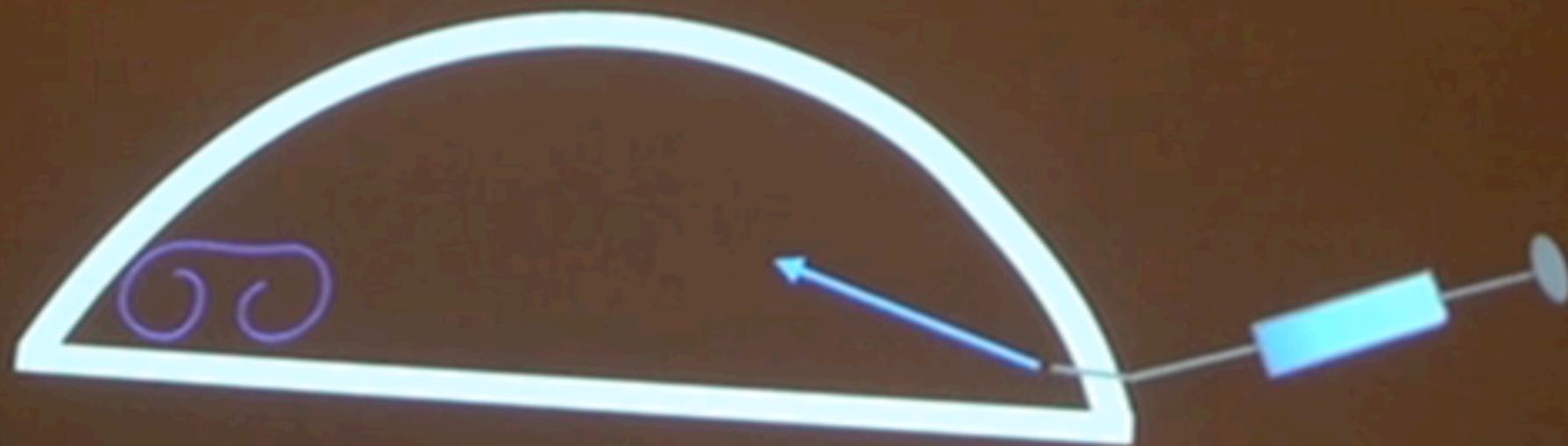
Graft Rollover

Aim along iris or corneal plane



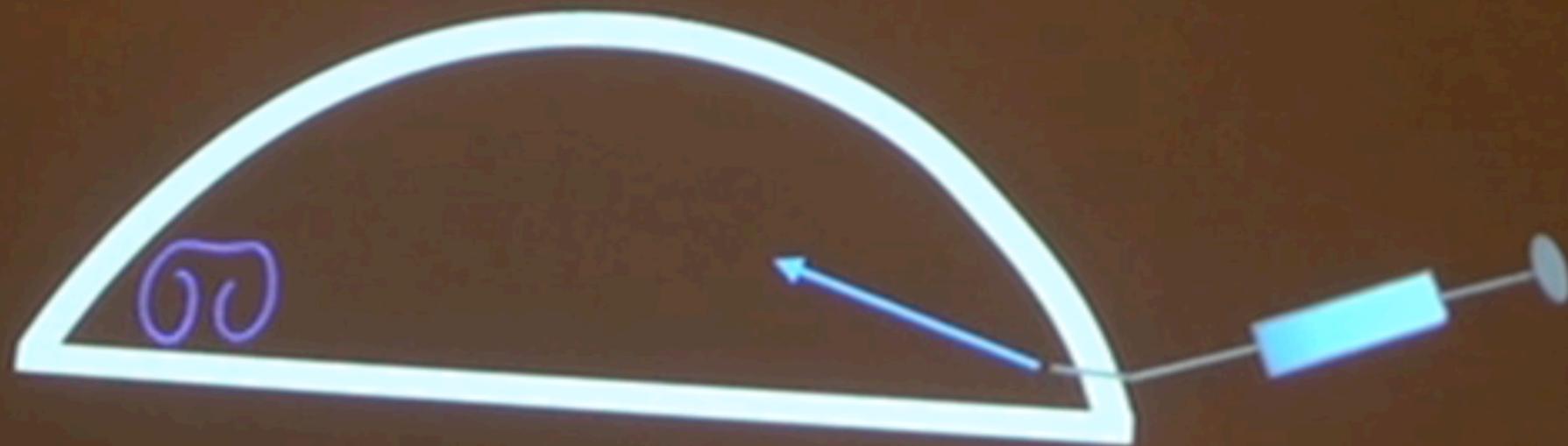
Graft Rollover

Aim along iris or corneal plane



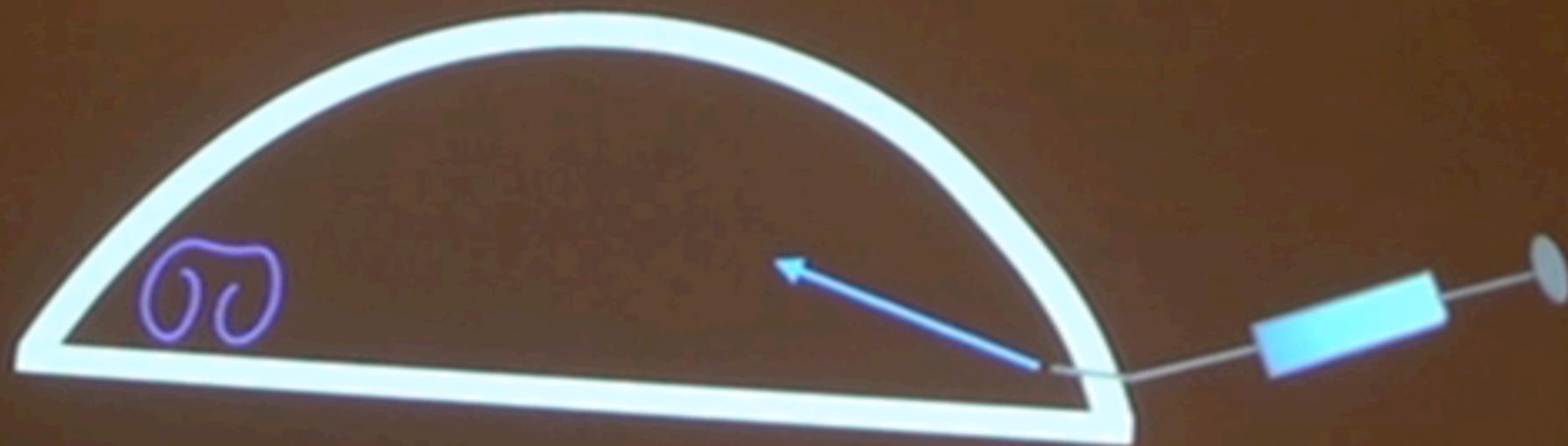
Graft Rollover

Aim along iris or corneal plane



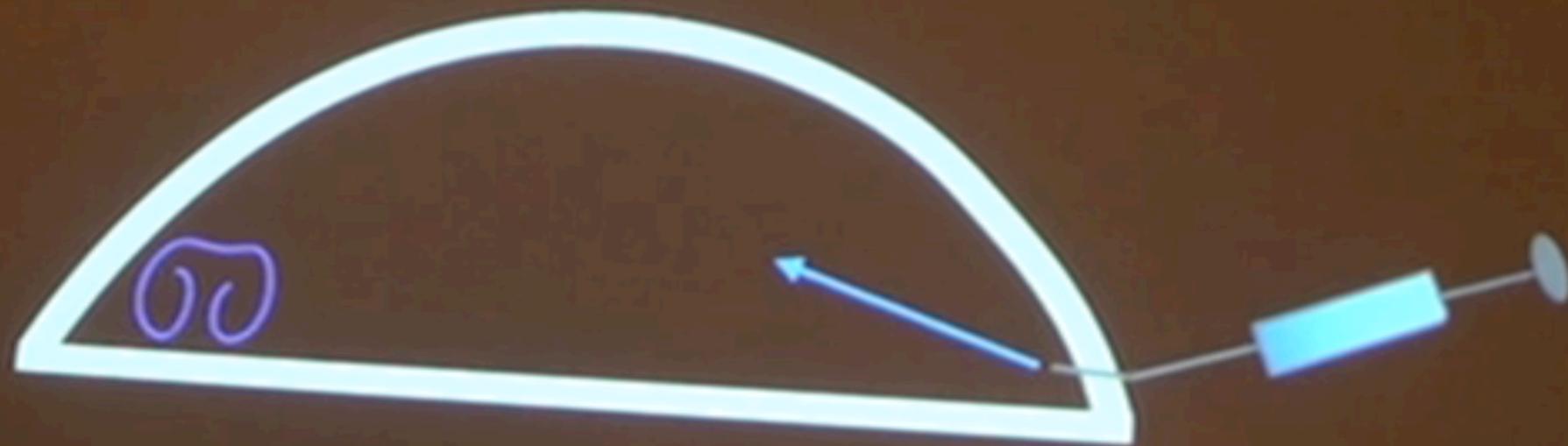
Graft Rollover

Aim along iris or corneal plane



Graft Rollover

Aim along iris or corneal plane

