



VII INTERNATIONAL OPHTHALMOPLASTIC & OPHTHALMOPLASTIC TRAINING COURSES

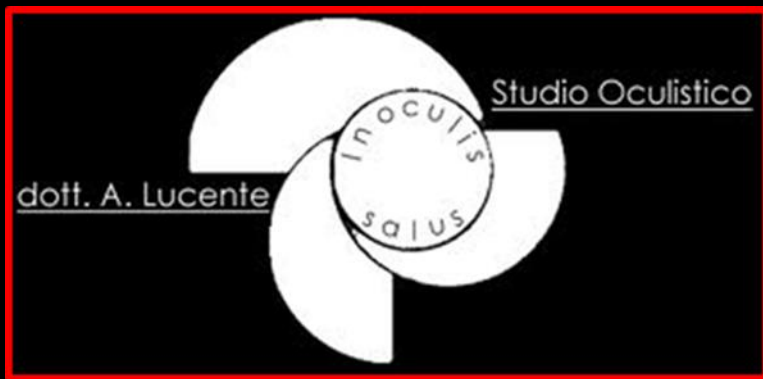
L'utilizzo dei Laser in Oftalmologia

caratteristiche dello strumento e tecnica di utilizzo

Moderatori: M. Di Maita (Catania), A. Mancini (Taurianova-RC), C. Martorana (Siacca-AG)

Capsulotomia e iridotomia Yag laser

Amedeo Lucente



Acireale 8 • 9 • 10 Ottobre 2015

Presidenti del VII INTERNATIONAL OPHTHALMIC
& OPHTHALMOPLASTIC TRAINING COURSES
**Mauro Fioretto, Antonello Rapisarda, Alfredo
Reibaldi**

Presidenti del 4° Corso di Base
CHIRURGIA OPHTHALMOPLASTICA E
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SEGRETERIA SCIENTIFICA

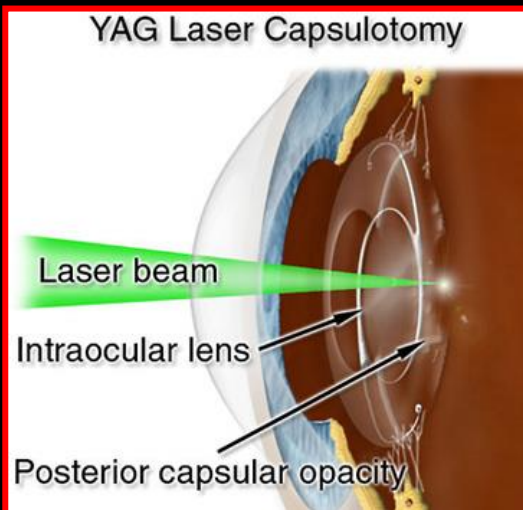
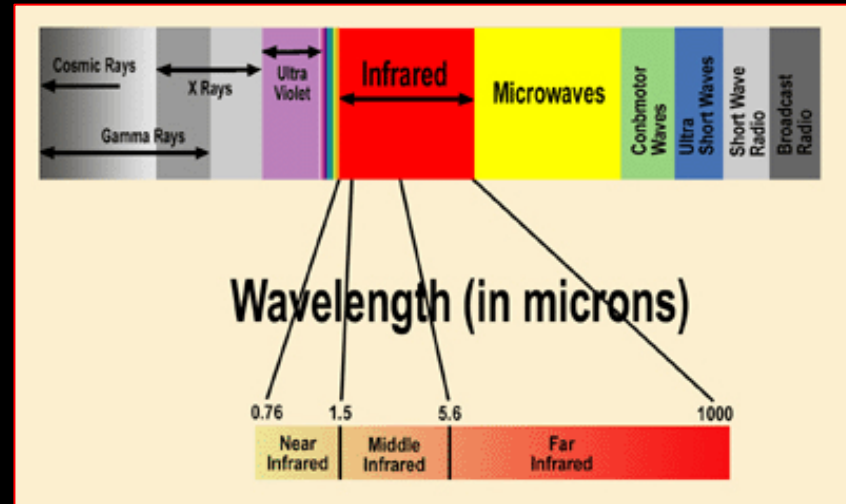
Maurizio Di Cicco, Matteo Orione, Giuseppe Scalia

Disclosure

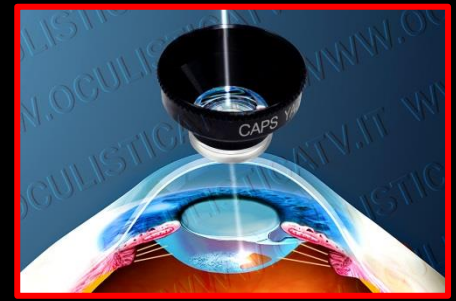
Consulting Free

- Carl Zeiss Meditec
- Alfa Intes

- **Nd:YAG** è un laser a stato solido che sfrutta come mezzo laser attivo un cristallo di ittrio e alluminio (YAG) drogato al neodimio **Nd:Y₃Al₅O₁₂**
- **Nd:YAG** Neodymium-**d**oped **Y**ttrium **A**lluminium **G**arnet (**NY:Y₃Al₅O₁₂**)
- **1964** Laser operation of Nd:YAG was first demonstrated by **J. E. Geusic** **Bell Laboratories** (New Jersey)
- **1980** **Fankhauser e Aron-Rosa** first YAG capsulotomy
- **1064 nm wavelength**
- **Optical breakdown** results in **ionization**, or **plasma formation** (electromechanical interaction)



