

FEMTO LASER CAPSULOTOMY



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- Neodymium: glass 1053 nm
(near- infrared)
- Ultrashort pulses (10^{-15})
- Light focussed at $3\ \mu$ spot size
- Accurate within $5\ \mu$
- Eliminates collateral damage and heat



(Kullman and Pineda, 2010 and Donaldson et al, 2013)

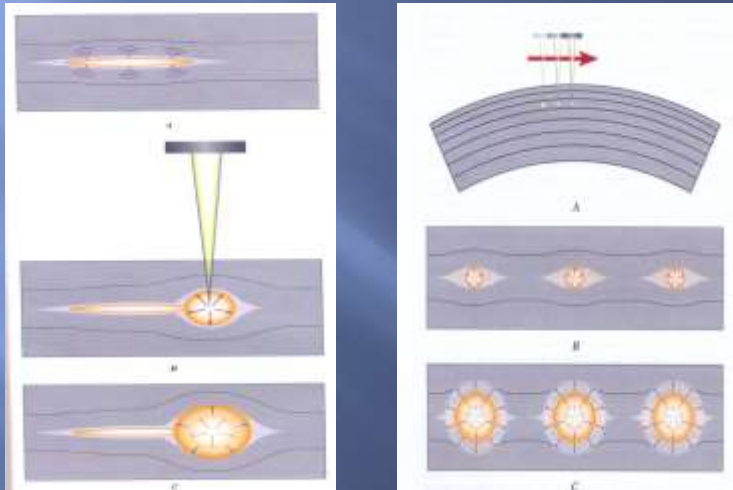
Mechanism of action:

Photodisruption:

Conversion of laser energy to mechanical energy

- ❑ Plasma formation
- ❑ Free electrons expand
- ❑ Cavitation bubbles
- ❑ Separation of tissue

(Kullman and Pineda, 2010)



(Farcovich, 2009)

- First FLACS was done by Nagy 2008, Semmelweis University, Budapest, Hungary.

(Nagy et al, 2014)

- Available platforms:

1. Catalys (Optimedica), non applanating
2. Lensx (Alcon)
3. Lensar (Lensar, Inc.), non applanating
4. Victus (Technolas)

(Schultz et al, 2013)

FL Capsulotomy:

- ▣ Shape and centration
- ▣ Edge
- ▣ Types
- ▣ Size
- ▣ Avoid complications (CBS and PCR)

(Bali et al, 2012, Roberts et al, 2013, Sutton et al, 2013 and Nagy et al, 2014)

- Main advantage of FLACS is obtaining a precise , accurate and reproducible capsulotomy *(Kohnen, 2014)*

- Proper centration of premium IOLs

(Mastropasqua et al, 2014)



Edge:

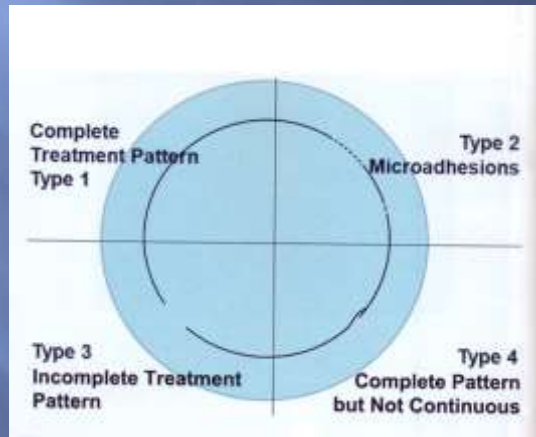
- Anterior capsule tears are more in FLACS (1.87%) than with manual CCC (0.12 %)
- FL capsulotomy integrity is compromised by postage-stamp perforations and other aberrant pulses possibly from eye movement

(Abell et al, 2014)

- FL capsulotomy stronger, (pig eye study)

(Aufarth et al, 2013)

FOUR TYPES:



(Nagy et al, 2014)

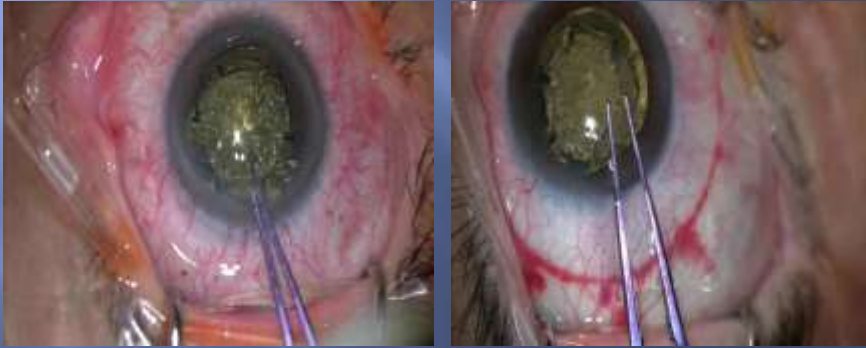
Type 1: Complete capsulotomy

▣ Free floating capsule button:

