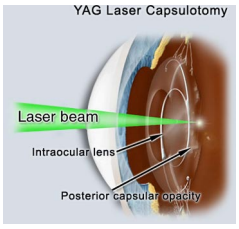
YAG Capsulotomy

Some time after cataract surgery, perhaps a few months or even years, a not uncommon development is clouding of the posterior capsule. The capsule is the membrane that surrounds the natural lens. During cataract surgery, this capsule has an opening made at the front (anterior surface), through which the cataract (lens material) is removed. Following this step, the intraocular lens (IOL) is placed inside this capsule (sometimes called a “bag”). The clouding used to occur in almost 50% of patients within 2 years of cataract surgery. Due to improvements in IOL design, the incidence is much lower, perhaps 15 to 25% of patients, and develops more slowly.

The reason this even happens is due to cells lining the inside of the capsule. During cataract surgery, virtually all of the lens material is removed. However, many lens cells remain as they’re microscopic and it is not possible to completely flush them out. The remaining lens cells do what they’re programmed to do: grow a new lens. Unfortunately, their attempt is not so well done as the lens structure they create no longer has parallel protein bundles but random deposition laid crisscross. The cells grow along the inner capsule surface, like ivy growing on latticework. The non-uniform protein they lay down is optically opaque, resulting in clouding of the capsule. The clouding is also known as a “secondary cataract” as it optically behaves like the original cataract, but is much more easily treated.

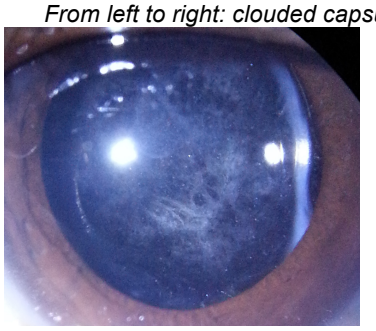
Until the 1980s, the cloudy membrane was opened using a knife. The name of the procedure for opening the membrane is called a *capsulotomy*. Using a knife to perform the capsulotomy carried the potential for many problems (chiefly, infection, bleeding, and displaced IOLs). After the YAG† (rhymes with “brag”) laser was developed for ophthalmology, the complication rate dropped dramatically. The YAG capsulotomy is now one the safest eye surgeries performed.

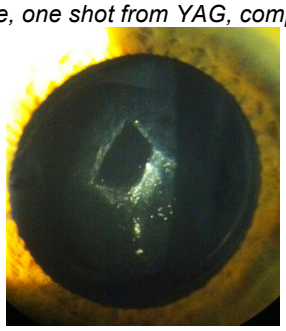


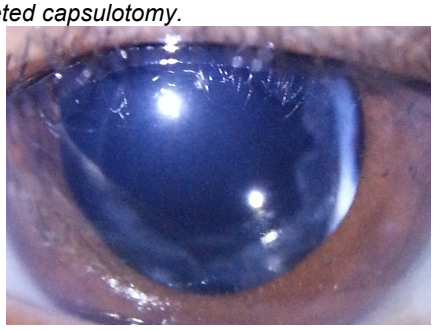
The YAG laser capsulotomy is done when the capsule becomes sufficiently cloudy (opaque) such that vision is decreased. Sometimes it can cloud rather rapidly, but usually it is a slow process, taking place over several months.

The YAG capsulotomy is a quick, painless procedure (there are no nerve fibers in the capsule to hurt). It is done in the office, after dilating the pupil. Dilation is necessary to better visualize the capsule. The YAG laser beam is invisible, so low-powered (safe), red lasers are focused in tandem with the invisible YAG beam to allow the surgeon to know where the laser is focused. The YAG laser is projected through a slit lamp that uses the white light of the slight lamp to visualize the capsule. So you will see a white light and small, red focusing beams. The procedure usually takes 2 or 3 minutes once everything is set up. After the procedure, the vision is almost immediately improved, being delayed by any dazzle from the white light and the dilation.

From left to right: clouded capsule, one shot from YAG, completed capsulotomy.







† Nd:YAG (Neodymium-doped Yttrium-Aluminum-Garnet crystal) laser; simply called a “YAG”.