Preparation of the patient

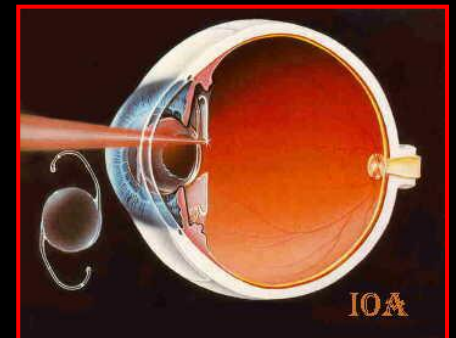


Before Treatment Session

- Complete ophthalmic history and examination
- Discussion of proposed procedure, including risks, benefits, and alternatives; signing of informed consent form
- Apraclonidine or beta-adrenergic blocking agent
- Pupillary dilation (optional)
- Determination of visual axis and normal pupillary size: sketch and preliminar laser marker shot
- **indomethacin drops 0.50%**

At the Laser

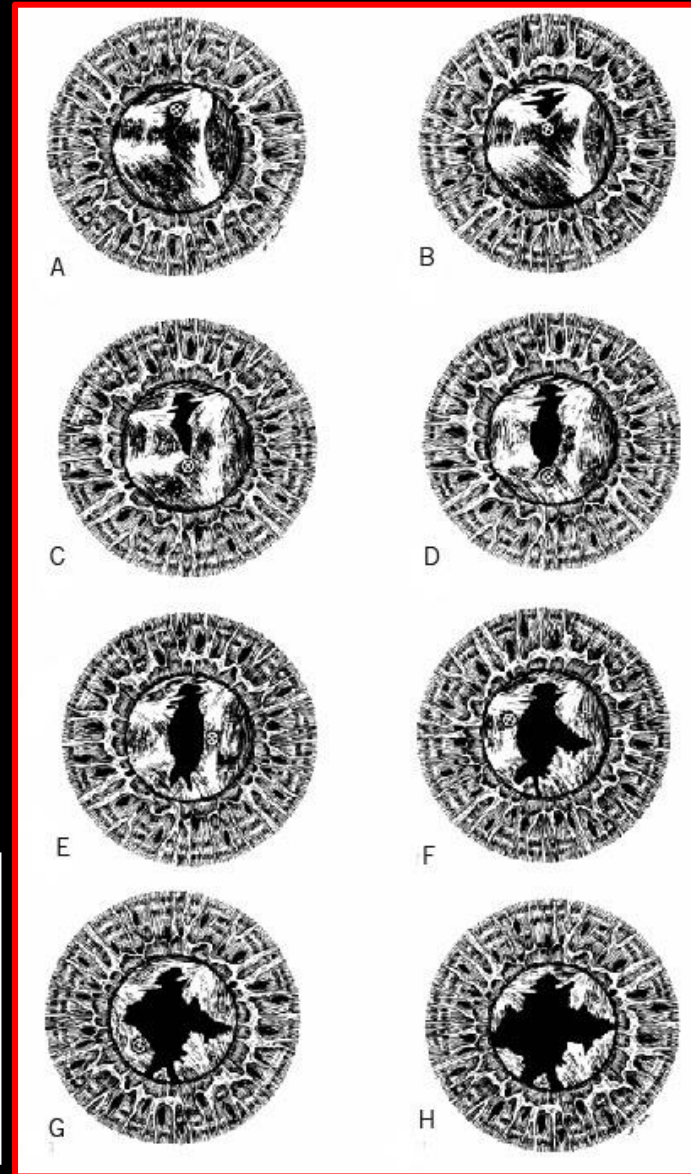
- Review of the procedure, the expected pop or click, and the importance of fixation
- Application of topical anesthetic if contact lens is to be used
- Adjustment of stool, table, chin rest, and footrest for optimal patient comfort
- Application of head strap to maintain forehead position
- Darkening of the room (optional)
- Provision of fixation target for fellow eye
- Illumination of target if room is darkened
- **Photograph the opacity**