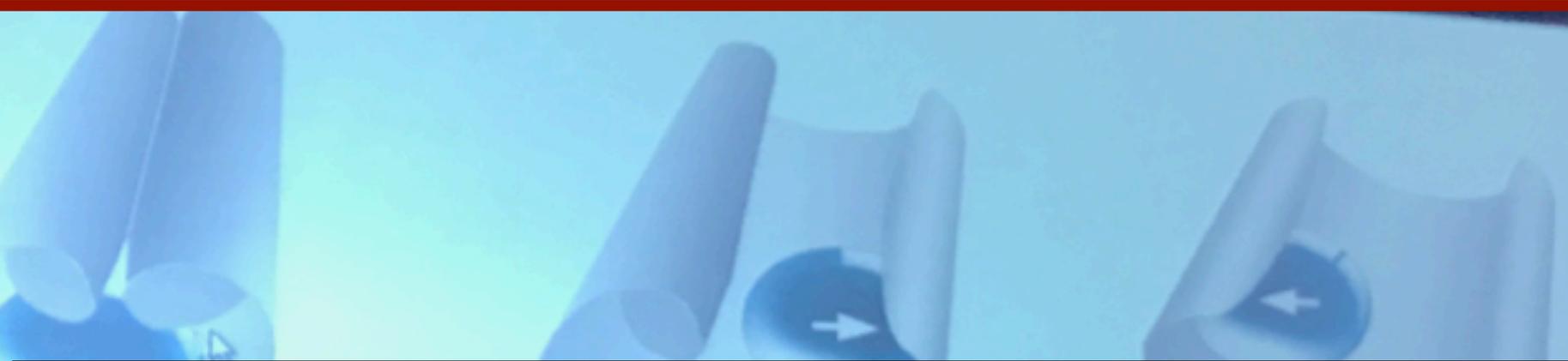


“S” ORIENTATION MARK

ADVANTAGE:
**THE MOST SURE SIGN
OF CORRECT DMEK GRAFT ORIENTATION**

DISADVANTAGE:
**IT SACRIFICES THE STROMA
&
WE CANNOT USE IT FOR DALK**

DMEK roll unfolding



***Change your tactics along the way
Use all your weapons you got
with whatever situation at hand***



Large bubble technique



Repeated fluid injection



Spatula technique

CRITERIA FOR SUCCESS

➤ Visualisation:

- A. Epithelium peeling
- B. Trypan blue staining

➤ Anterior chamber:

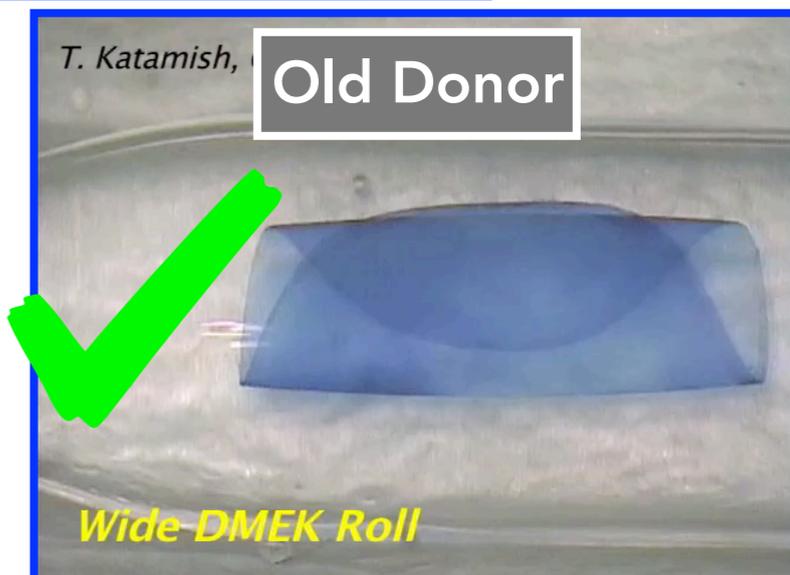
- 1. Depth & anatomy
- 2. DMEK graft size

➤ Donor age:

➤ Patience

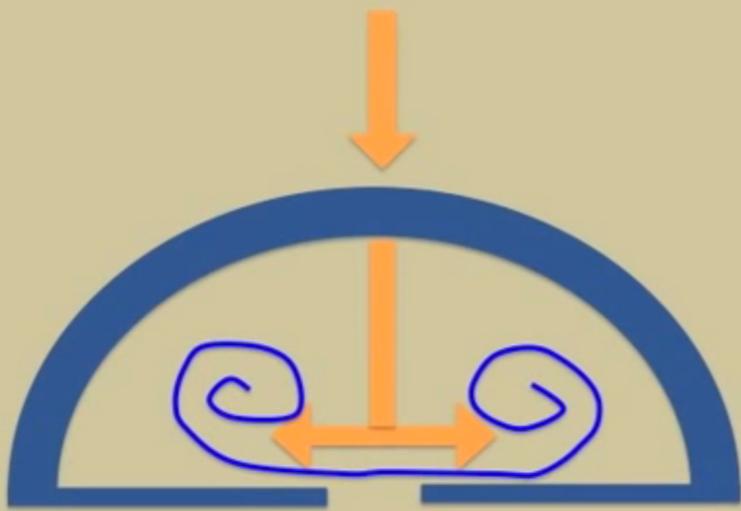


Size it right before the operation
(7.50 - 8.00 mm)



