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The recognition that the energy of sun could damage the human eye was a first step in the development of ocular phototherapy. Theodore Maimon built the first Laser (Light Amplification by Stimulated Emission of Radiation) which employed a ruby crystal as a medium in 1960. The laser emits a near parallel beam of coherent monochromatic linearly polarized light. In 1961 at New York University Milton Zaret launched the biomedical application of laser. However, the pioneer work in the development of an ophthalmic laser was done by L’Esperance in 1968 and followed by the studies of others. Today ophthalmology leads the world of medicine in terms of both laser and understanding of laser.

The electromagnetic spectrum of clinically useful laser is composed of a broad range of radiation including ultraviolet radiation (Excimer laser – 193 nm to 315 nm), visible light and infrared radiation (CO₂ laser). The clinically useful laser effects in biological tissues include
photochemical effects (photoradiation and photoablation), thermal effects (photocoagulation, photovaporization and photoablation) and ionizing effects (photodisruption). Photodisruption can be defined as the use of high peak power ionizing laser pulses to disrupt tissue. Short pulsed Nd:YAG laser can disrupt even transparent tissues by delivering enormous near infra-red (1064 nm) irradiances to target tissue. These irradiances are obtained by using small spot sizes and extremely brief pulse ranging from 30 ns to 20 ps.

The most widely employed laser medium to produce optical photodisruption is Nd-YAG (Neodymium:Yttrium-Aluminium-Garnet) laser with the major fundamental output at 1064 nm in the infrared range. One of the most frequent and most successful application of the photodisruptive property of Nd:YAG laser is laser posterior capsulotomy done in the treatment of opacified posterior capsules.

Since Ridley implanted the first intraocular lens in 1949, intraocular lens implantation is widely popular
visual rehabilitation following cataract extraction. The most common delayed complication of extracapsular cataract extraction or phacoemulsification, where posterior capsule of lens is preserved which permits a pocket for an IOL implantation, is posterior capsular opacification. Posterior capsular opacification occurs in about 18.4%-50% of cases, 3 months to 4 years postoperatively. It results from lens epithelial cells retained in the capsule following surgery which then proliferate, migrate and transform to myofibroblasts. It may manifest as Plaques Elschning's pearls, or capsular fibrosis. The patient typically presents with gradual diminution of vision or problems with glare after some duration of successful cataract extraction surgery. Thorough cortical clean up, atraumatic surgery so reducing the inflammation from excessive disruption of the blood aqueous barrier, wide anterior capsulotomy and/or removing the epithelial cells from the anterior capsular flaps may help to delay posterior capsular opacification. The presence of a PCIOL inhibits the proliferation of lens
epithelial cells by physical contact with the posterior capsule.

Before the advent of Nd:YAG laser the capsule had to be descissed either at the time of surgery or later, but its advent has revolutionized the management of PCO. Improvement in visual acuity is the primary aim of successful Nd:YAG laser posterior capsulotomy. The key to safe and successful laser capsulotomy is accurate focussing and using the minimal amount of energy and minimum number of shots required to puncture the capsule. An opening of about 4mm is usually adequate.

Complication which may result due to Nd:YAG capsulotomy are transient intraocular pressure rise (higher incidence in patients with pre-existing glaucoma, lack of PCIOL and myopia), damage/change in position of the IOL, iris trauma, cystoid macular oedema, retinal detachment (risk factors are myopia, history of RD in other eye, younger age and male sex) and endophthalmitis (propionibacterium acnes).