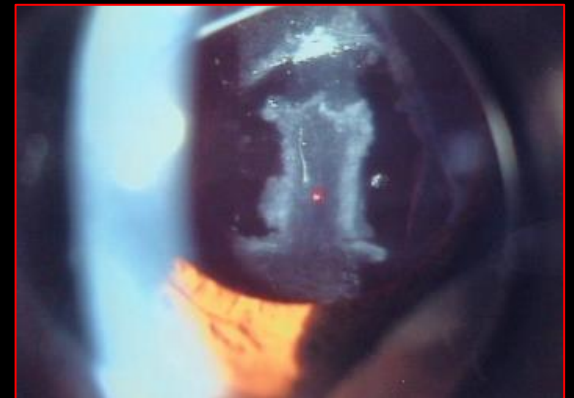
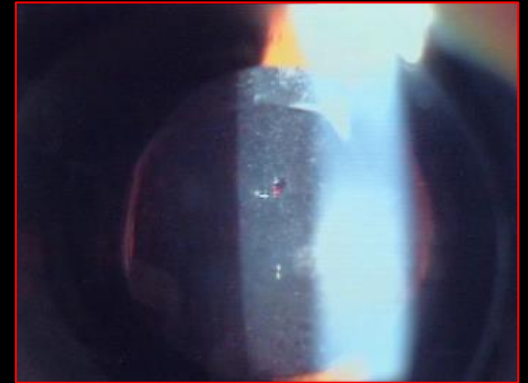
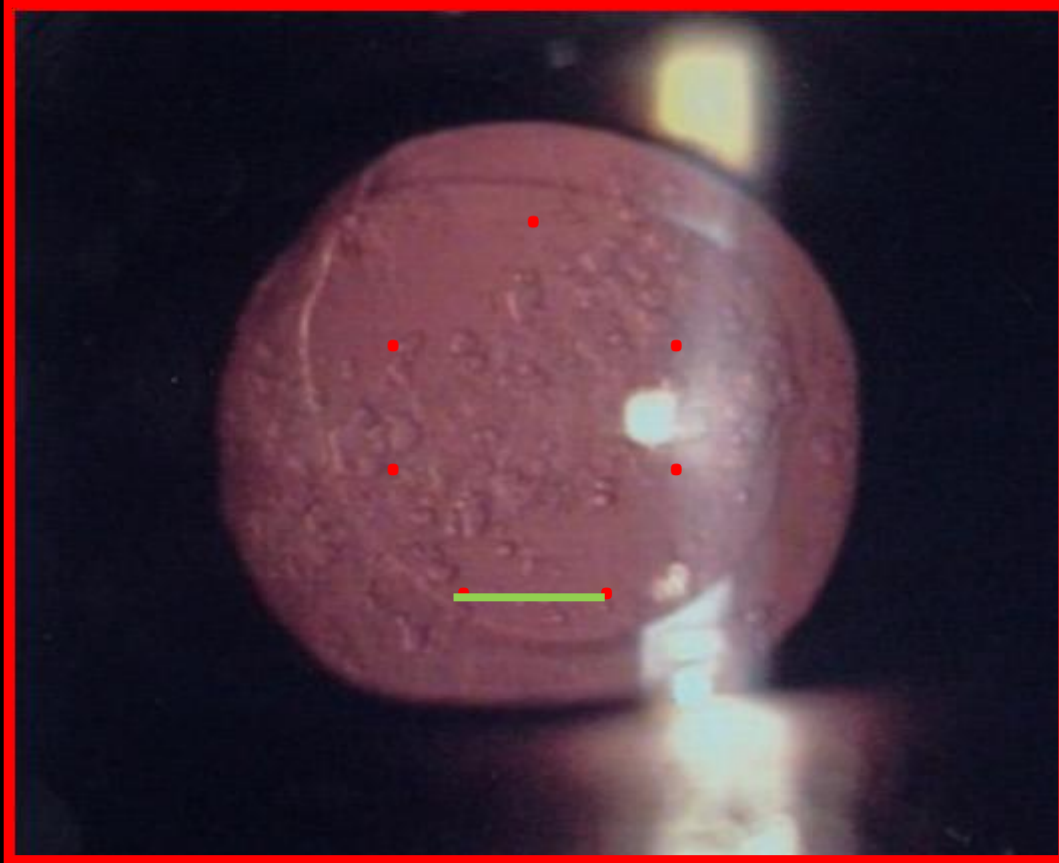
Sequential capsulotomy photographs

By Roger F. Steinert, MD UCI University of California, Irvine

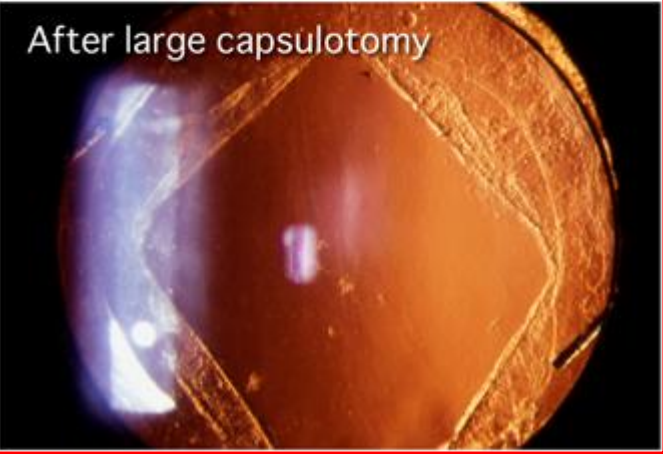
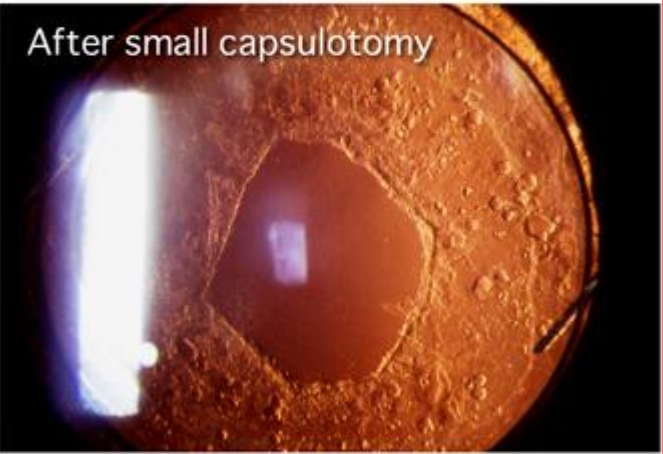
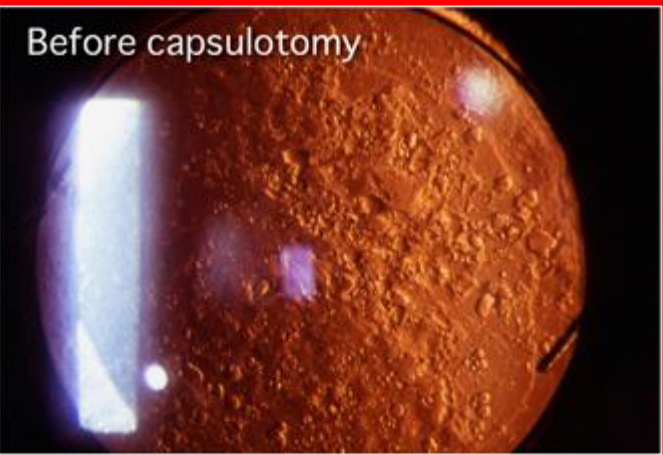
- Use minimum energy **1 mJ** if possible
- Identify and cut across tension lines
- Perform **a cruciate opening begin at 12 o'clock progress toward 6 o'clock and cut across at 3 and 9 o'clock**
- Clean up any residual tags
- Avoid freely floating fragments