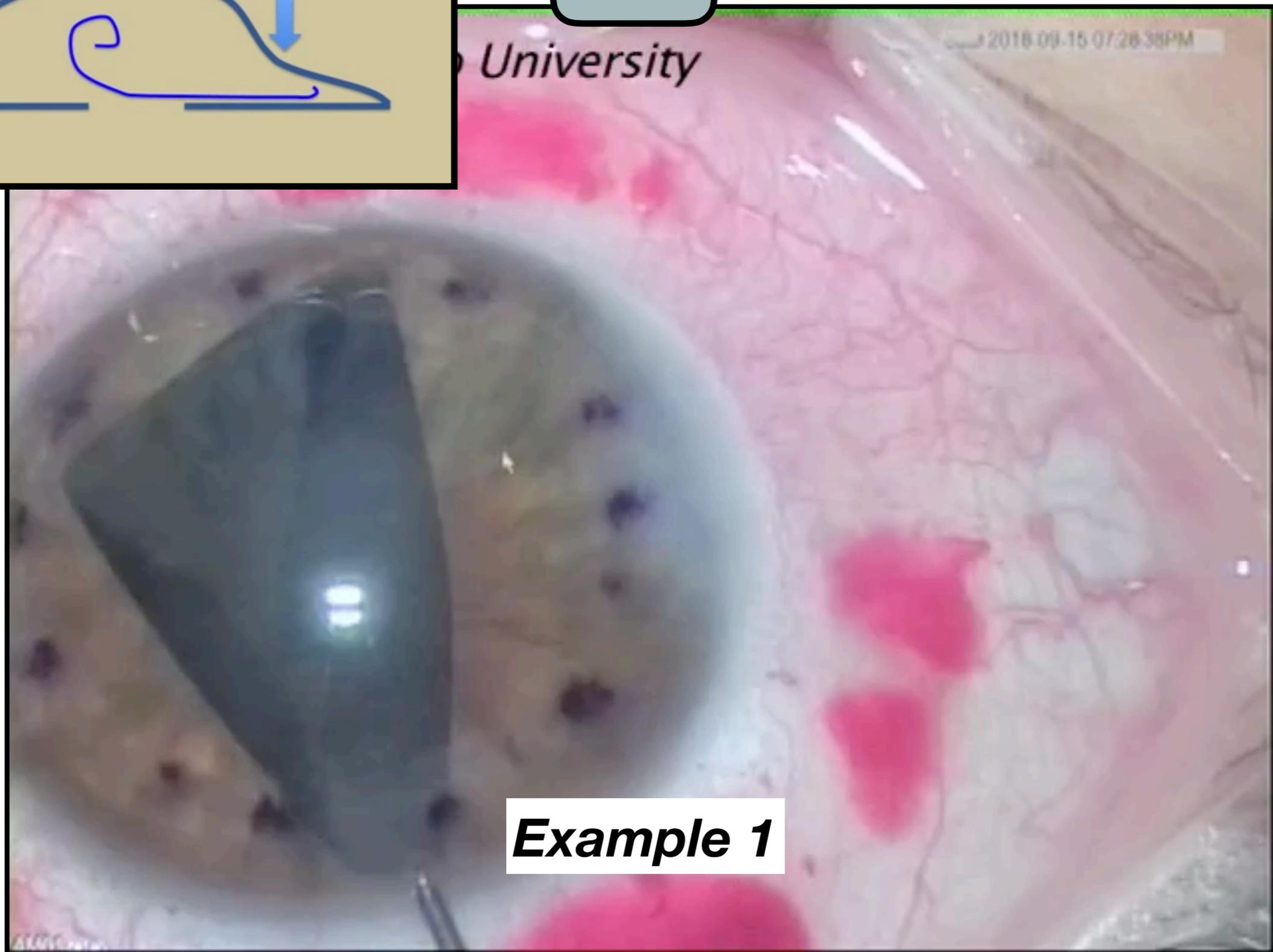
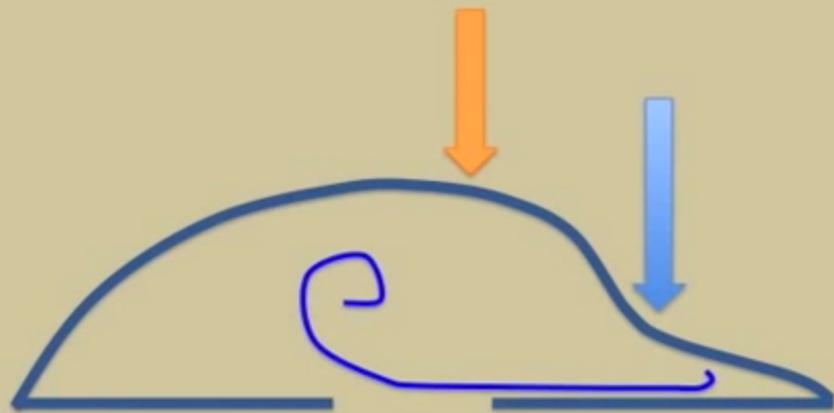
1