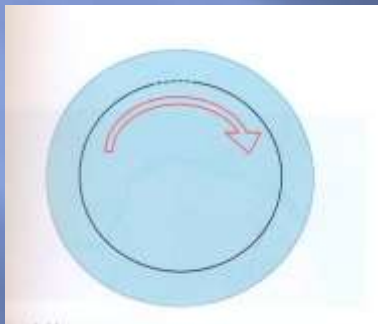
- 88 % (Chang et al, 2014)

- 17.5 % earlier cases (Nagy et al, 2014)

Video: FL capsulotomy, type 1



TYPE 2: MICROADHESIONS

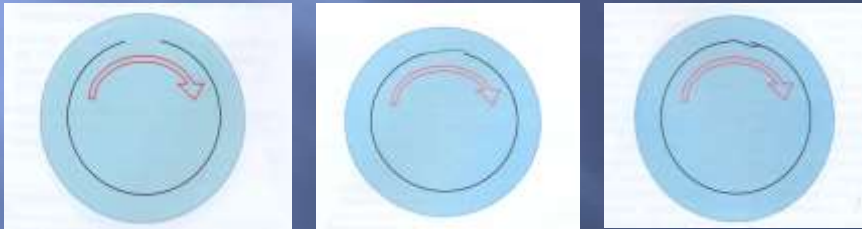


(Nagy et al, 2014)

Video: FL capsulotomy, type 2



TYPE 3: INCOMPLETE

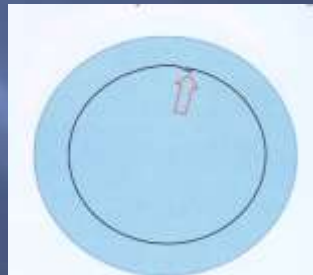
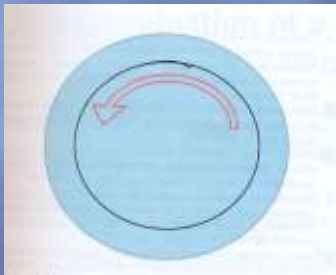


(Nagy et al, 2014)

Video: FL capsulotomy, type 3:



**TYPE 4:
COMPLETE BUT NOT CONTINUOUS**



(Nagy et al, 2014)

Video:



Size:

- ▣ FL cause shock waves up to 1 mm surrounding
- ▣ The pupil needs to be wider by 0.5 - 1.5 mm
- ▣ Miosis may occur from laser hitting pupil
- ▣ Begin dilatation earlier
- ▣ NSA drops
- ▣ No delay in phaco

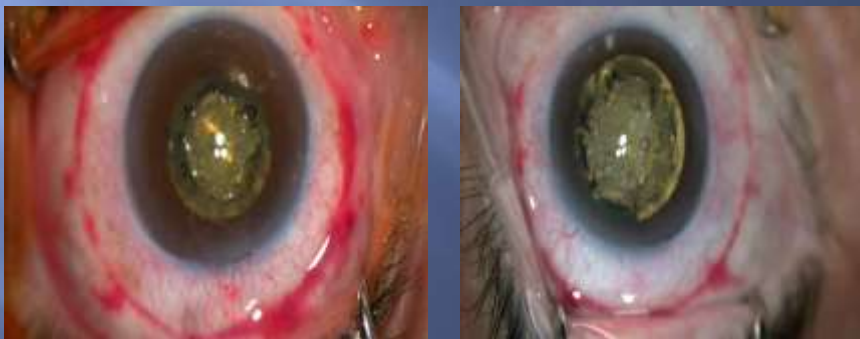
(Roberts et al, 2011 and Nagy et al, 2014)

Avoid complications:

- ❑ FL cause intralenticular gas bubbles
- ❑ Rapid hydrodissection is dangerous
- ❑ CBS and PCR are serious complications
- ❑ Gentle down pressure on nucleus
- ❑ *Rock n Roll technique*

(Nagy et al, 2014)

Rock n Roll



Take home message:

- ❑ FLACS has a learning curve
- ❑ Some adjustments are required during casulotomy, lens fragmentation and wound creation
- ❑ Caution avoids complications



Thank You