My capsulotomy



- The capsulotomy should be performed in the superior position, similar to driving at night, when glare is most likely to occur
- A small opening might be sufficient for most patients, but there is a higher risk of retinal detachment
- A small opening in a dense capsule may result in the same visual quality as those of a small pupil
- When the capsule is only partially removed, a small opening is an improvement over no opening
- As the patient looks up, the capsular edges behind the sphincter may be visible
- Capsulotomies may increase the size of the opening, with enlargement tending to be more pronounced in the inferior position
- Glare and haze remain a problem with a 3-mm opening, and a larger opening is needed for better visual quality



opic conditions, such as myopia, where the light source is most likely to be in the superior position

with a higher risk of retinal detachment

ent optics, analogous to a small pupil

the retina, a small opening

can be applied to capsular opacification, which can be perfectly centered

in 6 weeks with capsular bag retention

capsular openings, decrease the size of the capsular opening

Contraindications to laser capsulotomy

Absolute Contraindications

- Corneal scars, irregularities, or edema that interfere with target visualization or make optical breakdown unpredictable
- Inadequate stability of the eye
- Inadequate stability of the IOL

Relative Contraindications

- Known or suspected cystoid macular edema CME
- Active intraocular inflammation
- High risk for retinal detachment

- **Intraocular Pressure Elevation** greater than **10 mmHg** have been observed in **15% to 67%** peaks at **3 to 4 hours**, decreases but may remain elevated at **24 hours**, and usually returns to baseline at **1week**
- **Cystoid Macular Edema CME 0.55% to 2.5%**
- **Retinal detachment 0.08% to 3.6%**
- Asymptomatic **retinal breaks** were found at a rate of **2.1%** within 1 month
- Intraocular **Lens Damage, Pitting** of IOLs occurs in **15% to 33%** of eyes not visually significant, although rarely the damage may cause **sufficient glare** and image degradation that the damaged IOL must be explanted
- Propionibacterium acnes **endophthalmitis** has been reported
- **Iritis** persisting for **6 months** has been reported in less than **1%**
- **Macular holes** have **rarely**
- Specular microscopic studies have reported **corneal endothelial cell loss** of **2.3% to 7%**
- **IOL dislocation IOL movement and refractive changes**