TAPPING TECHNIQUE



2

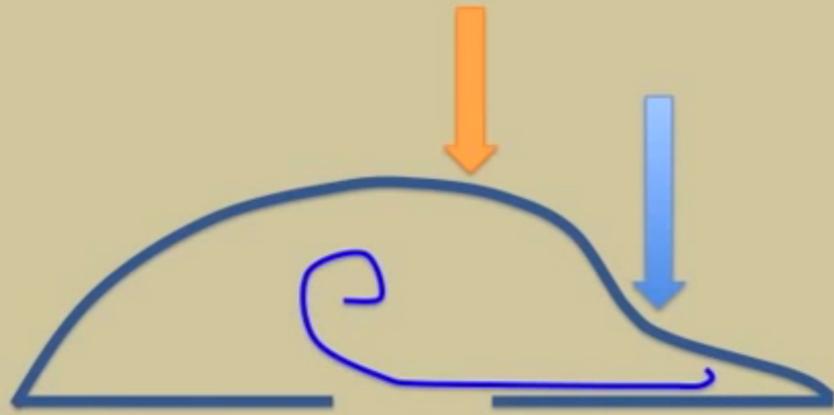
DRISIMER TECHNIQUE



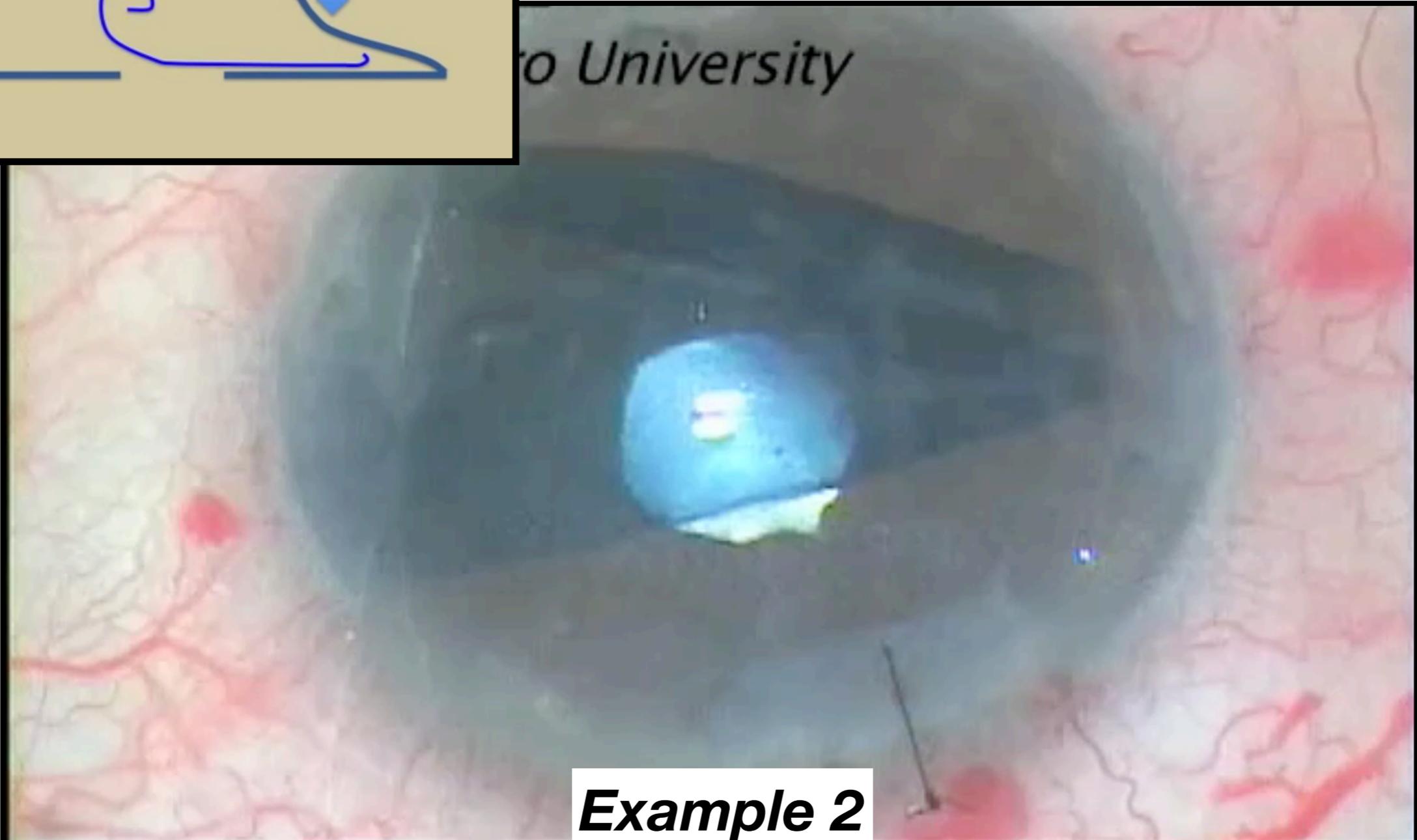
Example 1

2

DRISIMER TECHNIQUE



to University



Example 2

DMEK ROLL

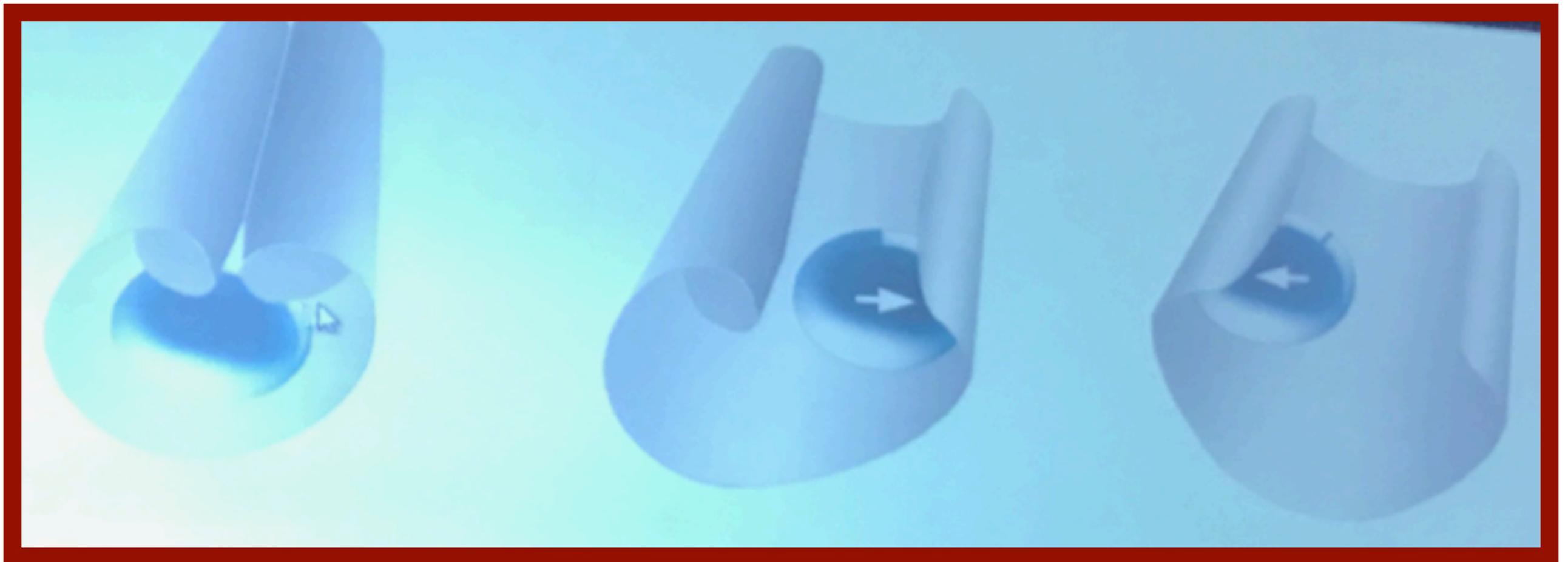
Unfolding Techniques

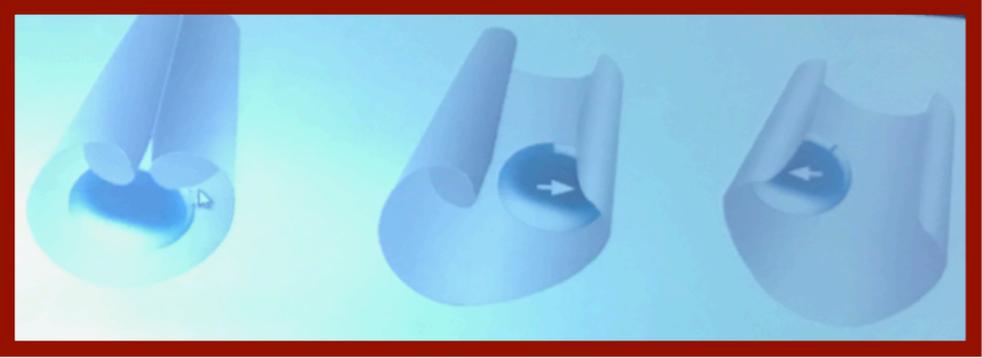
3

SMALL BUBBLE TECHNIQUE



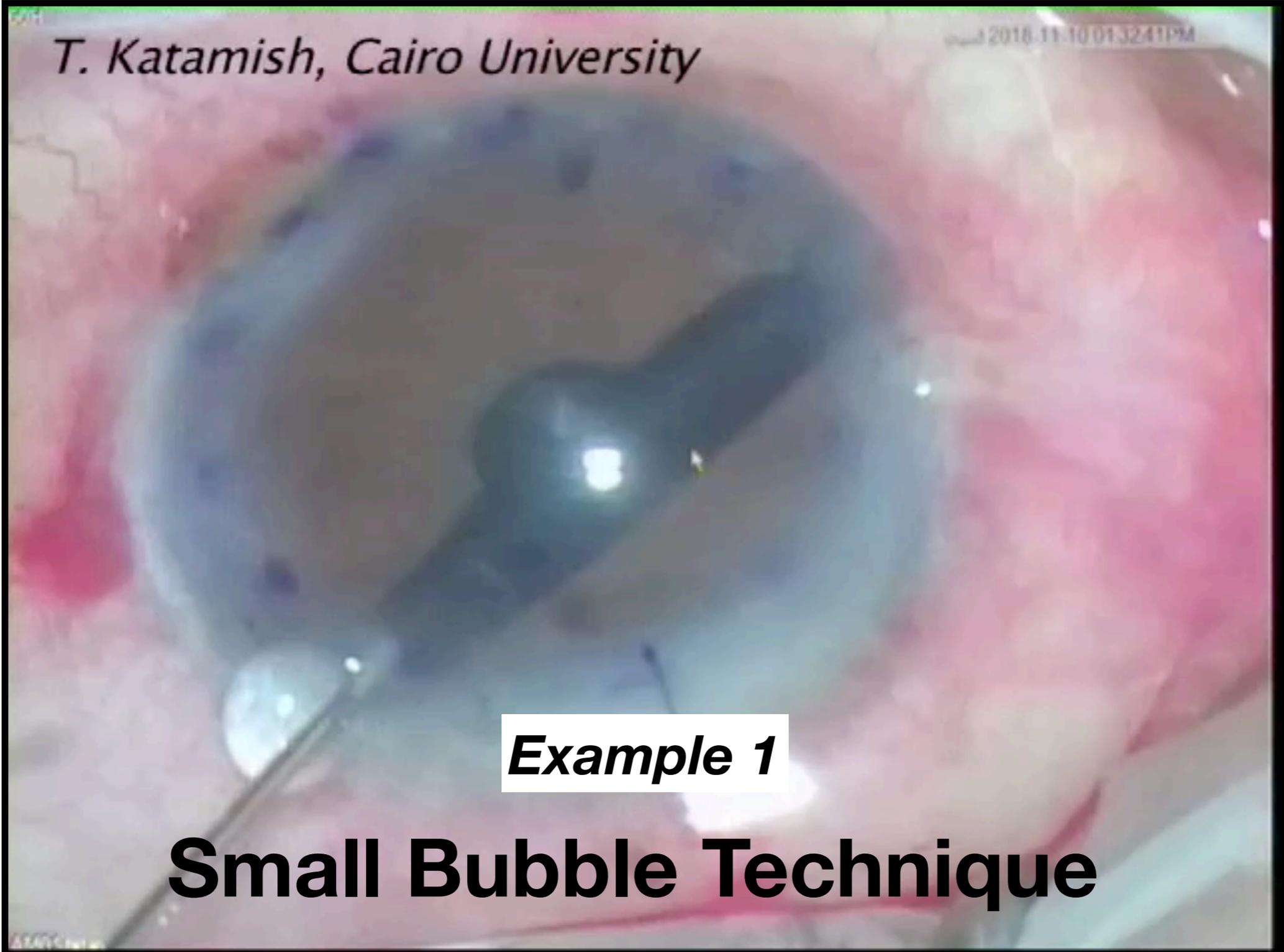
Bubble in the roll





3

SMALL BUBBLE TECHNIQUE

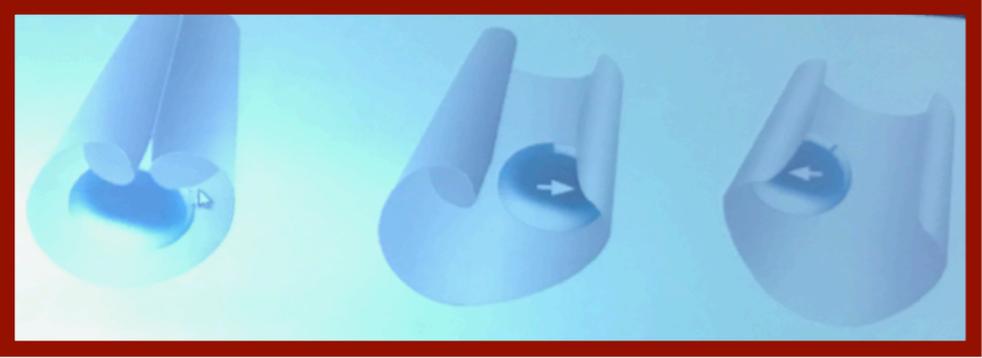


T. Katamish, Cairo University

2018-11-10 01:32:41PM