Conclusions

An Overview of Nd:YAG Laser Capsulotomy

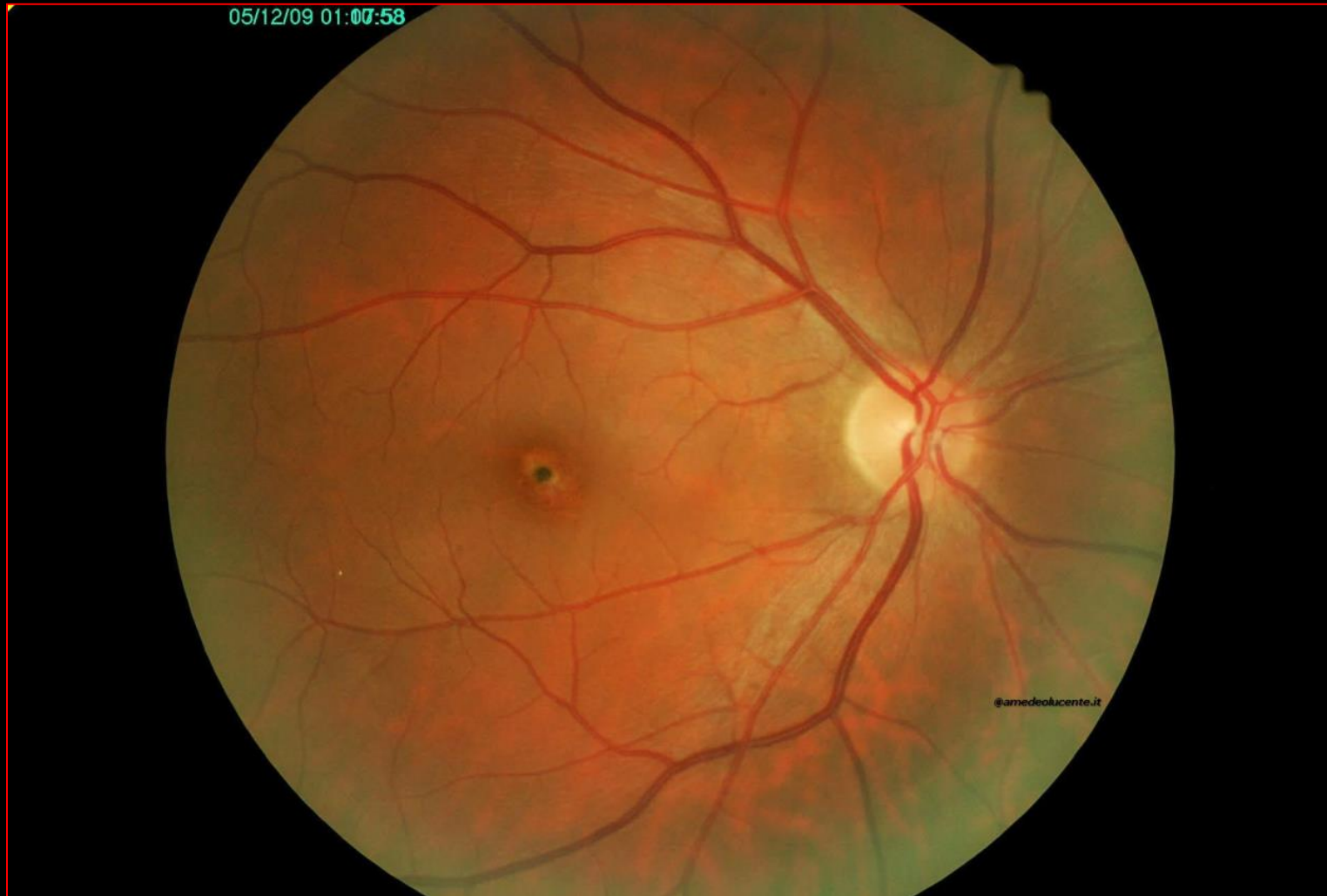
Eyyup Karahan Duygu Er Suleyman Kaynak

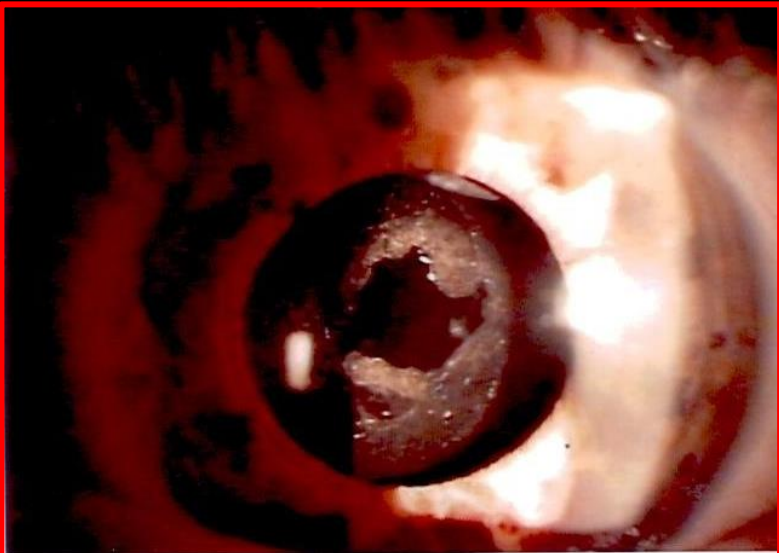
Department of Ophthalmology, Izmir, Turkey

Review Med Hypothesis Discov Innov Ophthalmol. 2014; 3(2)

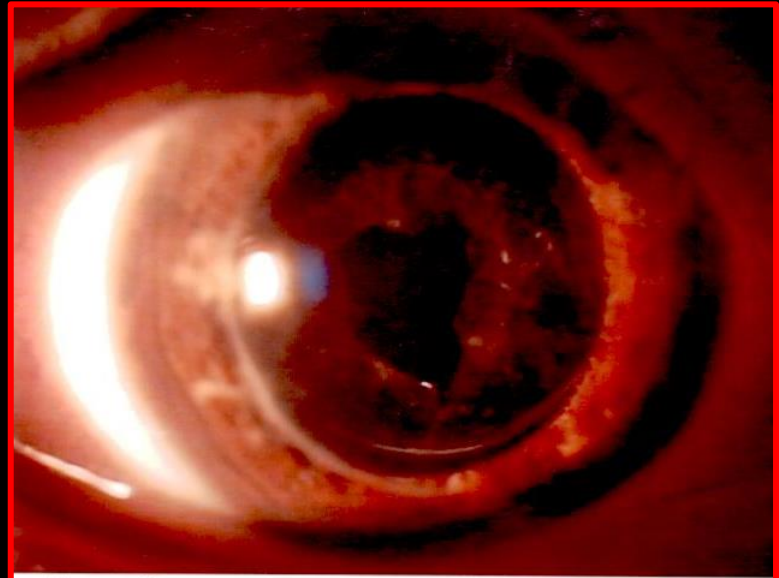
In conclusion, some complications especially rise in IOP and macular thickness seems to be unavoidable after Nd: YAG laser capsulotomy. Using less total energy and performing smaller capsulotomies are practical choices to decrease complications after Nd:YAG capsulotomy

Optical breakdown results in ionization, or plasma formation in the ocular tissue

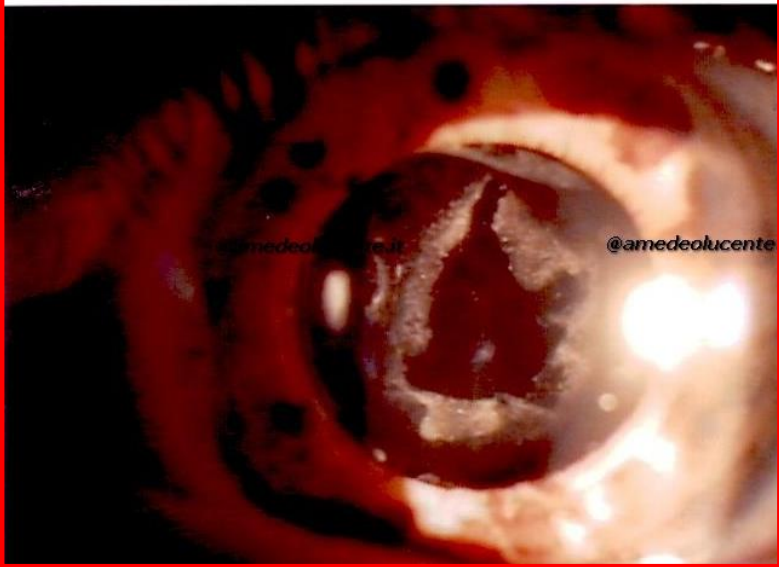




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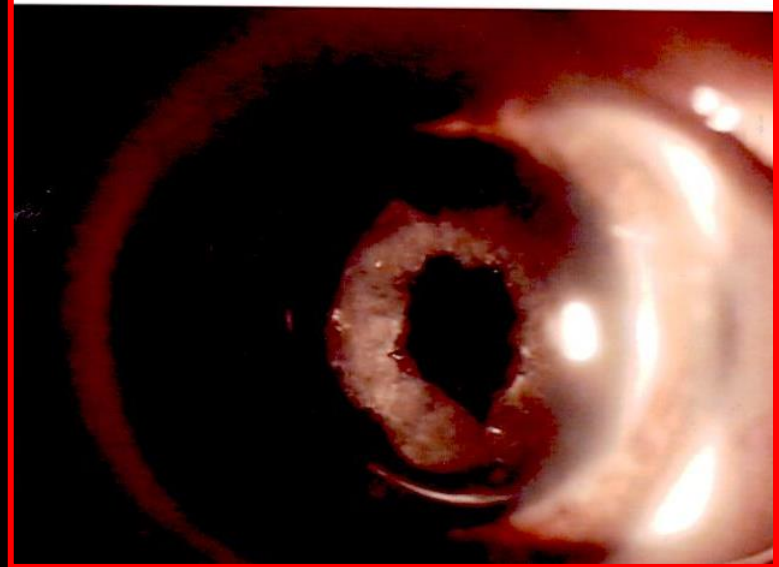


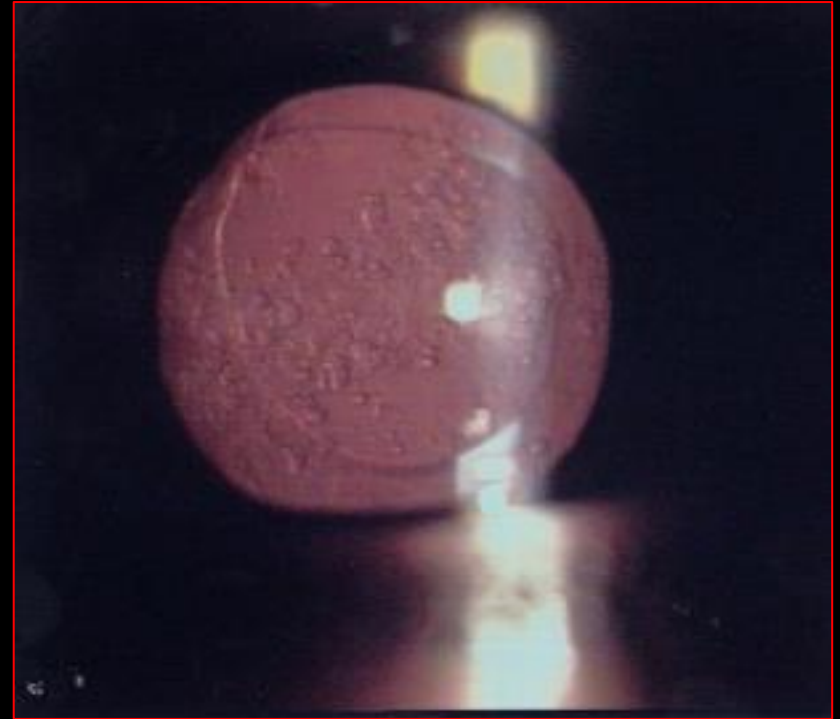
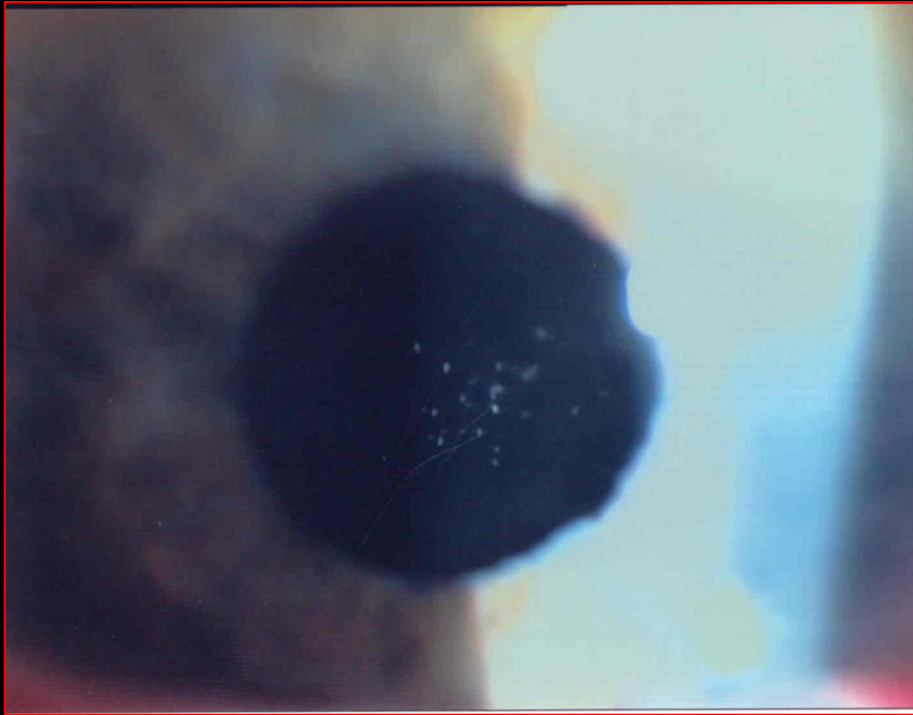
AA П