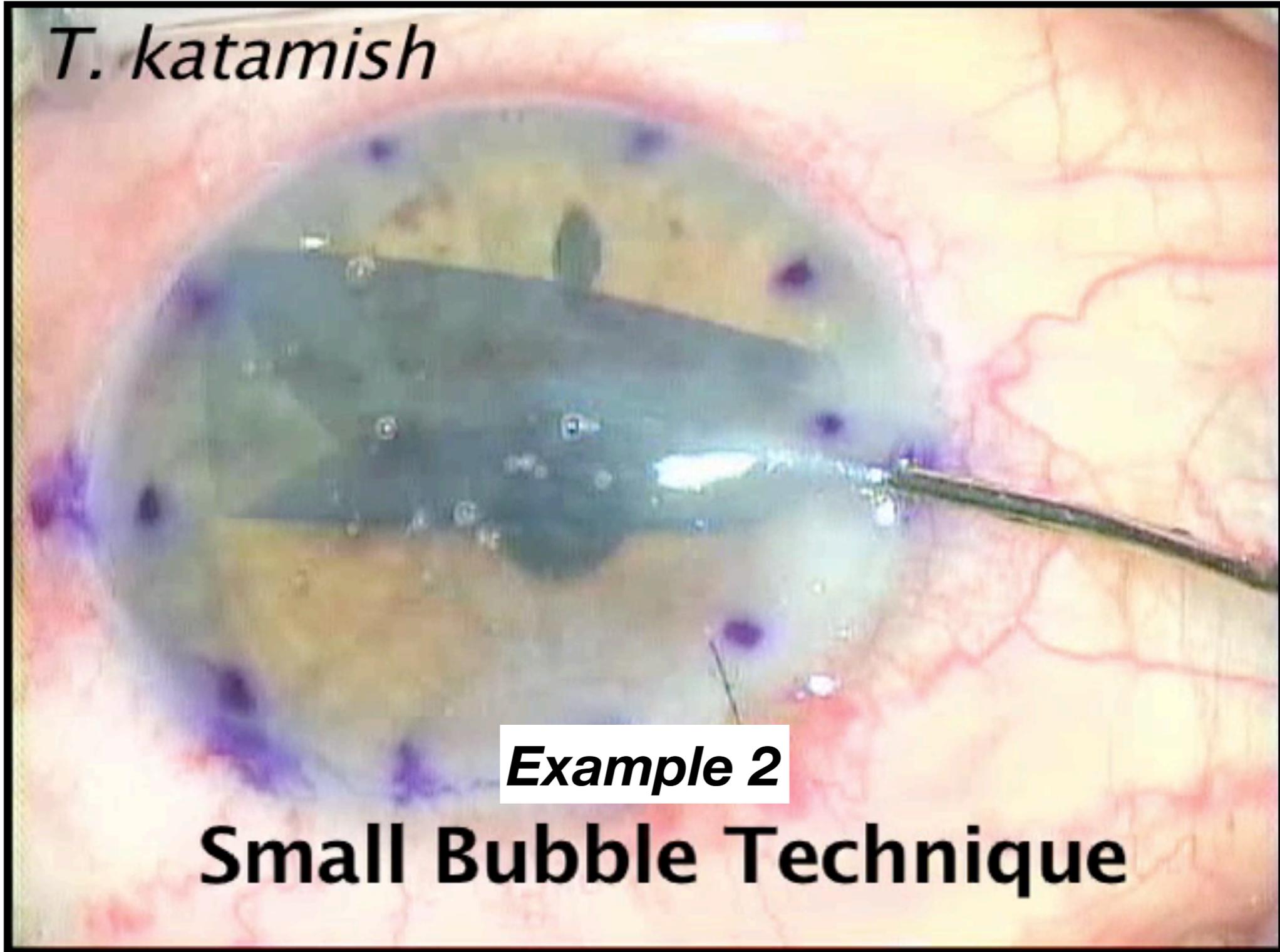
Example 1

Small Bubble Technique



3

SMALL BUBBLE TECHNIQUE



T. katamish

Example 2

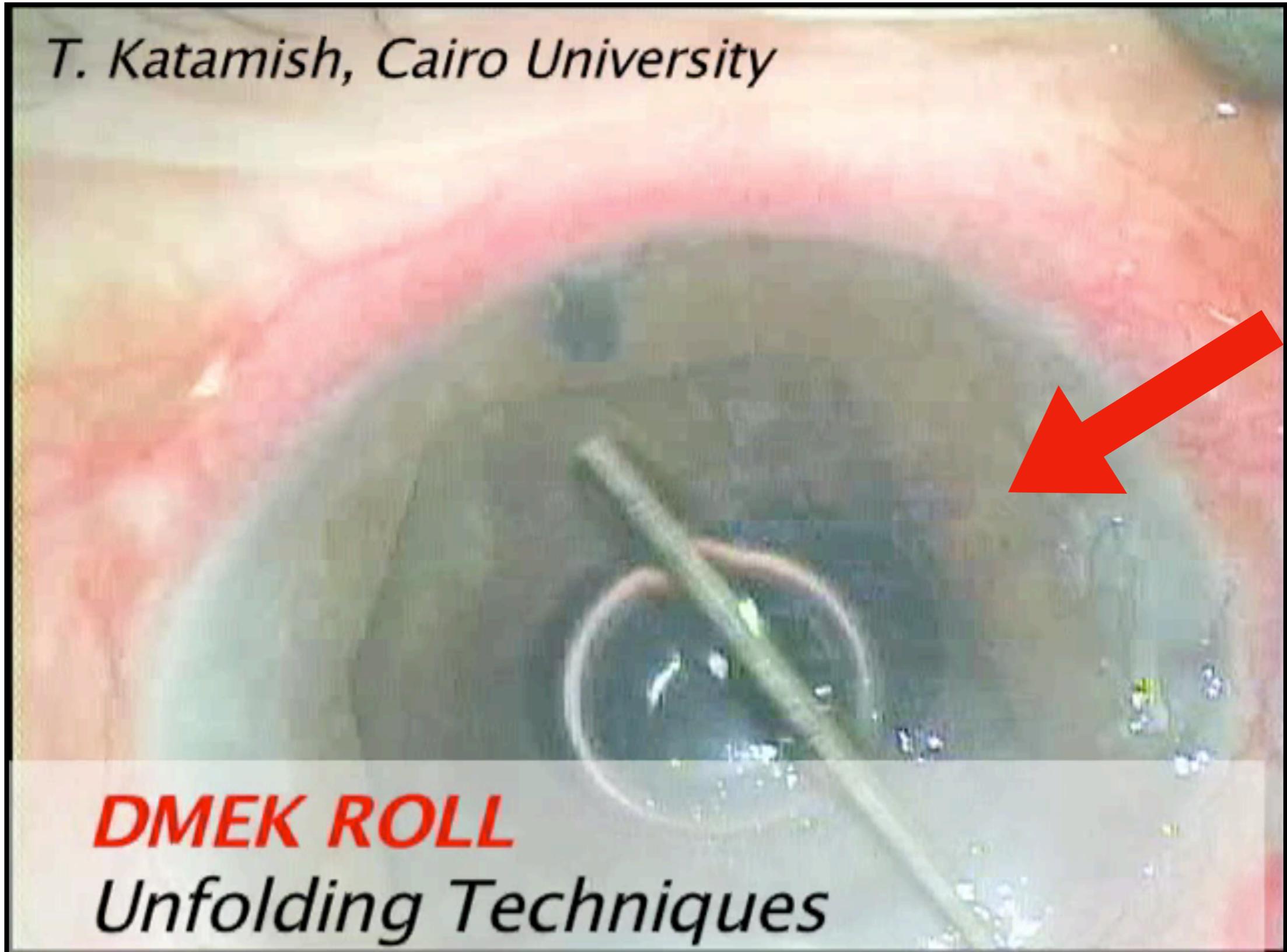
Small Bubble Technique

4

SHALLOWING TECHNIQUE



T. Katamish, Cairo University



DMEK ROLL

Unfolding Techniques

DMEK ROLL UNFOLDING TECHNIQUES



1. The AC should be **shallow** but not flat. A shallow AC allows the iris act as a 3rd finger to keep the graft from rolling back up on itself.
2. Use **short jets** of fluid and **tapping** on the corneal surface to open the graft. The aim of these maneuvers is to create small currents inside of the eye to move dance the graft into position and unscroll it.
3. It is best to maintain gross **centration** of the graft while **unfolding it** to avoid losing the graft into the angle. Sometimes the graft can become stuck in the angle and irrigation is needed to move it back toward the center of the eye.
4. In addition to centration, **orientation** is of utmost **importance**. The endothelium must be positioned facing toward the iris with the tissue scrolling up toward the stroma

DMEK ROLL UNFOLDING TECHNIQUES



Positioning the Graft

“You can’t push a DMEK graft where you want it to go,”

“You have to lead it.”

Use physics. This requires thinking about the physics of fluid and pressure as you work with this tissue.

DMEK ROLL ORIENTATION & UNFOLDING TECHNIQUES

*THOUGH IS **DIFFICULT** AND IS TAKEN
AGAINST DMEK,
BEING A DISADVANTAGE IN LEARNING
THE OPERATION,
BUT CAN BE*

SIMPLIFIED

BY THE PREVIOUS TECHNIQUES



THANK YOU



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