@amedeolucente

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- Impact point offset by 30 to 200 μm behind the focal plane
- Constant pulse duration of 4 nanoseconds
- 8/10 μm spot diameter
- Minimum energy from 0.5 mJ
- Energy adjustable up to 10 mJ

Iridotomy

Background

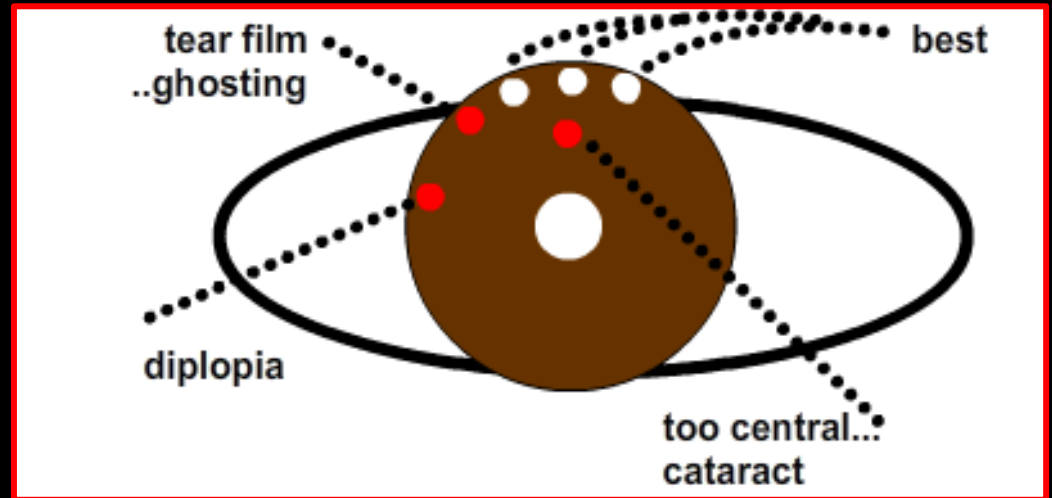
Laser peripheral iridotomy (LPI) is the preferred procedure for **treating angle-closure** glaucoma caused by relative or absolute pupillary block. LPI eliminates pupillary block by allowing the aqueous to pass directly from the posterior chamber into the anterior chamber, **bypassing** the pupil. LPI can be performed with an **argon laser**, with a **Nd:YAG laser**, or, in certain circumstances, **with both**

Indications

- Acute angle-closure glaucoma
- Chronic angle-closure glaucoma
- Fellow eye of acute angle-closure glaucoma
- Narrow/occludable angle
- Miscellaneous conditions, including phacomorphic glaucoma, aqueous misdirection, nanophthalmos, pigmentary dispersion syndrome, and plateau iris syndrome

Contraindications

- Corneal edema
- Corneal opacity
- Flat anterior chamber



Periprocedural Care

- Patient Education/Informed Consent
- Nd:YAG laser an argon laser **or both are needed**
- **Using a contact lens** makes the procedure easier
- **Abraham lens or a Wise lens**
- Iridotomy be at least **200/500 μm in size**
- **Gonioscopy** is used to assess the anterior chamber angle and **AS-OCT**
- **Retroillumination direct and indirect**



Abraham +66 diopter
planoconvex button

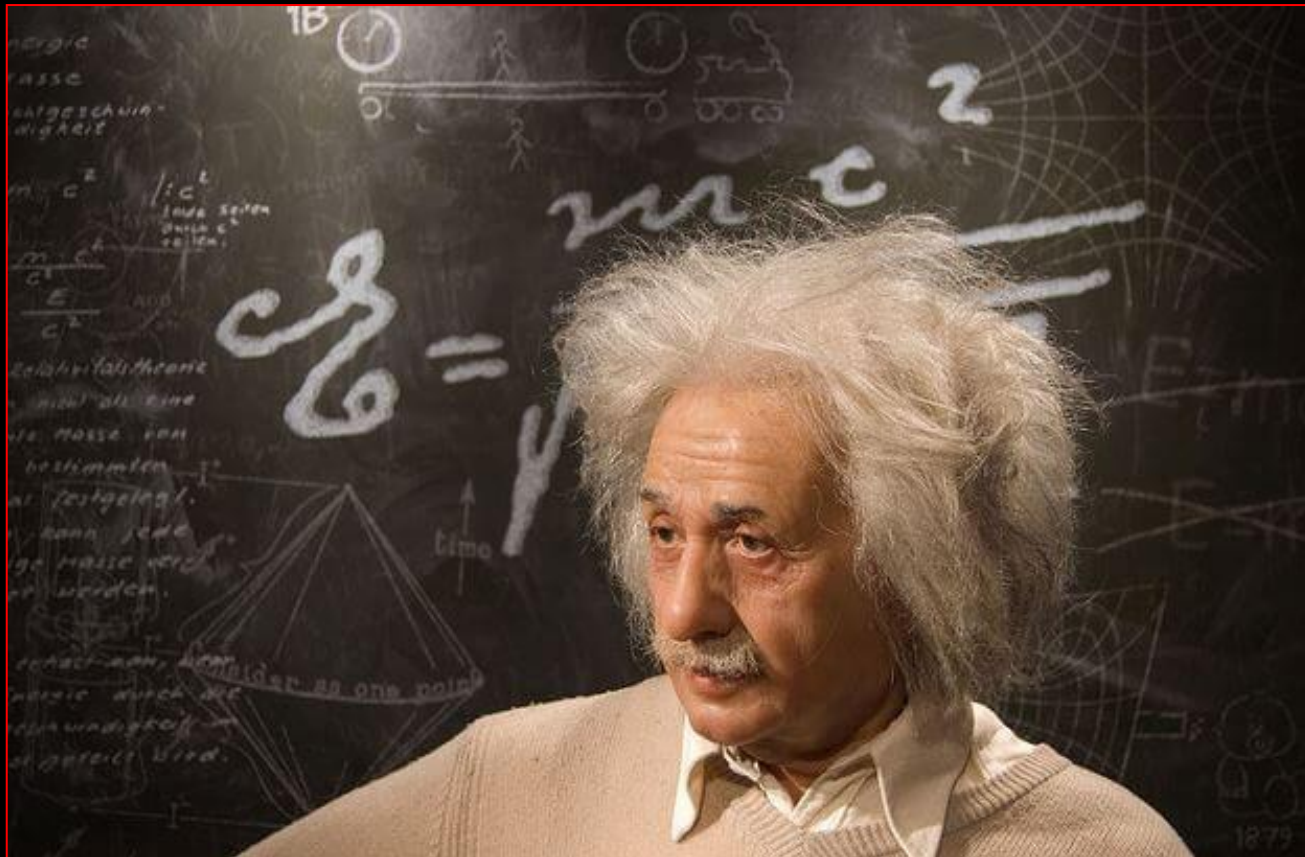
Technique

- The iridotomy site should be in the **peripheral third**
- A **crypt** or a thinned area of the iris is recommended
- Most ophthalmologists place the iridotomy between **11 o'clock and 1 o'clock**, where it is superiorly **covered** by the **lids**
- **Aberrations are less frequent a superior site**
- **In patients with blue or green irides**
LPI can be performed with a Nd:YAG laser, using the following settings: Power - 4-8 mJ, Pulses/burst - 1-3 (the author prefers 2), Spot size Fixed
- **In patients with dark brown irides**
First, the argon laser is employed to remove the anterior border of the iris, using the following settings: Power - 300-400 mW , Spot size - 50-100 mm, Duration - 0.05 seconds

Complications of Procedure

- Postoperative intraocular pressure **spike IOP** occurs it is usually in the first hour (as many as **70% of cases**) or, less commonly, in the second hour (as many as **40% of cases**)
- Anterior uveitis is usually mild and can be successfully treated with topical steroids
- Iris bleeding and hyphema (**50% of patients**)
- Corneal decompensation
- Closure of the iridotomy site is rare, especially when the Nd:YAG laser is used

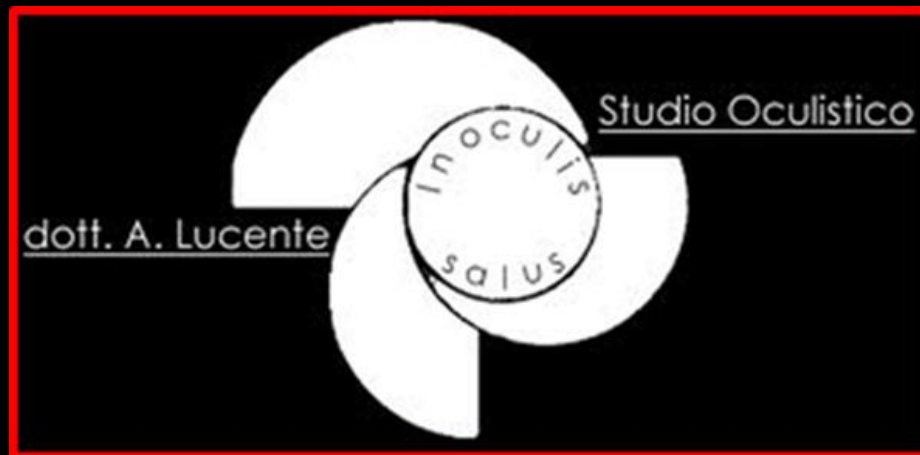
Albert Einstein (Ulma, 14 marzo 1879 – Princeton, 18 aprile 1955)



“Tutto dovrebbe essere reso il più semplice possibile, ma non più semplicistico”

A red rectangular box containing the handwritten signature of Albert Einstein in black ink.

Thanks for Your attention



Acireale, 8-10/10/15